

# When Brokers May Not Work: The Cultural Contingency of Social Capital in Chinese High-tech Firms

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In this paper, we bring structural holes theory to different cultural contexts by studying the effect of structural holes in four high-tech companies in China and assessing whether they confer the benefits to individuals occupying the brokering position in a career network that have been found in Western contexts. On the level of national culture, we propose that the typical collectivistic culture of China will dampen the effects of structural holes. On the organizational level, we propose that in organizations that foster a high-commitment culture—a culture that emphasizes mutual investment between people—the control benefits of structural holes are dissonant with the dominant spirit of cooperation, and the information benefits of structural holes cannot materialize due to the communal-sharing values in such organizations. Empirical results of network surveys confirm our hypotheses, and interview data add depth to our explanations. Brokers do not fit with the collectivistic values of China. Further, the more an organization possesses a clan-like, high-commitment culture, the more detrimental are structural holes for employees' career achievements such as salary or bonus, even after controlling for a host of other factors that may influence these career outcomes. In high commitment organizations, the "integrators" who bring people together to fill structural holes enjoy greater career benefits.●

An important insight of the social network perspective is that actions and outcomes can be predicted by the positions individuals occupy in a network of relationships. Social capital, as a metaphor, is the advantages individuals gain from being in certain types of social networks (Bourdieu, 1980; Coleman, 1988; Burt, 1992). One variant of the social network approach, structural holes theory (Burt, 1992, 1997, 2000), makes a strong case that an individual who connects two or more otherwise disconnected individuals (who have a structural hole between them) has more social capital than an individual who does not hold such a "brokering" position. Social capital as benefits that accrue to the brokers comes in two forms, information benefits and control benefits. Information benefits derive from the fact that the individual who bridges a structural hole has access to more nonredundant information and hence to more opportunities. Control benefits derive from the fact that the individual who bridges a structural hole decides whose interests to serve with those rewarding opportunities.

It is not clear, however, that such benefits can be realized under all conditions. Recently, scholars have issued some caveats and provided some empirical evidence on the boundaries of structural holes theory. For instance, evidence suggests that whether structural holes constitute social capital depends on the content of the network (Podolny and Baron, 1997). Structural holes create social capital in resource networks but not in identity networks, the conduits through which behavioral norms and role expectations flow (Ibarra and Smith-Lovin, 1997). Other contingent factors that moderate the effect of structural holes include the number of peers (Burt, 1997), organizational changes (Gargiulo and Benassi, 2000), the context and objectives of the network (Ahuja, 2000), and the time dimension of the network (Soda, Usai,

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and Zaheer, 2004). But thus far, empirical studies of social capital have largely been limited to the Western context of open markets, free competition, and individualistic orientation, a context that is the backbone of structural holes theory (Burt, Hogarth, and Michaud, 2000). How the mechanisms of social capital operate in other contexts with different cultural norms and market mechanisms remains largely unexplored. Scholars have studied the effect of culture on a few closely related phenomena, such as social loafing (Earley, 1989), cooperation (Chen, Chen, and Meindl, 1998), or opportunism (Chen, Peng, and Saporito, 2002). Findings suggest the potential constraining effects of culture on structural holes.

Culture operates not only on the national level but also on the organizational level (Schein, 1985; Martin, 1992; O'Reilly and Chatman, 1996). Research on social capital at the individual level often focuses on employees in a single organization (e.g., Burt, 1992; Podolny and Baron, 1997; Mehra, Kilduff, and Brass, 2001) or on a societal sample such as the alumni of a university (Siebert, Kraimer, and Liden, 2001). In both cases, the role of organizational culture as a boundary condition has been ignored in assessing the benefits of structural holes. Different kinds of organizational culture can affect whether brokers benefit or do not benefit from structural holes, particularly the culture of high-commitment organizations, which values cooperation rather than competition among employees. The concept of high-commitment organizations (Walton, 1985) has proved useful to scholars in the fields of industry and labor relations (Osterman, 1988; MacDuffie, 1995), human resources management (Huselid, 1995; Becker and Huselid, 1998; Baron and Kreps, 1999) and, more generally, organizational theory (Pfeffer, 1997). A common view across these fields is that the high-commitment organization uses a system of human resource management practices (such as employee participation, internal promotion, team rewards, profit sharing, extensive training and benefits, job security, and so on) that signal commitment to the employees, with the expectation that employees will commit to the organization in return. The benefits to individuals of structural holes are likely to be fewer in an organizational culture that values cooperation and rewards group performance.

Taking into account both national and organizational culture, the benefits of structural holes would be less likely realized in collectivistic national cultures and in organizations with a high level of commitment, which is the manifestation of collectivism at the organizational level (Earley, 1993; Chatman and Barsade, 1995; Chatman et al., 1998). A viable career advancement strategy in a collectivistic society, and particularly in a high-commitment organizational culture, should take into account the context's overwhelmingly cooperative nature. While brokers might thrive in the market and in organizations with market-like cultures, a collectivistic environment should reward those whose behaviors are consonant with the context's core values. We test these ideas using data from high-technology firms in China, a country with a heritage of strong collectivism (Earley, 1989, 1994; Chen, 1995) and a fertile ground for organization and management research (Peng et al., 2001; Leung and White, 2003; Tsui et

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al., 2004; March, 2005; Tsui, 2006). It provides an ideal context for examining the cultural boundaries of structural holes.

### EFFECTS OF CULTURE ON SOCIAL CAPITAL

#### Collectivist National Culture

Students of culture have relied on the concept of individualism vs. collectivism to describe an important distinction between cultures (Hui and Triandis, 1986; Triandis, 1989, 1995; Triandis and Gelfand, 1998). Triandis (1995) summarized the four defining attributes of individual-collectivism: (1) independent self vs. interdependent self, (2) individual goals or collective goals as priority, (3) relative importance of social norms vs. individual values and interests, and (4) emphasis on relationships vs. task accomplishment. The cultural consequences of collectivism in China have been documented in a wide range of phenomena, including decreasing social loafing in work groups (Earley, 1989), increasing the effects of self-efficacy training (Earley, 1994), affecting preferences in reward allocation (Chen, 1995), determining mechanisms of cooperation (Chen, Chen, and Meindl, 1998), decreasing propensity toward opportunism in intragroup transactions (Chen, Peng, and Saporito, 2002), avoiding adversarial arrangements in conflicts (Leung, 1987), deemphasizing economic gains in distributive negotiations (Liu, Friedman, and Chi, 2005), attributing successes to groups (Morris and Peng, 1994; Choi, Nisbett, and Norenzayan, 1999), and influencing the dynamics of decision making (Weber and Hsee, 2000; Weber, Ames, and Blais, 2005).

As Burt, Hogarth, and Michaud (2000: 124) noted, "The image of network entrepreneurs negotiating for advantages has a market flavor associated with the American economy." Based on the definition of individualism-collectivism (Triandis, 1995), it is not difficult to see that brokering around structural holes is individualistic to the extent that (1) it starts from the premise of an independent self, (2) it puts priority on individual goals rather than the collective's goals, (3) it focuses on fulfilling self-interest rather than accommodating social norms and obligations, and (4) it prioritizes task achievement above harmonious relationships. Accordingly, an individualistic culture is not only tolerant of this kind of brokering behavior, it actually encourages people to act in this fashion, as brokering behaviors are consonant with the liberal-individualistic values of independence and self-reliance.

Adler and Kwon (2002) made the same observation in their conceptualization of social capital. In structural holes theory (what they called the "bridging" view of social capital), social capital is seen as a resource that inheres in a focal actor's external network to give the actor advantages in his or her competitive rivalries. By contrast, network closure, or what Adler and Kwon called the "bonding" view of social capital (Coleman, 1988, 1990), focuses on the linkages among individuals or groups within a collectivity that "give the collectivity cohesiveness and thereby facilitate the pursuit of collective goals" (Adler and Kwon, 2002: 21). The focus on the welfare of the collectivity is paralleled by Putnam's (1993) and Fukuyama's (1995) conception of social capital as trust

and cooperative norms in communities and the society at large.

The individualistic undertone of structural holes theory is particularly clear with respect to the control function of structural holes. As Burt (1992: 34) described it, the person who occupies a structural hole position, the *tertius* (the third person, or the broker between two persons), "plays conflicting demands and preferences against one another and builds value from their disunion" and "broker[s] communication while displaying different beliefs and identities to each contact" (Burt, 2000: 354). This image of "self-seeking and ego-centric agents with little sense of obligation to others" stands in stark contrast to the self-restrained actor in a closed network, in which norms of reciprocity transform actors into "members of a community with shared interests, a common identity, and a commitment to the common good" (Alder and Kwon, 2002: 25).

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The concept most closely related to social capital in Chinese culture is *guanxi*, which points to the importance of trust, obligations, and reciprocity in Chinese people's social interactions: "*Guanxi* refers to instrumental-personal ties that range from strong personal loyalty to ceremonial bribery" (Walder, 1986: 19). It comprises particularistic ties in which instrumental and expressive-moral elements intertwine (Tsui and Farh, 1997). On the art of social relationships in China, Yang (1994) made a convincing case for the importance of *guanxi* in contemporary Chinese society. She defined *guanxi* as a condition that "involves the exchange of gifts, favors and banquets; the cultivation of personal relationships and networks of mutual dependence; and the manufacturing of obligation and indebtedness" (p. 6). Wank (1996) advanced similar arguments in observing that Chinese entrepreneurs typically rely on their *guanxi* to reach their patrons in the government to get market information, scarce resources, and protection when needed. Recently, Guthrie (1998) posited that, with the emergence of a rational-legal system to govern and guide business transactions, *guanxi* practices (using *guanxi* to get things done) should have declined, but according to the managers he surveyed for his study, the importance of *guanxi* relations has remained. In essence, in spite of recent efforts to build its legal infrastructure, China still has a society that relies largely on the informal relationships embedded in *guanxi*. Managers still consider *guanxi* or relationships in general to be an important part of the Chinese social fabric that effective managers cannot afford to ignore (Tsui, 1997; Y. Luo, 2000; J.-D. Luo, 2005).

Another related concept that sheds light on the nature of social exchanges in Chinese society is that of the in-group (Leung and Bond, 1984; Redding and Wong, 1986). People in a collectivistic culture form in-groups on the basis of characteristics such as kinship, hometown, common schooling, or work experiences. As the basic social fabric of collectivistic societies, in-groups are usually the permanent groups, in contrast to the temporary and flexible groups based on the common beliefs or shared interests of individualistic societies

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(Triandis, 1995). Large amounts of resources flow through these inner networks in the form of favors and return of favors (Walder, 1986; Yang, 1994). People who are on the margins of or are excluded from these networks of insiders are seriously disadvantaged.

In Chinese culture, to establish the right *guanxi* and be included in the in-group is crucial for career and business success or survival. People who stay at the boundary of two in-groups tend to be distrusted by both groups—both in-groups are likely to regard them as out-group members who do not deserve in-group treatment. Spanning structural holes, as a Chinese saying has it, is like standing on two boats, which is one of the most socially disparaged behaviors and subject to heavy social sanctions. Simple and dense networks that represent clear group membership, rather than networks full of structural holes, constitute resources for social actors. These arguments suggest that in a collectivistic culture such as China's, it is network closure (Coleman, 1988, 1990), rather than structural holes, that creates social capital. In the organizational setting, this suggests that employees with many structural holes in their networks might not be able to achieve good career performance as evidenced by salary level or bonus awards. Thus, controlling for other factors influencing career performance, we hypothesize that:

**Hypothesis 1 (H1):** Structural holes will be negatively related to an employee's career performance in organizations located in a collectivistic culture (China).

The facilitative effect of structural holes has been found at the individual level in some organizations (Burt, 1992, 1997) but not in others (Podolny and Baron, 1997). As Podolny and Baron pointed out, one reason for this finding lies in organizational differences. For instance, though structural holes may be "most beneficial in traditional bureaucratic firms," they might be less so in "strong culture organizations where a sense of belonging and a clear organizational identity may be crucial" (Podolny and Baron, 1997: 690). One type of "strong culture" organization in which social capital may play out differently is the high-commitment organization.

### High-Commitment Organizational Culture

In recent years, research on strong-culture organizations has converged on the concept of so-called high-commitment organizations, i.e., organizations that implement a system of work practices that aims at eliciting employees' commitment to the organization (Walton, 1985; Pfeffer, 1997; Baron and Kreps, 1999). Scholars have consistently documented the positive relationship between such a high-commitment culture and organizational performance (e.g., Arthur, 1994; Huselid, 1995; Youndt et al., 1996; Appelbaum et al., 2000; Guthrie, 2001). The high-commitment concept also underlies employment relationships. Tsui and colleagues (1995, 1997) noted two basic employment approaches: the quasi spot-contract (or job-focused) approach and the mutual-investment (or organization-focused) approach. The quasi spot-contract approach is based on a purely economic-exchange model. By empowering employers to hire and fire employees with rela-

tive freedom, this approach is an attempt to create a market-like flexibility. The mutual-investment approach is based on a model that combines economic and social exchanges. While the terms of economic exchanges are specified and closed, social exchanges create obligations that are unspecified and open-ended among the exchange parties and are imbued with a strong sense of trust and reciprocity. By encouraging employees to take extra-role responsibilities in return for employment security, the mutual-investment approach is an attempt to create a clan-like flexibility (Ouchi, 1981). In the human resources management literature, Delery and Doty (1996) distinguished an internal-type employment system from a market-type employment system. The internal type emphasizes long-term relationships with employees and hence is akin to the mutual-investment approach. In contrast, the market type operates on the basis of quasi spot contracts. The fundamental difference between these two kinds of organizations is consistent with the distinctions in earlier theoretical work, such as Blau's (1964) distinction between economic exchanges and social exchanges and Etzioni's (1961) distinction between utilitarian involvement and normative involvement.

Organizations differ in the degree of commitment offered to and expected from employees. At the two ends of the spectrum are clan-like, high-commitment organizations and market-like, low-commitment organizations, with different organizing principles. Whereas low-commitment organizations are based on formal contracts not unlike those found between organizations in the market, in high-commitment organizations, there is a great amount of trust between the employer and the employee. While low-commitment organizations resemble the market in their transaction approach to handling the organization-employee relationship, high-commitment organizations operate more like a clan, with strong norms of cooperation. This fundamental difference might have important implications for the effect of structural holes theory in the organization. If structural holes constitute social capital for organizational members, they should have a different utility in the market-like, low-commitment organizations than they do in the clan-like, high-commitment organizations.

**Structural holes in high-commitment organizations.** The level of commitment has a direct impact on how organization members act and interact. In high-commitment organizations, there is usually wide information sharing, participation in decision making, and egalitarianism in both words and deeds (Baron and Kreps, 1999). Various socialization mechanisms such as social gatherings, employee clubs, and ceremonies promote identification with the organization (Watson and Petre, 1990; Packard, 1995). There is an atmosphere of trust between management and employees, but there are also strong norms and peer pressure to invest high levels of effort and achieve high performance (Kreps, 1990; Miller, 1992). The behavior of employees is controlled through culture and role expectations rather than through detailed items in their job descriptions (Schein, 1985; Van Maanen and Kunda, 1989). Performance is often measured at the team, department, or even the firm level. Employees are expected to help

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each other in problem solving, to meet the requirements of a variety of unforeseen contingencies, and are subject to strong norms and effective social sanctions inside the organization.

The image of a high-commitment organization as a cohesive group is consistent with Coleman's (1988, 1990) thesis on social capital, in which obligations, trust, and the effective sanction of uncooperative behaviors are the central mechanisms. Brokers are less likely to play a central role in these high-commitment organizations. First, the effects of a typical high-commitment work environment, characterized by employment security, hiring from within, and heavy socialization outside work, are all means to provide network closure. Second, as a result of the employees' strong identification with the organization and with each other (March and Simon, 1958; Ashforth and Mael, 1989), people in different parts of the organization can develop spontaneous collaborative relationships because of their common identity. Further, employees themselves are expected to fill structural holes in high-commitment organizations. If there are disconnections between groups, cliques, and departments, the cooperative norms prescribe that these disconnected parties be directly brought together immediately, rather than have a broker stand between the parties to control the opportunities for them to interact. In other words, structural holes are quickly filled once they appear. Employees find solutions and solve problems communally in the interest of the organization, in line with its high-commitment values.

Further analysis of the information benefits and control benefits of structural holes sheds more light on the limitations of brokerage in high-commitment organizations. Brass, Butterfield, and Skaggs (1998), in their research on unethical behaviors, pointed out that, other things being equal, structural holes will bring more opportunities for malpractice. This is also evident in Burt's (2000: 354) argument that the purpose of controlling behaviors is to ensure that the broker has a "disproportionate say in whose interests are served." To that end, "accurate, ambiguous, or distorted information is strategically moved between contacts by the *tertius*" (Burt, 2000: 355). Through these controlling behaviors, the interests of the *tertius* rather than those of the collectivity are enhanced, sometimes at the expense of the organization as a whole. Though this kind of manipulation might be tolerated or common in market-like organizations, it is often viewed as a source of political infighting and a symptom of mismanagement in high-commitment organizations. Its self-seeking nature runs counter to the value of selflessness and enthusiastic pursuit of the common interests of the organization. Furthermore, because the network is dense, people who profit from controlling opportunities in high-commitment organizations are more likely to be discovered and sanctioned by their colleagues for doing so. Therefore, the control benefits of structural holes will be attenuated in high-commitment organizations.

Although the control benefits of structural holes will be restricted for the reasons we discussed above, the information benefits of structural holes might not disappear entirely.

In large organizations, especially in multinational and multi-business firms, lack of coordination across internal boundaries is a perennial problem (e.g., Kogut and Zander, 1992; Ghoshal, Korine, and Szulanski, 1994). Hence, achieving consummate communication between subunits can be problematic, which is documented by a stream of research on the optimal network configuration for knowledge transfer inside firms (e.g., Tsai, 2001, 2002; Reagans and McEvily, 2003; Oh, Chung, and Labianca, 2004). In this sense, no firm can entirely avoid cliques inside the organization. It still needs some employees to undertake the valuable tasks of bridging information and resource flows between otherwise unconnected silos inside the organization. Employees who span those boundaries are valuable to the organization and should be rewarded by the organization for doing so. But generating value is not equivalent to appropriating that value (Blyler and Coff, 2003; Ahuja, Coff, and Lee, 2005). Being a broker is one thing, but getting rewarded for being a broker is another. Saying that the information benefits for the organization of structural holes do not disappear is not equivalent to saying that employees who act as brokers will actually be able to reap advantages from their positions and perform better than their peers. Given the communal-type values of the high-commitment organization, the benefits of structural holes tend to be shared by all the people around the holes, and brokers might not be able to enjoy the information benefits of their bridging behaviors to the extent that they could in market-like organizations.

Further, because high-commitment organizations are one kind of collectivism, the tendency to share information benefits in high-commitment organizations is reinforced by a cognitive mechanism. Collectivists are more likely to attribute successes to the group than to individuals (Morris and Peng, 1994; Menon et al., 1999), and thus colleagues do not necessarily perceive the contributions of the broker as belonging to the individual. Whereas individualists tend to attribute the agent role to individuals and hence perceive a large share of the pie as the broker's contribution, collectivists are apt to perceive a smaller share as the contribution of the broker. Because of the collectivistic culture of high-commitment organizations, affecting both values and cognitions, brokers will not be able to fully realize the information benefits of structural holes in their career performance in these organizations.

Structural holes as a source of social capital for employees are thus limited in high-commitment organizations in two ways. First, the control benefits of structural holes are limited because of the effective sanction mechanisms in high-commitment organizations. Second, even when the bridging function of structural holes adds value to the individual, the communal-sharing values and attributions for behaviors in such organizations prevent the broker from appropriating this value. While the sanction mechanism limits the broker's capacity to extract personal value beyond his or her "fair share," the attribution mechanism limits the broker's ability to realize the value he or she creates. These two aspects in combination minimize the comparative advantage of structur-

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al holes in high-commitment organizations as opposed to those in more market-like organizations. Further, to the extent that the sanction mechanism will effectively punish controlling behaviors, structural holes potentially even bring disadvantages to brokers, which will have implications for an employee's career performance in high-commitment organizations:

**Hypothesis 2 (H2):** Organizational culture will moderate the relationship between structural holes and an employee's career performance such that structural holes will be more negatively related to career performance in high-commitment organizations than in low-commitment organizations.

## **METHODS**

### **Empirical Setting**

We conducted the study in China's information technology (IT) industry, one of the major forces in the country's economy. It is among the largest export industries of China, producing 28 percent of the total exports of the country (Ministry of the Information Industry, 2003). Foreign direct investment is the driving engine of the industry, as foreign investment companies account for 68 percent of the revenue and 64 percent of the profits, though local Chinese companies also have very strong holdings in the industry due to their intimate knowledge of the local market. In recent years, by pouring resources into research and development (R&D) and recruiting a large number of graduates from engineering schools, local companies have begun to catch up with their multinational competitors in technological competence. It is a highly competitive industry, full of innovation, uncertainty, and rapid change. The hyper-competition creates a high level of interdependence inside organizations and brings the "soft stuff," such as a high-commitment culture, up front as an important competitive advantage for companies (Burt et al., 1994; Burt, 1999). Studying high-tech companies also facilitates comparisons of our results with those of prior major research conducted in this industry (e.g., Burt, 1992; Podolny and Baron, 1997; Mehra, Kilduff, and Brass, 2001).

### **Procedure**

We first went to six industry experts for suggestions of companies to study. Three were senior editors from a leading IT magazine in China that covers current issues in the country's IT industry and has extensive connections to its major companies. The other three were executive-search consultants from a leading global executive-search company that specializes in serving the rapidly growing IT industry in China. Because executive search is based on information and connections, those consultants were well informed about the industry and were able to provide information about major IT companies from the perspective of industry insiders.

Our sampling frame included companies in computer hardware, software, telecommunications, and Internet equipment providers that employed more than 1,000 salaried or professional employees. We included both multinational and local Chinese companies. We provided the industry experts with a list of major IT companies to help them recall the names of

the companies. We also gave them a list of high-commitment work practices that they could use as guides to name companies that vary on this dimension. We asked them to nominate a set of high-commitment and another set of low-commitment companies to ensure that we had variance on this variable.

The next step was to persuade the nominated companies to participate in the studies. In the next six months, we approached sixteen companies through various channels and gained access to four companies. They are a leading Chinese software producer (hereafter referred to as Software), a leading Chinese hardware producer (hereafter referred to as Hardware), a multinational telecommunications equipment producer (hereafter referred to as Telecom), and a multinational wireless and mobile equipment producer (hereafter referred to as Mobile). Table 1 offers a brief description of the four organizations. The descriptions suggest that we achieved some variance on potential differences in commitment among these four companies: Hardware is clearly a high-commitment and Software clearly a low-commitment company; Mobile and Telecom are somewhere in between.

We collected data from Software and Hardware in October and November 2002. We asked the two companies for a random sampling of 200 to 300 salaried employees and invited these employees to participate in our network survey. We first created random numbers between one and the size of the population and then picked out those employees corresponding to the random numbers. At Software, 200 of about 1,000 employees (20 percent) at the headquarters were sampled. At Hardware, 300 of about 4,000 employees (7.5 percent) at the headquarters were sampled. The human resources (HR) director sent a letter to all these employees, inviting them to participate in a study on their career networks. The questionnaire was not anonymous, but the social desirability problem (Arnold and Feldman, 1981) was alleviated by using the following measures: (1) respondents did not need to use the real names of their contacts, and (2) we promised that we would keep all individual responses completely confidential and that we would conduct our analyses only at the aggregate level. We asked the company to send two rounds of e-mail reminders to the employees approximately two and four weeks after the first invitation. From Software we received 88 completed questionnaires, a response rate of 44 percent. From Hardware we received 117 questionnaires, a response rate of 39 percent. In both cases, if the questionnaire had missing data points, we e-mailed, called, or met with the respondents to fill in the missing information.

We interviewed the HR executives on key HR policies and HR indicators of the companies. We also conducted in-depth interviews with fourteen managers, seven from each company. The theme was "how social networks influence career development." The interviews typically lasted for about ninety minutes but ranged from one to over two hours. We took handwritten notes but also tape-recorded and transcribed most of the interviews verbatim.

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Table 1

<b>Descriptions of the Four Organizations</b>				
	Hardware	Software	Mobile	Telecom
Description	Founded by a group of scientists from a national research institute in 1984; the largest PC maker in China and one of the most respected local companies.	The leading producer of accounting and enterprise resource planning (ERP) software in China.	A cumulative investment of USD 5 billion; known as the largest foreign investment in China.	First multinational company in this industry in China; the powerhouse of telecommunications technology worldwide for several decades.
Size	Revenue: USD 4 billion; 16,000 employees.	Revenue: USD 121 million (second only to Microsoft in the national ranking of software sales); 4,000 employees.	Revenue: USD 5.7 billion in China; 12,000 employees.	Revenue: USD 1.2 billion in China; 3,000 employees.
Leadership style	The current CEO, 36 years old, took over leadership from the founder 2 years earlier and is a strong advocate of egalitarianism.	The founder is an iconic entrepreneur in China, famous for his low-key, pragmatic style.	Strong commitment to the Chinese market.	An integrated part of the global network.
Human resources	Promotion from within; careful selection procedures; extensive training and socialization; extensive shared ownership.	The founder owns 55 percent of the company and recently hired an American Chinese as CEO with an astonishing salary of RMB 5 million.	A preferred employer in China; good compensation, quality work environment, extensive training, but the market pressure from strong local competitors is also accumulating.	Good development plan for engineers, although the expenses for training and overseas trips (mostly to the U.S.) have been cut recently.
Surroundings and atmosphere	In a huge glass-and-steel headquarters full of sunlight, the atmosphere is open, genial, and pleasant, if not cheerful.	Senior managers have large private offices. Rank-and-file employees sit in small cubicles, enclosed by high dividers and a low ceiling.	The workplace is spacious, quiet, clean, and full of green plants. But there is also a sense of entitlement, referred as the "Iron Rice Bowl of Capitalism."	Technology and science focused, down-to-earth approach, proud to be in the center of telecommunication innovation.

We collected data on career performance six months later. Software's annual performance review occurred in January and February 2003, and we collected the performance data from the HR department in March. For Hardware, whose financial year 2002 ended in March 2003, the performance data came out in April 2003, and we collected them in May.

We replicated the data-collection procedure at Telecom and Mobile in March and April 2003. At Mobile, 300 of about 1,500 employees (20 percent) who worked at the headquarters were sampled. At Telecom, the study was conducted within the R&D division, which had 407 engineers and managers. In this case, it was not a random sample—invitations were sent to all employees in the division. At Mobile, we collected 102 questionnaires, a response rate of 34 percent. At Telecom, we collected 128 questionnaires, a response rate of 31 percent.

We interviewed the HR executive (one for each company) and nine managers (two at Telecom and seven at Mobile) during the same period. We collected the career-performance data of all participants in the study for the year March 2002

to March 2003. Hence, for these two companies, there was no time lag in the career-performance data, though, as explained below, we took measures to ensure that the network data preceded the career-performance data in these two companies.

We collected a total of 435 questionnaires from the four companies. Excluding 18 incomplete surveys, 417 questionnaires were used in the final analyses. Of the 417 respondents, 26 percent were managers with responsibility for people or projects, and the rest were individual contributors who did not have any employees reporting directly to them. In terms of functional background, 74 percent were in engineering jobs; 12 percent in sales, marketing, and public relations jobs; 8 percent in administrative jobs; and 6 percent in other jobs. Of all the respondents, 63 percent were male. A large proportion, 92 percent of the respondents, had a bachelor's or higher degree. Their average age was 29, and their average tenure with the organization was three years. The demographic profiles of the participants in the four companies were generally similar. The average age ranged from 28 to 32 years, company tenure ranged from two to four years, the majority were males (57–76 percent), 80–99 percent had a bachelor's degree or higher, most held an engineering degree (59–97 percent), and the majority of them were in non-management positions (55–92 percent). We controlled for the demographic differences in the hypothesis-testing analyses.

Finally, from the HR department we collected the basic demographic information on all the invited employees for a response-bias analysis using Probit (the dependent variable is a dummy: 1 = response; 0 = no response). Results showed that the probability of an employee's responding did not relate to his or her gender, age, education, experience, seniority, or organizational rank in any of the four organizations. We were also able to collect information on the employee's job function from two of the four companies and found no significant differences in the distribution of functions in the respondent sample and the employee population of the companies.

### **Controlling for Reverse Causality**

Research has shown that people are remarkably accurate in recalling typical interactions and long-term relationships (Freeman, Romney, and Freeman, 1987). Still, because any ego-centered network is based on retrospective recall, the causal direction of any event is a key issue, so we needed to take steps to assure that career performance was not affecting the network data. Burt (1992) did not control for this problem in his research design. Brass (1984) collected performance data (promotion) three years after collecting his network data. In Burt's study (1997) of the investment banker's bonus, there was also a six-month time difference between collecting the network and performance data. Podolny and Baron (1997) excluded the direct ties that existed in the time window in which they collected performance data (shifts in job grades). We used two measures to alleviate this problem.

For Software and Hardware, we conducted the network survey in October 2002 and waited for about half a year to col-

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lect the performance data, after the annual performance review. In other words, we used network information at  $t_1$  and tested its influence on performance at  $t_2$ . Although six months is not long enough to observe the more long-term career changes such as promotion and turnover, it is pertinent for the performance variables we used in the current study (salary, bonus, and satisfaction). For Telecom and Mobile, for which there was no time lag, we asked the respondents not only when they got to know their contacts (whether they had known their contacts for more than one year) but also when their contacts got to know each other (whether they had known each other for more than one year). After obtaining this information, we included in the study only those network linkages that existed before the time window for which we collected the career-performance data. We excluded not only ego-alter linkages that did not exist before the dependent variables we measured but also alter-alter linkages that did not exist beforehand.<sup>1</sup>

### Measures

**Structural holes.** We collected data on ego-centered networks from the employees by first asking the respondent (ego) to list the names of the individuals within that person's career networks (alters) and then asking the respondent for information on the strength of all ego-alter ties and alter-alter ties in the network. It is important to note that ego-centered network data are the perceived network rather than the actual network (Krackhardt, 1987) and that ego-centered network data can be subject to possible biases such as perceived balance (Krackhardt and Kilduff, 1999), i.e., the bias toward strong ties (hence the tendency to underreport weak ties). Because these biases, if they existed, would operate the same way across all respondents, however, they should not have affected our outcome for interpersonal comparisons. Further, it was important that we use the same method as Burt (1992) and Podolny and Baron (1997), which renders cross-study comparison possible.

To maximize comparability across studies, we adopted the name-generator procedures of Burt (1992) and Podolny and Baron (1997). The first name generator was a question about career development. Respondents could give a maximum of five names. In addition, we asked about mentors (2nd), task advice (3rd), strategic information (4th), uncooperative people (5th), buy-ins (6th), political aid (7th), and social support (8th). For each question, the respondent could provide up to three names. The last two items were formal relationships, which are an important part of employees' career networks: the superior (9th) and the superior of the superior (10th). For these two networks, we asked the respondent to give one name for each, if appropriate. About 72 percent of the respondents included the superior of the superior as a member of their networks.

We combined the names generated by the 10 name generators to assemble the career network of the respondent. The strength of relationship was measured by 0–3 (0 = Distant: a person you don't know or don't like, would avoid seeing; 1 = Less close: the person is OK to get along with, but no person-

<sup>1</sup> We also tested the models without dropping the ties of less than one year. The results were essentially the same.

al bond; 2 = Close: a person you get along with well, but no strong personal bond; 3 = Very close: strong personal bond). We used Burt's (1992) constraint (c) to measure *structural holes*. In an ego-centered network, the extent to which an alter, j, constrains the ego, i, is a multiplication of (a) i's investment in j, and (b) the lack of structural holes around j, i.e.,

$$c_{ij} = (p_{ij} + \sum_{q \neq i, j} p_{iq} p_{qj})^2,$$

where  $p_{ij}$  is the proportion of i's relations invested in contact j and  $\sum_{q \neq i, j} p_{iq} p_{qj}$  is the portion of i's relations invested in contact q who are in turn invested in contact j.

Summed over all the alters,  $\sum_j c_{ij}$  is the network constraint measure. It is a function of the network's size, density, and hierarchy (networks in which all contacts are exclusively tied to a dominant contact) and is designed to measure the extent to which the focal actor's network lacks structural holes. The higher the actor's constraint score, the fewer structural holes exist in his or her network. Because constraint has a range between 0 and 1, to facilitate interpretation, we used  $1 - \text{constraint}$  to directly measure the number of structural holes. We used UCINET 6 (Borgatti, Everett, and Freeman, 2002) to compute this measure.

**Career performance.** Career performance includes the current monthly *salary* and *bonus*. Salary is a widely used measure of career success in the literature (e.g., Burt, Hogarth, and Michaud, 2000; Siebert, Kraimer, and Liden, 2001). To the extent that employees' network patterns are developed throughout their entire career history and are relatively consistent over time (Burt, Jannotta, and Mahoney, 1998), salary captures the long-term accumulation of social capital effects and hence is a pertinent measure of an employee's career performance. The bonus during the one-year window is a direct measure of the employee's career performance in the period (Burt, 1997). We standardized these two variables within each company to represent an employee's career performance relative to his or her colleagues (Burt, 1992, 1997).

In addition, using items on the employee questionnaire, we measured *job satisfaction*, the subjective aspect of career success ("To what extent are you satisfied with this job?") on a Likert scale with a 1–7 response. Because the survey was long and we wanted to avoid tiring respondents, we chose to use a single-item measure of job satisfaction, given that organization researchers have found that single-item measures of job satisfaction are as robust as multiple-item measures (Scarpello and Campbell, 1983; Gerhart, 1987; Trevor, 2001).

**High commitment.** Based on the literature, we identified fifteen items to measure high-commitment organization (Delery and Doty, 1996; Youndt et al., 1996; Pfeffer, 1997; Baron and Kreps, 1999). We performed principal component factor analysis and used Kaiser's criterion (eigenvalue of greater than 1) to define the number of factors to retain. Table 2 shows the results. Based on Kaiser's criteria, five factors emerged to account for 61 percent of the total variance.

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Table 2

<b>Results of Factor Analysis of Organization's Commitment to Employee Items</b>					
Item	1	2	3	4	5
1. Promotion from within rather than from outside				.56	
2. Careful selection procedures in recruiting	.66				
3. Extensive training and socialization	.62				
4. Hesitation to fire employees		.77			
5. Expanded jobs and job rotation	.57				
6. Appraisal of team performance rather than individual performance	.49				
7. Behavior-oriented appraisal rather than result-oriented appraisal		.77			
8. Feedback for development purposes rather than for evaluation	.55				
9. Good remuneration (including compensation and fringe benefits)				-.50	
10. Extensive ownership of shares, options, or profit sharing	.50				
11. Promotion of egalitarianism in income, status, and culture	.58				
12. Participation in the form of suggestion, grievance systems, and morale survey	.72				
13. Open communication and wide information sharing	.71				
14. Emphasis on strong, overarching goals			-.67		
15. Work in teams; successes of teams rather than individuals are hailed	.55				
Eigenvalue	4.15	1.70	1.17	1.13	1.01
Percentage of variance explained	.28	.11	.08	.08	.07
Alpha coefficient	.81				

Ten of the fifteen items loaded on factor 1 (accounting for 28 percent of the variance), and this was the only interpretable factor. Therefore, we used these ten items to form a scale that measured the organization's commitment to the employees as perceived by the employees. The Cronbach's alpha for this scale was .81. We estimated the within-group agreement on this measure among the respondents in each company. The rwg value (James, Demaree, and Wolf, 1983) is .85 for Software, .83 for Hardware, .83 for Telecom, and .84 for Mobile. The ICC(1) (James, 1982) and ICC(2) (Klein and Kozlowski, 2000) are .14 and .95, respectively, both indicating a good within-group (within-company) interrater reliability. Of the two Chinese companies, Hardware had a higher commitment level than Software ( $F = 59.8, p < .001$ ). Of the two multinational companies, Telecom had a higher commitment level than Mobile ( $F = 5.33, p < .05$ ).

**Control variables.** We controlled for a number of factors that might be associated with the career performance of employees, including the demographic variables of *age* (in years), *gender* (dummy variable, 1 for male), and *education* (1 for high school, 2 for some years of college, 3 for a bachelor's degree, 4 for a master's degree, 5 for a doctoral degree). We controlled for the work experience of the employees by the *number of companies worked for* before the employee joined the current company. We also controlled for company-specific experience, including *company tenure*, the number of years the employee had worked for the company, and *job tenure*, the length of time the employee had been in the current position. We used dummy variables to control for organizational rank and the job function of the employee: *manager 1* (junior manager), *manager 2* (middle manager), *manager 3* (senior manager), *sales* (sales, marketing, and public relations jobs), *technical* (various engineering jobs), and *administrative* (HR, finance, and general management jobs). Non-managerial employees and employees holding other kinds of jobs were the reference groups in the two dummy-coded measures of rank and job function. Last, to ensure that the employee's rat-

ing of the organization's commitment to the employees was not an attribution bias of the employee's commitment to the organization, we controlled for the employee's *affective commitment* to the organization. We used the five-item scale reported in Tsui et al. (1997). A confirmatory factor analysis of the scale showed good psychometric properties, with a CFI of .97, an RMSR of .05, and a coefficient alpha of .81.

## RESULTS

The average number of names from each of the networks was 3.9 for career discussion (1st), 1.6 for mentors (2nd), 2.1 for task advice (3rd), 1.8 for strategic information (4th), .48 for uncooperative people (5th), 2.2 for buy-ins (6th), 1.6 for political aid (7th), 2.1 for social support (8th), 1.0 for the superior (9th), and .93 for the superior of the superior (10th). These ten name generators produced a career network for the respondent comprising, on average, 9.4 contacts that ranged from 3 to 19.

Table 3

Descriptive Statistics and Correlation Matrix*													
Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11
1. Age	29	4.3											
2. Gender	.63	.48	-.01										
3. Education	3.4	.73	.15	.07									
4. No. of companies worked for	1.5	1.4	.36	-.01	-.29								
5. Company tenure	3.0	2.3	.60	-.12	-.08	.04							
6. Job tenure	1.8	1.4	.32	-.13	.04	-.01	.48						
7. Technical	.74	.44	-.12	.17	.25	-.19	-.18	-.00					
8. Sales	.12	.33	.12	-.11	-.17	.16	.17	.00	-.62				
9. Administrative	.08	.27	.03	-.10	-.13	.07	.03	-.06	-.50	-.11			
10. Other functions	.06	.24	.01	-.04	-.10	.05	.06	.07	-.42	-.09	-.08		
11. Manager 1	.09	.28	.16	-.03	-.03	.07	.28	-.02	-.16	.20	.00	.03	
12. Manager 2	.04	.19	.18	.04	-.00	.05	.13	-.01	-.06	-.03	.08	.06	-.06
13. Manager 3	.02	.14	.15	.11	.07	.00	.16	-.03	-.04	.00	.02	.04	-.04
14. Non-managerial	.85	.35	-.28	-.04	-.00	-.08	-.36	.04	.18	-.14	-.06	-.07	-.76
15. Hardware <sup>†</sup>	.27	.44	-.20	.01	-.30	-.08	-.07	-.26	-.20	.00	.23	.10	.06
16. Software <sup>†</sup>	.21	.41	-.14	.13	-.23	.21	-.18	-.08	.04	.04	-.11	-.00	-.03
17. Mobile <sup>†</sup>	.24	.45	.36	-.07	-.04	.20	.29	.14	-.19	.20	-.00	.07	.15
18. Telecom <sup>†</sup>	.29	.43	-.02	-.06	.54	-.30	-.04	.20	.34	-.24	-.13	-.16	-.18
19. High commitment	4.1	.87	-.07	.06	-.05	-.11	.02	-.10	-.04	.04	.04	-.02	.03
20. Structural holes	.66	.11	-.02	.03	.02	-.01	-.09	-.03	.01	.03	-.05	-.01	-.02
21. Salary <sup>‡</sup>	0	1	.43	.12	.26	.07	.38	.08	-.04	-.00	.01	.06	.21
22. Bonus <sup>‡</sup>	0	1	.22	.05	.10	.02	.27	.12	-.03	-.03	.03	.05	.07
23. Satisfaction	4.6	1.1	.01	.10	-.07	.04	-.01	-.14	-.07	.05	.07	-.01	.11
24. Affective commitment	5.5	.91	.09	.09	-.12	.06	.05	-.18	-.09	.07	.13	-.08	.13
Variable	12	13	14	15	16	17	18	19	20	21	22	23	24
13. Manager 3	-.03												
14. Non-managerial	-.46	-.34											
15. Hardware <sup>†</sup>	.12	.11	-.16										
16. Software <sup>†</sup>	.03	-.03	.02	-.31									
17. Mobile <sup>†</sup>	-.08	.00	-.08	-.34	-.29								
18. Telecom <sup>†</sup>	-.07	-.09	.21	-.38	-.32	-.35							
19. High commitment	.04	.09	-.08	.30	-.27	-.11	.06						
20. Structural holes	-.05	-.01	.05	-.15	.01	.05	.09	.01					
21. Salary <sup>‡</sup>	.49	.45	-.61	.01	.00	.00	-.01	.06	-.16				
22. Bonus <sup>‡</sup>	.40	.34	-.40	.01	.00	.00	-.01	.04	-.21	.70			
23. Satisfaction	.13	.08	-.19	.10	.08	-.01	-.16	.43	-.05	.10	.08		
24. Affective commitment	.11	.12	-.21	.19	.01	.00	-.20	.50	.02	.08	.08	.66	

\* For all correlations > .17,  $p < .001$ ; > .13,  $p < .01$ ; > .10,  $p < .05$ ; > .08,  $p < .10$ .

† Organization dummies are included to show cross-organization differences.

‡ Standardized within the companies.

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Table 3 presents the descriptive statistics. We found no relationship between structural holes and the employee's age, gender, education, length of work experience, number of companies worked for, tenure in the current position, organizational rank, and job function. They were only marginally associated with seniority or company tenure ( $-.09, p < .10$ ), which means that the longer the employee had worked in the company, the more constrained his or her network tended to be. This is intuitive, as longer-tenured employees would have more opportunities to socialize with colleagues and to have denser networks.

H1 predicted a negative relationship between structural holes and career performance for the entire sample. The results in table 4 show that constraint is a good predictor of salary; in model 1, the coefficient for structural holes is negative and highly significant. The more structural holes in employees' networks, the lower are their salaries compared with those of their colleagues. Structural holes also predict bonus; the coefficient for structural holes in the bonus model, model 2, is also negative and highly significant. The more structural holes in employees' networks, the lower are their bonuses in this period compared with those of their colleagues. The

Table 4

### Effects of Structural Holes on Career Performance (N = 417)\*

Predictor	Salary Model 1	Bonus Model 2	Job satisfaction Model 3
Constant	-1.559*** (.306)	.326 (.422)	4.987*** (.574)
Age	.019 (.010)	-.005 (.014)	.006 (.019)
Gender	.133* (.061)	.053 (.085)	.189 (.115)
Education	.348*** (.046)	.121 (.064)	-.100 (.086)
No. of companies worked for	.056* (.025)	.019 (.034)	-.005 (.047)
Company tenure	.071*** (.019)	.043 (.027)	-.024 (.037)
Job tenure	-.006 (.025)	.069* (.034)	-.081 (.047)
Technical†	-.095 (.123)	-.026 (.170)	.074 (.231)
Sales	-.166 (.144)	-.114 (.199)	.225 (.270)
Administrative	-.161 (.154)	-.040 (.213)	.288 (.289)
Manager 1†	.702*** (.111)	.302* (.153)	.491* (.208)
Manager 2	2.457*** (.159)	2.081*** (.220)	.830** (.299)
Manager 3	2.932*** (.218)	2.399*** (.300)	.682 (.408)
Structural holes	-1.017*** (.254)	-1.531*** (.351)	-.423 (.477)
F	60.22***	17.29***	2.47**
R <sup>2</sup>	.660	.358	.074
Adjusted R <sup>2</sup>	.649	.337	.044

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ ; two-tailed tests.

\* Standard errors are in parentheses.

† Other functions and non-managerial are the omitted categories.

coefficient of structural holes for the job satisfaction model is in the right direction, though not significant. H1 is supported based on the two key career-performance outcomes of bonus amount and salary level, controlling for many other factors that may influence these outcomes. The total model accounts for 65 percent of the variance in salary and 34 percent of the variance in bonus.

We tested H2 in three different ways. First, we combined the two companies with higher commitment level (Hardware and Telecom) as the high-commitment group and the two low-commitment companies (Software and Mobile) as the low-commitment group and applied the subgroup analysis. Table 5 shows the results. In the high-commitment companies, structural holes are strongly and negatively associated with salary in model 1 and with bonus in model 2. In comparison, in the low-commitment companies, the association of structural holes with salary and bonus is not significant. The subgroup analysis hence supports H2 as far as salary and bonus are concerned.

Table 5

**Subsample Analysis of Career Performance in Low- vs. High-Commitment Organizations\***

Predictor	High Commitment (N = 231)			Low Commitment (N = 186)		
	Salary Model 1	Bonus Model 2	Job satisfaction Model 3	Salary Model 4	Bonus Model 5	Job satisfaction Model 6
Constant	-1.123 <sup>•</sup> (.466)	1.323 <sup>•</sup> (.591)	4.787 <sup>***</sup> (.907)	-1.839 <sup>***</sup> (.419)	-.049 (.671)	5.972 <sup>***</sup> (.809)
Age	.010 (.018)	-.049 <sup>•</sup> (.023)	-.029 (.035)	.016 (.012)	.004 (.019)	.020 (.022)
Gender	.044 (.082)	-.067 (.104)	.125 (.160)	.193 <sup>•</sup> (.088)	.162 (.140)	.225 (.169)
Education	.398 <sup>***</sup> (.067)	.287 <sup>***</sup> (.085)	.089 (.130)	.248 <sup>***</sup> (.069)	-.070 (.110)	-.333 <sup>•</sup> (.133)
No. of companies worked for	.025 (.045)	.036 (.057)	.024 (.087)	.081 <sup>••</sup> (.028)	.025 (.045)	-.020 (.054)
Company tenure	.100 <sup>••</sup> (.031)	.082 <sup>•</sup> (.039)	.075 (.060)	.064 <sup>••</sup> (.024)	.051 (.038)	-.103 <sup>•</sup> (.045)
Job tenure	.045 (.042)	.116 <sup>•</sup> (.053)	-.145 (.082)	-.022 (.029)	.062 (.047)	-.049 (.056)
Technical <sup>†</sup>	-.423 <sup>•</sup> (.191)	-.218 (.243)	.372 (.372)	.237 (.154)	.189 (.246)	-.353 (.297)
Sales	-.438 (.244)	-.107 (.309)	.407 (.474)	.126 (.167)	-.103 (.268)	-.095 (.323)
Administrative	-.243 (.220)	.119 (.287)	.578 (.426)	-.119 (.213)	-.441 (.346)	.172 (.417)
Manager 1 <sup>†</sup>	.750 <sup>***</sup> (.176)	.119 (.223)	.634 (.342)	.707 <sup>***</sup> (.132)	.380 (.211)	.490 (.254)
Manager 2	2.335 <sup>***</sup> (.207)	2.382 <sup>***</sup> (.263)	1.091 <sup>••</sup> (.403)	2.980 <sup>***</sup> (.243)	1.824 <sup>***</sup> (.390)	.269 (.470)
Manager 3	2.331 <sup>***</sup> (.281)	1.949 <sup>***</sup> (.356)	.297 (.547)	4.183 <sup>***</sup> (.324)	3.394 <sup>***</sup> (.519)	1.346 <sup>•</sup> (.625)
Structural holes	-1.223 <sup>***</sup> (.351)	-2.090 <sup>***</sup> (.446)	-.372 (.684)	-.468 (.370)	-.759 (.592)	-.493 (.714)
F	30.48 <sup>***</sup>	13.10 <sup>***</sup>	1.93 <sup>•</sup>	40.73 <sup>***</sup>	7.18 <sup>***</sup>	1.82
R <sup>2</sup>	.646	.440	.104	.755	.370	.121
Adjusted R <sup>2</sup>	.625	.406	.050	.736	.319	.054

•  $p < .05$ ; ••  $p < .01$ ; •••  $p < .001$ ; two-tailed tests.

\* Standard errors are in parentheses.

† Other functions and non-managerial are the omitted categories.

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The second and third ways of testing H2 are to use the interaction of structural holes and high commitment, at the company and at the individual level, respectively. In both cases, we mean-centered the two component measures before entering the interaction term to control for multicollinearity (Aiken and West, 1991). Further, we obtained the variance inflation factors (VIF) for all the variables in the models. All of them were less than 5.0, the accepted cutoff value (Neter, Wasserman, and Kutner, 1990), suggesting that multicollinearity is not a serious concern.<sup>2</sup>

**2**

The VIF values are not shown in tables 4–6 to conserve space but are available through the authors.

At the company level, we used the aggregated commitment scores of the four organizations (Hardware: 4.55, Software: 3.65, Mobile: 3.95, and Telecom: 4.20). The results in table 6

Table 6

**Interaction Effects of Commitment and Structural Holes on Career Performance (N = 417)\***

Predictor	Salary		Bonus		Job Satisfaction	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	-.918 (.528)	-1.420*** (.355)	1.213 (.730)	.359 (.494)	5.614*** (.999)	.756 (.512)
Age	.016 (.010)	.021* (.010)	-.010 (.014)	-.008 (.014)	.005 (.019)	-.016 (.015)
Gender	.116 (.061)	.131 (.061)	.030 (.085)	.046 (.085)	.181 (.116)	.072 (.088)
Education	.357*** (.046)	.342*** (.046)	.132* (.064)	.127* (.064)	-.099 (.087)	.052 (.067)
No. of companies worked for	.057* (.026)	.064* (.025)	.020 (.036)	.026 (.035)	-.012 (.049)	.038 (.036)
Company tenure	.072*** (.019)	.064** (.019)	.044 (.027)	.040 (.027)	-.023 (.037)	-.027 (.028)
Job tenure	-.007 (.025)	-.006 (.025)	.067 (.034)	.075* (.035)	-.085 (.047)	.020 (.036)
Technical†	-.095 (.123)	-.086 (.123)	-.028 (.170)	-.039 (.171)	.067 (.232)	-.159 (.177)
Sales	-.188 (.143)	-.149 (.143)	-.143 (.198)	-.117 (.199)	.211 (.271)	-.070 (.206)
Administrative	-.157 (.154)	-.154 (.155)	-.033 (.213)	-.077 (.215)	.307 (.292)	-.206 (.223)
Manager 1†	.693*** (.110)	.727*** (.111)	.291 (.152)	.296 (.154)	.493* (.209)	.194 (.160)
Manager 2	2.459*** (.159)	2.448*** (.159)	2.085*** (.219)	2.048*** (.221)	.842** (.300)	.455* (.229)
Manager 3	2.981*** (.217)	2.949*** (.217)	2.464*** (.300)	2.388*** (.302)	.709 (.411)	.050 (.313)
Affective commitment		-.078* (.038)		.010 (.053)		.714*** (.055)
Structural holes	-.975*** (.256)	-1.027** (.252)	-1.482*** (.354)	-1.555*** (.351)	-.447 (.484)	-.628 (.364)
High commitment‡	-.142 (.095)	.038 (.041)	-.196 (.131)	.000 (.053)	-.138 (.179)	.174** (.055)
Structural holes × High commitment (H2)	-1.607* (.751)	-.794** (.304)	-2.034* (1.038)	-.828* (.423)	-.202 (1.419)	-.596 (.439)
F	53.22***	50.59***	15.52***	14.33***	2.18**	21.85***
R <sup>2</sup>	.666	.669	.367	.364	.075	.466
Adjusted R <sup>2</sup>	.653	.656	.344	.339	.041	.445

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ ; two-tailed tests.

\* Standardized errors are in parentheses.

† Other functions and non-managerial are the omitted categories.

‡ High commitment is the organizational score in models 1, 3, and 5 and the individual score in models 2, 4, and 6.

for salary (model 1) and bonus (model 3) show a significant interaction effect of structural holes with commitment. The sign of the coefficient on the interaction term suggests that the relationship is more negative in companies with a high-commitment culture.

Thus far, we have discussed culture differences at the organizational level, i.e., whether a firm is a high-commitment organization and the implications for the employee's social capital, but within the same organization, owing to different functional backgrounds or product portfolios, there can be significant interdepartmental differences (Schein, 1985; Martin, 1992; Trice and Beyer, 1993). Even in the same department, because of different management styles, there can be important interpersonal differences. Acknowledging lower-level differences, scholars have conducted organizational studies at the job or the individual level (Tsui et al., 1997; Lepak and Snell, 1999). Individuals' descriptions of the commitment level of the organization will reflect the culture of the immediate neighborhood of the employees. Because the personal bias or affect of the employees may taint such evaluations, we controlled for the affective commitment of the employees in this analysis. The test on the interaction of structural holes and high commitment at the individual level also serves as a robustness check on the tests at the company level.

Models 2, 4, and 6 in table 6 show the results. The organization's commitment to employees, measured at the individual level, has a negative interaction with structural holes for salary in model 2 and for bonus in model 4. Hence, H2 also receives support at the individual level. These results are consistent with those in models 1, 3, and 5 performed at the company level.

### **Qualitative Data: From Brokers to Integrators**

Our quantitative results for H2 were corroborated and enriched by the qualitative data we collected from our interviews. The qualitative data suggest that, in high-commitment organizations, the comparable role to that of the broker is what may be called the integrator. In network terms, integrators are defined as those having large and relatively dense ego-centered networks, with few structural holes. As do brokers, integrators bring disconnected parties together. But they do it with a different agenda, in a different way, and with different ramifications. Brokers seek, protect, and preserve their position as the *tertius*—sometimes even creating such positions through deliberate actions, e.g., “divide and conquer”—to profit from their colleagues' disconnection. Integrators, in contrast, do not hesitate to pull divided colleagues together and, by doing so, in the interest of the company, fill in the holes the first time they see them. While brokers seek to generate profits in which they will “have a hand in distribution,” integrators bear in mind the interests of the organization as a collective rather than their own interests as individual agents. They are the real bridges that make communication faster and more fluent across boundaries inside an organization. As a result, information and resources can arrive at the part of the organization that needs them most at the right time or without delay. Integrators in this sense take

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the role of the *tertius iungens* (“the third who joins”) rather than the *tertius gaudens* (“the third who enjoys”), which Obstfeld (2005) found to predict the engineers’ involvement in innovation in a division of an automotive manufacturer.<sup>3</sup>

Integrators create value by performing the integration function in the organization (Lawrence and Lorsch, 1967), and, in return, the organization duly acknowledges their contributions and rewards them for their valuable services. Trust, reciprocity, and reputation—the key elements of social capital as defined by Coleman (1988)—are indispensable for fulfilling the role of an integrator. Our interviewees returned to this theme frequently. For example, a logistics manager at Mobile was in a typical boundary-spanning job; coordinating more than ten departments was her routine daily work. She emphasized the importance of trust, credibility, and reciprocity for her job:

In a company, there are many processes and policies. Whether you can accomplish a thing, and how fast you can accomplish it, depends on your credibility. Some procedures, if completed according to formal policies, may need a day. But if you have high credibility, all you need to do is just give someone a phone call. And it is done right at that moment. These relationships are mutual. If a person is not in a hurry, he will not ask me for it. If he asks me for it, it means he is in a hurry. [If I help him this time], next time he will do the same thing for me. So we have trust. With this trust in place, many things can be accomplished. You build up your credibility at that point. It will not be limited to that point. It will go to other points in the network. So your credibility expands to the whole plant. (MO 18)<sup>4</sup>

A senior product manager at Hardware had a similar need to coordinate many different departments in his job and held similar views on how an effective manager works:

All those departments [that you collaborate with] need to have a positive evaluation of you. You have to build up a kind of influence. . . . This atmosphere of cooperation is very important. This is basic for personal development. If these people [the focal person’s contacts] are distant but know each other, our first reaction is that it is good. If they are distant and do not know each other, it is just his [the focal person’s] personal attraction; how it will impact his career development is not clear. But if they are distant and know each other, there will easily emerge a consistent evaluation in the company or beyond, in the industry, a sort of consensus. Then this person’s momentum [for career advancement] is there. (HD 11)

Trust-based ties are important not only in facilitating cross-boundary cooperation, they are also significant in promoting local cooperation, in which a supportive core team around the focal person is of great value. In particular, several interviewees highlighted how a cohesive neighborhood around the job is good for the transfer of tacit knowledge, including local knowledge that is heavily embedded in the context (the case in the first quotation below) or operational technical know-how that is difficult to learn for oneself (the case in the second quotation):

When your boss is assigning tasks to you, he does not have the time and energy to tell you all the background of a task. This makes it very difficult for you, because you have to guess it. If you have a

**3** As one reviewer pointed out, practitioners are increasingly using the term “netweaving” to refer to this kind of integrating behavior.

**4** In reporting the interview data, we identify interviewees by assigning them a number and a company code (HD for Hardware, SF for Software, MO for Mobile and TE for Telecom).

good relationship with the boss, you can come to know his way of thinking, [because] his way of thinking is consistent. You know immediately why he wants you to do that. So you will not make mistakes. It is rare that you misunderstand him and waste your own time and energy. (MO 18)

Now software is becoming more and more complicated. . . . For instance, if you want to use a code, you know roughly that code is more or less what you want, but you still ask that person questions like, "Is there anything I should pay special attention to?" etc. Engineers' communication is like that: for a specific technical problem, look up the right person. . . . You ask them how to use that code. (MO 19)

The interviewees were wary of those who had open networks full of structural holes. One manager from Mobile commented on those who tend to have this kind of network:

Your first impression of him will be very good. Then, as time goes by, you will get the feeling that this guy has a bit of a problem with his spirit of cooperation. You just have the feeling. It does not mean he did something wrong. I do not think people like him can stay in the company. They will leave finally. They have a strong motive to be the leading sheep, or the first hand. There are not many first hands [positions] inside a company. So he will not get what he wants. He is very active, but his promotion will be, on the contrary, not very fast. (MO 19)

They were also fully aware and wary of the risks of the structural holes strategy, due to the difficulty of hiding information (the first quotation below, from Mobile) or the lack of a core team (the second quotation, from Telecom):

Normally, the results [of brokering] are no good, because, at higher levels, people can have very good relationships among themselves. It is very difficult to keep the information among only some of them, [especially] when it is something of importance. . . . You will not be able to see these relationships inside the office. On the surface, it appears that they do not have very good relationships. (MO 17)

You have an open network, but you don't have a core-competence network. You need a core team. You connect for the sole purpose of connection; you become a mere information receiver, a point in the network, not really adding value. . . . A closed network will make a contribution, but an open network can make no contribution, no output. It is network for the purpose of network. (TE 15)

One manager who had recently acquired an M.B.A. degree was especially insightful and articulate about the drawbacks of brokers inside a high-commitment company:

We are a team, so the most important thing is to let the team run it, or, instead, you run it yourself, in which case you contain it and try to keep others from running it. That should not be your objective. It is important to get it running, and then the efficiency is improved. In type A [open networks], you are unique because you are a broker, you control many things . . . but you will have a credibility problem inside the company. . . . The biggest problem is that you hold others down, but [by holding others down] you also hold yourself down. The result of this is the credibility problem: people do not trust you. (MO 21)

Interestingly, the advantage of structural holes only surfaced when we interviewed employees from Software, the clearly

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low-commitment company in our sample. Two quotes on the information benefits of a wide, open network are relevant here:

Technology [career path] and management [career path] are different. For technology, as long as I have a few good friends with whom I can exchange technological views, it is fine. For management, it is different. You need build up a web of people, including top and bottom, different departments, with whom you can speak. You need different interaction strategies to deal with these different people who do not necessarily know each other. (SF 4)

They provide me with all kinds of information and advice on the internal and external environment of the company. These are the kind of people I would like to get to know. They can be said to be the mainstream people of our company. For instance, our company restructures very frequently . . . when the organization restructures, they will give us advice, whether it is good to stay in the old department or go to a new department; whether it is good to try to get a new position; how it will affect my career development, etc. (SF 5)

The qualitative evidence adds to the results we obtained from the quantitative models and leads to the same caution: there is no problem with applying structural holes theory to firms and individuals in contexts that operate on the market-competition and individualistic model, but in contexts that value cooperation and the collective, the theory's normative implications need to be reconsidered. This is especially true when the firms are high-commitment organizations that rely heavily on informal mechanisms of trust and cooperation. Career advantages accrue to those who serve as integrators rather than those who play the role of brokers.

## **DISCUSSION AND CONCLUSION**

By examining social capital mechanisms in four organizations in China, we built a more contextualized view of social capital theory that takes into account the roles of national culture and organizational culture in molding the behaviors of individuals. Our empirical results show that, in a collectivistic culture, structural holes in an employee's career network tend to be detrimental to the employee's career development. Further probing at the organizational level revealed that the network consequences of social capital differ across organizations. Although structural holes may bring positive returns to individual actors in a market-like, low-commitment organizational culture, it is network closure that will bring advantages to the actors, by facilitating trust, reciprocity, and reputation, in a clan-like, high-commitment organization with a strong cohesive culture. Further, to the extent that brokering runs counter to the way of doing things in high-commitment, collectivistic organizations, brokering is a risky venture in those firms.

The commonality between the national level and organizational level of this study is the term "collectivistic," describing contexts with a strong and cohesive culture (e.g., Earley, 1993; Chatman and Barsade, 1995; Chatman et al., 1998). While organizations based on economic exchange with minimum social obligations are said to be more individualistic, high-commitment organizations are more collectivistic. This is

the logic according to which high-commitment and collectivism work in the same direction in the social capital model. They both work to dampen the effect of structural holes and to enhance the effects of network closure.

Although this theoretical link provides a means to simplify the theory of social capital in different cultures, we must be cautious about an important difference between collectivism at the national level and collectivism at the organizational level. While collectivism at the national level is collectivistic for the in-group (not for the nation), at the organizational level, collectivism is collectivistic for the organization. Hence, collectivism at the national level and collectivism at the organization level are actually two different phenomena. While collectivism at the national level takes the in-group as the reference point for decision making, collectivism at the organizational level focuses on the organization. Collectivism in the abstract is the same, but the unit of the collectivity is different.

Our baseline result indicates that, overall, structural holes are detrimental to the career performance of employees in Chinese organizations. This is in stark contrast to the results of studies using Western samples, which have consistently found positive effects for structural holes in terms of rank (Burt, 1992, 1997), bonus (Burt, 1997), and salary (Burt, Hogarth, and Michaud, 2000). Betweenness centrality, a correlate of structural holes, has also predicted promotion to the supervisory level (Brass, 1984) and the supervisor's performance rating (Mehra, Kilduff, and Brass, 2001). The many methodological differences among these studies notwithstanding, whether the network studied was ego-centered or the full network, and no matter which dependent variables these studies used, the conclusion was that structural holes provide social capital. The results of our study, however, suggest possible limits to the generalizability of the structural holes theory to different macrocontexts. While structural holes can bring information and control benefits to employees and managers in an individualistic culture, the collectivistic culture of China requires network closure that can bring the individuals into the in-group of trust and reciprocity.

Although the cross-cultural difference between China and the West is relatively easy to comprehend, it is important to further consider organizational culture as a contingency factor of social capital. Structural holes theory is essentially a theory of the market with its roots in the study of market structure (Podolny and Baron, 1997). The idea of a broker who thrives on the unconnectedness of his or her contacts, for instance, can easily conjure up the image of businesses that painstakingly prevent upstream information from moving downstream. The parallels to concepts like monopoly and collusion in the industrial-organization and strategy literature are also evident. The idea of structural autonomy is tantamount to monopoly (Burt, 1980, 1992), and industries occupying many structural holes are the most likely to be attractive industries according to Porter's (1980) five-force model. Burt (1992, 1997, 2000) extended the structural holes theory inside organizations and made strong arguments for the benefits of structural holes for individual employees in the firm. There are important advantages to operating at a high level of

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abstraction by applying network theories across disparate levels of analysis (from firms in the market to employees in firms), but the different nature of the phenomenon at different levels suggests some cautions in drawing sweeping conclusions across levels.

Organization scholars have warned of the problem of applying market-based theories inside organizations (Goshal and Moran, 1996; Podolny and Page, 1998). Researchers have pointed out for a long time that markets and firms are fundamentally different governance forms (Coase, 1937; Williamson, 1975, 1985; Kogut and Zander, 1992; Zander and Kogut, 1995) and that firms cannot be replaced by market mechanisms (e.g., Holmstrom and Milgrom, 1994; Williamson, 1994; Baker, Gibbons, and Murphy, 2001). Our study suggests that structural holes, as a market-based concept, may be social capital for managers in low-commitment organizations that are more akin to the market (a typical example is stock brokers in investment banks), but in high-commitment organizations with strong norms of cooperation and effective sanctions for self-seeking, opportunistic behaviors, they can actually become a liability to career advancement. This is a very strong result, given that the collectivistic norms in high-commitment organizations usually drive these organizations to adopt equality rather than equity as the principle of reward allocation, and they hence tend to have a more even distribution of salaries and bonuses within the company (Chen, Chen, and Meindl, 1998).

There are two features of this study, however, that may raise questions. First, our companies are from the IT sector. IT companies generally have a greater need for the transfer of tacit knowledge, which typically requires network closure rather than a network replete with structural holes (e.g., Hansen, 1999; Reagans and McEvily, 2003). This important factor, however, has been controlled, given that previous studies that we used as benchmarks were also in the IT sector (Burt, 1992; Podolny and Baron 1997; Mehra, Kilduff, and Brass, 2001). Second, the positive effect of structural holes that Burt (1992, 1997) found was among senior executives. To assess whether our negative effect was due to the lower organizational rank of our sample, we performed a test on the interaction of structural holes and levels (with the same set of control variables). The interaction effect of level and structural holes was  $-1.38$  ( $p < .001$ ) on salary and  $-1.58$  ( $p < .001$ ) on bonus, suggesting that the negative relationship between holes and those two career outcomes is more negative for senior managers. These results indicate that the negative effect in our study is not due to the low ranks of the sample in the organization.

The study has some limitations. First, due to the brief time frame, career-performance measures in this study were limited to salaries and bonuses. Future research could include performance variables such as the number of promotions (rank changes) and turnover, which typically require a longer time horizon and can better eliminate the reverse causality concern, and network influence and reputation, which involve more intricate network methodologies (Brass, 1984; Kilduff and Krackhardt, 1994). Second, because we used ego-cen-

tered networks, apart from potential bias introduced by the method, we also did not have information on the full network. As a result, we could not know the position of these employees in the full network, for instance, whether they were central or peripheral members of the network and whether structural holes were only a surrogate measure of people's positions in the full network. In addition, our different sampling methods in the four organizations could bring some unobserved heterogeneity to the study. For instance, Telecom consists of mostly R&D employees. The conditions and patterns of career mobility might be different for them than for other employees who are in administrative and marketing positions. Last, in our study, we used a single-item measure (job satisfaction) with unknown reliability. This may account for the largely nonsignificant findings on this variable.

In networks of senior executives, Burt (1997) found a positive effect of structural holes, especially for those senior executives in unique jobs. In fact, given that senior executives need to represent their firms in the market, and their networks to a large extent comprise external contacts, the large number of structural holes in their networks among these external contacts should have a positive instrumental value for the success of their organizations. It is an open question, however, whether such effects would be muted in a high-commitment societal context. Future research is needed to extend the theory of structural holes to interorganizational networks in the collectivistic context.

Another possible theoretical extension lies in the temporal dimension of networks (or the evolution of networks). Although we tried to control the reverse-causality issue in this study, the fact that performance and network building are both ongoing processes makes it more likely that there is a kind of structuration effect: networks affect performance, and performance affects networks (Brass and Burkhardt, 1993; Brass, 1995). This is an interesting direction for future research, which will require time-series data on performance and networks.

Burt (2002) discussed how the bridging ties tend to decay over time. In the current study, by taking a snapshot of the network, we did not take into account those holes that had already been filled by our integrators. Thus we may have underestimated the importance of structural holes because the information benefits of structural holes had already been built into these closed networks. In other words, there are two kinds of closure. In the first kind of closure, the alter-alter ties were previously holes and are the result of hole-filling processes ("achieved closure"). In the second kind of closure, the alter-alter ties have existed from the very beginning ("ascribed closure"). It is very plausible that achieved closure might bring more returns to the ego than would ascribed closure. Another critical issue from this perspective is the question of who initiates the hole-filling process. If the individual initiates the process, much of the value thus added might be attributed to him or her—herein lies the reason why the individual is willing to initiate the hole-filling behavior. Conversely, if the process is initiated by the alters, its ramifications are

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different. And what might they be? This evolutionary perspective indicates a promising direction for future research.

The integrator is not only a role leading to positive career performance for the individual in collectivistic cultures but also may be at the core of the success of organizations. When integrators are at the same time boundary spanners, how they play the boundary-spanning role and its implications for interorganizational relationships are worth pondering, especially in comparison with brokers who hold a similar position. While brokers typically tend to be "gatekeepers" and will control the inflow and outflow of information, advice, or trust to maximize their interests in their organization, integrators will probably instead open the gate to introduce outsiders to their colleagues, essentially serving as "pathfinders" or "navigators." While this may render obsolete the prestigious and advantageous position they hold, the organization benefits as a whole. The function of integrators may be especially indispensable for those organizations that need to establish close relationships with others around them, which is increasingly a case for many companies in the East and West alike. How culture, including national culture and organizational culture, would play a role in this process and what the implications would be for the competitiveness of these companies are all questions yet to be explored.

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