

Social Capital and Organizational Performance: Evidence from Urban Public Schools

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In this paper we examine social capital and its relationship with performance at the organizational level. We predict that both internal and external social capital will have a positive effect on organizational performance. We test our hypotheses in 88 urban public schools where we collected data from principals, teachers, parents, and students. Results indicate that both internal social capital (relations among teachers) and external social capital (relations between the principal and external stakeholders) predict student achievement in mathematics and reading. These effects were sustained over time for reading achievement, providing support for a causal relationship between social capital and performance. We provide evidence that social capital's impact on student achievement in math—but not reading—is mediated by the quality of instruction provided by teachers. These results underscore the importance of context in studies of social capital.

Key words: social capital; human capital; learning; public schools

Social capital, generally defined as the actual and potential resources embedded in relationships among actors, is increasingly seen as an important predictor of group and organizational performance (Adler and Kwon 2002, Leana and Van Buren 1999, Nahapiet and Ghoshal 1998, Bourdieu 1986). At the organizational level, social capital has been used to describe both the aggregate form and nature of relationships among organizational members (e.g., Coleman 1990, Leana and Van Buren 1999), as well as the linkages between the organization and its external stakeholders, competitors, or partners (e.g., Kale et al. 2000, Uzzi 1997). Both conceptions of social capital focus on the nature and strength of relationships and the communication flows in which individuals and organizations are embedded. The advantages ascribed to social capital include better group communication; more efficient collective action; enhanced stocks and use of intellectual capital; and better access to resources (Adler and Kwon 2002, Leana and Van Buren 1999, Nahapiet and Ghoshal 1998, Hansen 1999).

Much of the social capital literature at the organizational level has concentrated on the effect of either internal or external social capital. Sociologists and organization theorists such as Coleman (1988, 1990) have tended to look inside organizations and examine the relationship among individual members or groups (e.g., Hansen 1999, Tsai and Ghoshal 1998). Research in the business strategy area, in contrast, has focused on external relations between the organization and important stakeholders (e.g., Dyer and Singh 1998, Koka and Prescott 2002). Research has shown both forms of social

capital to be important predictors of performance at the organizational level. Additionally, social capital theory and research are increasingly integrative, with models and research studies incorporating multiple forms of social capital (e.g., Seibert et al. 2001, Collins and Clark 2003).

Following this integrative approach, in this paper we examine the effects of both internal and external social capital on organizational performance. Our basic premise is that social capital can enhance performance at the organizational level, and that its benefits are a result of both the relationships among individual members—referred to as *internal social capital*—and the links between the organization and its external stakeholders—referred to as *external social capital*. We test our hypotheses in 88 urban public schools where we collected data from principals, teachers, parents, and students.

Internal Social Capital

Internal social capital is defined in terms of both the structure and the content of relationships among actors within a system (Adler and Kwon 2002). Nahapiet and Ghoshal (1998) specify three facets of internal social capital: structural, relational, and cognitive. The structural aspect of social capital refers to the connections among actors—with whom and with what frequency they share information. Nahapiet and Ghoshal (1998) argue that such information flows create competitive advantage by enhancing the organization's ability to absorb and assimilate knowledge. Zander and Kogut (1995) show empirically that this may be a key factor

in the speed with which manufacturing innovations are transferred internally or imitated from other firms. Information sharing plays another role in enhancing competitive advantage by facilitating individual learning in a context in which it has meaning: Individuals learn how knowledge in use may differ from formal documented practice via storytelling, reflective dialogue, and collaborative discussions (Jordan 1989). Such situated learning is thought to enhance performance, particularly in knowledge-intensive organizations. Information sharing and exchange more generally can also enhance cooperation and mutual accountability (Sparrowe et al. 2001).

Second, the relational aspect of social capital “describes the kind of personal relationships people have developed with each other through a history of interactions” (Nahapiet and Ghoshal 1998). Among its key attributes is the level of trust among actors (Leana and Van Buren 1999, Nahapiet and Ghoshal 1998). Trusting relations facilitate collaborative behaviors and collective action in the absence of explicit mechanisms to foster and reinforce those behaviors (Coleman 1990, Onyx and Bullen 2000). Regarding its relationship to the structural aspects of social capital, trusting relations allow the transmission of more information as well as richer and potentially more valuable information. Members who trust one another are more likely to exchange sensitive information that is not available to others outside the circle of trust. They are less likely to fear opportunistic behavior on the part of their colleagues, enabling an environment of collaboration and exchange that can benefit both organizations and the individuals who work within them (Bradach and Eccles 1989, Sable 1993, Rousseau et al. 1998).

Third, the cognitive aspect of social capital refers to the fact that as individuals interact with one another as part of a collective, they are better able to develop a common set of goals, and a shared vision for the organization—what Nahapiet and Ghoshal (1998) call the cognitive dimension of social capital. The shared vision and goals, and the collectively held values that underlie them, help promote integration and create a sense of shared responsibility and collective action (Coleman 1990). Leana and Van Buren label this phenomenon *associability*, or “the willingness and ability to define collective goals that are then enacted collectively” (1999, p. 542). When a community collectively holds a set of goals, the likelihood of free-rider problems is diminished. In these ways, social capital may be a substitute for the formal contracts, incentives, and monitoring systems that organizations devise to control individual self-serving behavior that may hamper the attainment of collective goals. Additionally, the cognitive aspect of social capital is both reinforced by, and reinforcing of, the structural and relational components. People who share the same mental models about their work are also more likely to have high-quality relations

with one another and to interact with one another and share information regularly (Mohammed and Dumville 2001). According to Nahapiet and Ghoshal (1998), the three aspects of social capital—structural, relational, cognitive—work together to enhance information transmission and absorption among organizational members and thus enhance organizational performance.

Of the three facets of social capital, the structural dimension has received the most attention and is the most common way that social capital is operationalized in research, typically through social network analysis (e.g., Baker 1990; Burt 1992, 1997). However, many researchers have recommended that the construct be defined more broadly to include not just the structure of relationships among actors, but also the character and content of those relationships (Adler and Kwon 2002, Leana and Van Buren 1999, Nahapiet and Ghoshal 1998, Portes 1998). There is empirical evidence to suggest that the nature of ties explains additional variance in outcomes beyond that explained by structure alone (Lin 1999). This broader approach allows researchers to not only capture more comprehensively the social aspect of social capital, but it also more fully accounts for the capital aspect. Social capital is not just the network itself, nor the links among people that comprise it, but the resources that are created by the existence and character of those links such as information sharing and trust (Adler and Kwon 2002, Nahapiet and Ghoshal 1998). Indeed, Seibert et al. (2001) note that the empirical research on social capital has not adequately incorporated variables such as access to quality information that explain how social capital creates value.

External Social Capital

Internal social capital may not in itself result in enhanced organizational performance. Indeed, close ties may result in conformity to a degree that is negative (Portes 1998, Uzzi 1997). This is one reason that accessing external information and resources is also a critical aspect of social capital (Burt 2000).

Links with external others may be beneficial to the organization in a variety of ways. External linkages may provide access to key external providers of resources such as suppliers and alliance partners. Heller and Firestone (1995) find in their research that external ties are important to organizations in obtaining resources, including funding and personnel. Managing external ties also provides a means to buffer the organization from harmful or disruptive external influences (Useem et al. 1997). External ties increase predictability in interactions with the environment, and provide opportunities to directly manage and influence sources of uncertainty (Leana and Barry 2000, Pfeffer and Salancik 1978).

Rosenthal (1996) finds that teams composed of individuals with ties outside the team performed much

better in improving quality in manufacturing plants. The importance of interunit interaction has been repeatedly shown for both the creation and the diffusion of innovation in organizations, and for group and organizational performance more generally (e.g., Hansen 1999, Tsai and Ghoshal 1998). Similar arguments have been made regarding the importance of external ties to corporate performance at the firm level (e.g., Geletkanycz and Hambrick 1997, Kogut 2000).

External social capital is often operationalized in research as the connections held by top managers. Reasoning that top managers are the primary boundary spanners in organizations, Geletkanycz and Hambrick (1997) and Collins and Clark (2003), for example, studied the importance of external links by examining top managers' efforts in for-profit firms to build such connections. Collins and Clark (2003) find that the strength and range of external connections made by top managers in high-technology firms are significant predictors of firm sales growth and stock returns. Using data from two different industries, Geletkanycz and Hambrick (1997) find that top managers' external ties are critical to developing novel competitive strategies for the firm. Furthermore, when these ties are matched with the information needs of the firm, average return on assets is enhanced.

Social Capital in Context

Various researchers have called for a more serious treatment of context in organizational studies (e.g., Heath and Sitkin 2001, Johns 2001, Mowday and Sutton 1993). Social capital is a relational construct that by its nature is dependent on the interaction of individuals. Such interaction takes place within particular contexts and, as Rousseau and Fried (2001) and others (e.g., Cappelli and Sherer 1991, Johns 2004) argue, work context can matter a great deal in shaping organizational behavior.

The research described here was conducted with teachers and principals in urban public schools. This context is a particularly appropriate one for the study of social capital because information exchange is central to effective teaching. Moreover, based on empirical findings, educational scholars are changing their normative models about best practices regarding how schools should be organized and how the work of teaching should be performed. These recent approaches emphasize more and higher-quality interaction among teachers to enhance school performance (Bryk and Schneider 2002, Hargreaves 2003, McLaughlin and Talbert 2001, Spillane et al. 2001).

The importance of examining a broader community as a source of social capital for students, and a means of enhancing student performance, has a long tradition in the literature (cf. Hanifan 1916, and more recently, Coleman 1988). However, teaching in public schools more often has been viewed as routinized labor requiring

bureaucratic control (Sarason 1990). This was coupled with professional norms of individual autonomy for teachers (Warren 1975). These norms are breaking down (Louis et al. 1996), and schools are increasingly viewed as communities of professionals working together to generate, combine, and transmit knowledge (McLaughlin and Talbert 2001, Smylie and Hart 1999). Internal relations among teachers are increasingly viewed as means to develop and diffuse effective teaching techniques, maintain a common focus, and ultimately enhance student learning (Bryk and Schneider 2002, Smylie and Hart 1999).

Such a change in approach to teaching may be largely the result of the increased emphasis on student achievement testing fostered by the federal No Child Left Behind (NCLB) Act (Public Law 107-110) implemented in 2002. NCLB mandates sanctions for schools—not individual teachers—that fail to meet performance targets. This emphasis on school-level performance as measured by student achievement scores encourages administrators and teachers to view student performance as a collective effort across the school rather than as a solo endeavor by individual teachers within the school. Indeed, in many states student achievement testing is done only at certain grade levels (e.g., 4th, 7th, and 11th). However, schools rather than teachers are held accountable by NCLB, so the entire teaching staff within the school is held accountable for ensuring that student achievement goals are attained. To this end, schools are increasingly enacting collective mechanisms to enhance performance. Mechanisms include team-based professional development, common planning time for teachers, cross-grade teams, and collective accountability measures (Bryk and Schneider 2002, McLaughlin and Talbert 2001, Smiley and Hart 1999).

Internal social capital among teachers should facilitate achievement of this collective goal. When teachers share information, have quality relations, and share the same conception of the school's mission, performance should be enhanced.

HYPOTHESIS 1 (H1). Higher levels of internal social capital within the school will be associated with higher levels of school performance.

Our second hypothesis concerns the role of external social capital and school effectiveness. Perhaps even more than for business firms, schools must be attuned to their external environments. There is intense public scrutiny of schools and a host of constituency relationships that must be managed by school administrators. Such management includes gathering information on, for example, changing community needs, as well as transmitting information to constituents about the school and fostering reasonable expectations of it (Morris et al.

1984). School administrators—particularly principals—are also assuming a more prominent role with respect to mobilizing external resources and support as national and state efforts to make schools more accountable, and efforts to restructure schools for improved performance, become more widespread (Goldring 1995, Smylie and Hart 1999). Boundary management, then, is important both for bringing new resources into the school and for effectively representing the school to community groups, potential funders, parents, and other stakeholders. Thus, external social capital should be associated with stronger school performance.

HYPOTHESIS 2 (H2). *Higher levels of external social capital for the school will be associated with higher levels of school performance.*

Besides these direct effects of internal and external social capital on school performance, we hypothesize mediating relationships. Traditionally, the education literature has focused on the quality of classroom instruction as the primary indicator of performance (see Currall and Kohn 1996). As stated earlier, due to recent legislation the focus has changed in schools to be squarely on student achievement. Moreover, as indicated in our earlier discussion, more recent approaches in education research have begun to examine aspects of social capital as predictors of performance. This research, however, has largely emphasized the relational aspects of social capital such as trust (e.g., Bryk and Schneider 2002, McLaughlin and Talbert 2001) and has focused almost exclusively on internal social capital—relations among teachers and administrators and within teacher groups—without simultaneously examining external linkages such as those to outside sources of information and other external resources (see Spillane et al. 2001 for an exception).

In this research we integrate the traditional and more recent approaches in the education literature by proposing that the quality of instruction that teachers provide mediates the relationship between social capital and student achievement in schools. Drawing on Nahapiet and Ghoshal's (1998) model of social capital, as well as Adler and Kwon's (2002) formulation of opportunity, motivation, and ability in explaining social capital effects, we propose that all three facets of internal social capital act to enhance instructional quality, which in turn affects student achievement. Interactions with others within the school (structural dimension of social capital) should improve instructional quality primarily through enhancing teachers' opportunities to access a more diverse set of instructional practices by sharing information with one another about techniques used in individual classrooms. Trusting relations among teachers (relational dimension) should enhance instructional practice primarily through enhancing teachers' motivation to share information with one another, particularly

when that information might reveal weaknesses or techniques that have not been successful in the classroom. The cognitive facet of social capital should have its primary effect on overall ability in terms of fostering new intellectual capital (Nahapiet and Ghoshal 1998). When teachers share the same goals and vision, they should be better able to combine their localized knowledge to develop new approaches to instruction.

The effects of external social capital on student achievement may be similarly mediated by instructional practice. External social capital may result in better information and resources coming into the school, resulting in higher-quality instruction in the classroom. External linkages can bring financial resources, political support, and parent engagement—all of which are factors that can influence how teachers approach their work with students and, thus, how well students learn. Teachers in schools that are better connected to external stakeholders may have access to a wider range of instructional material and better knowledge about individual student circumstances than teachers in less well-connected schools. In this way, quality of instruction is proposed to mediate the relationship between external social capital and school performance.

HYPOTHESIS 3 (H3). *The quality of instruction in the school will mediate the relationship between internal social capital and student achievement.*

HYPOTHESIS 4 (H4). *The quality of instruction in the school will mediate the relationship between external social capital and student achievement.*

Methods

Research Setting

The research was conducted in an urban public school district in the northeastern United States. The district comprised 95 schools, of which 59 were elementary schools and 36 were middle, secondary, and special schools (i.e., schools specializing in vocational training, creative and performing arts, etc.). Like many urban districts in the United States, the student body was largely low income (65% on government-subsidized lunch programs) and minority (more than 60%), with a significant number of special education students (17%). Total enrollment in the school district was approximately 38,000 students, and the district had a total of approximately 5,200 employees. Of the 95 schools in the district, we received complete data on 88 schools, for a participation rate of 93%.

Procedures

The research was conducted over an 18-month period from 2000 to 2002, and data were collected using several different methods. To better understand work processes, social interactions, and external linkages, we

began our research with qualitative assessments. We conducted semistructured interviews with a sample of school principals and teachers, as well as with district top and middle managers, and with district support staff. We also spent significant time in a small group of elementary, middle, and high schools within the district to observe their functioning firsthand, and to get a better sense of physical facilities, staffing use, day-to-day job activities, etc. In several schools, we accompanied school staff on “Learning Walks,” a structured qualitative process to assess the quality of instruction within particular classrooms and the school as a whole (Resnick and Glennan 2001). We also conducted several focus groups with principals and teachers from urban districts around the United States to help develop our quantitative measures.

Based on information gathered through these qualitative methods, we constructed several quantitative measurement instruments. First, we surveyed all teachers in the district in February 2001. The surveys were distributed during an orientation session of elected peer representatives for all schools within the district. This session was conducted by the researchers who explained procedures, confidentiality, and the purpose of the survey. Each peer representative later administered the surveys within his or her school during prescheduled faculty meetings on school time. School principals were not part of this process and the completed surveys were returned directly to the researchers. All but one school elected to participate in the teacher survey ($n = 94$), and we received responses from 2,167 teachers, representing 80% of all potential respondents. There was some variability in response rates across schools but no discernable patterns; 92% had response rates over 50%.

During the same period, the district conducted its own survey of students’ parents. A total of 5,130 parents responded to the district survey, with an imputed response rate of 23%.¹ The surveys were mailed to parents at home and were anonymously returned by mail to a central processing center in the district. From these surveys we developed an average measure of instructional quality for each school. Because the surveys were anonymous, parent responses could not be tied to individual students or teachers.

In March 2001, we conducted training sessions with all principals in the district on the use of a time diary methodology that we developed for the research. The principals were asked to keep time diaries of their work activities over a one-week period. We were concerned about the practicality of using a written time diary because of the burden it places on subjects, so we developed a PDA (Palm Pilot) software tool that made the task of entering all significant activities less time intensive. The PDA beeped at two-hour intervals to remind principals to periodically enter their information if they

had not entered it, and also recorded the actual time that entries were made to ensure temporal proximity between the recording of activities and the actual time the activities took place. The software requested both the start and end time of each activity the principal undertook, as well as the nature of the activity, thus enabling the principals to select a time frame that matched their actual behaviors.

As an incentive to participate in the study, the principals were given the Palm Pilots to keep for their personal use once all data were collected and recorded. A total of 88 principals completed the time diaries for a 93% response rate. The reasons for nonparticipation included illness (two principals), problems understanding or learning the PDA software (one principal), and the feeling that the methodology was too time consuming or intrusive (four principals).

We also gathered archival information on each school from district and state records. These data consisted of descriptive characteristics of the schools (e.g., socioeconomic status of student body) as well as the student achievement test scores in reading and mathematics, which were administered in May of each year.

Measures

Internal Social Capital. We assessed the presence and strength of social capital within each school based on teacher reports. Internal social capital was measured using survey items based on Nahapiet and Ghoshal’s (1998) three facets of social capital: structural, relational, and cognitive. The structural facet of social capital was operationalized as information sharing among teachers and was measured using six items developed by Hyatt and Ruddy (1997) (Cronbach’s $\alpha = 0.89$). Although this metric does not provide individual-level information associated with network indicators of information sharing, at the level of the organization such network measures are often averages of single-item binary measures. Our multi-item Likert scale provided the advantage that it was a less resource-intensive approach to obtaining an organization-level indicator of information sharing. The relational facet of social capital was operationalized as trust among teachers. The trust measure consisted of six items adapted from previous work on trust conducted by Pearce et al. (1998, 1992) (Cronbach’s $\alpha = 0.88$). The cognitive facet of social capital was operationalized as shared vision among teachers. Six items were used to measure the degree of shared goals and vision present in the school. The first two items were adopted from Tsai and Ghoshal (1998), and the remaining four were adapted from Sinkula et al. (1997) (Cronbach’s $\alpha = 0.93$). For all social capital items, teachers were asked to report about the school as a whole rather than about their individual experiences within the school.

All scale items and correlations are shown in the appendix. The three dimensions of internal social capital—information sharing, trust, and shared vision—are highly correlated. We conducted a confirmatory factor analysis using AMOS 5.0 to examine the three-factor model linked to the second-order factor, which is our construct labeled social capital. The absolute fit indices for this model ranged from adequate to excellent (GFI = 0.958, IFI = 0.975, RMSEA = 0.05).² A model that did not permit covariance among information sharing, trust, and shared vision proved to be a poor fit (GFI = 0.83, IFI = 0.851, and RMSEA = 0.12). Moreover, the Akaike's Information Criterion Index (AIC, Boomsma 2000) was better for our hypothesized three-component model (AIC = 877 versus AIC = 3,954). We also explored a single-factor model. This proved to be a very poor fit (GFI = 0.71, IFI = 0.83, RMSEA = 0.13). Our empirical results thus suggest that the data structure fit our theoretical development of the social capital construct. Our internal social capital measure was created by averaging the level of information sharing, trust, and shared vision reported by teachers within each school.

A second question that arises is whether the aggregation of teacher assessments of social capital at the school level can be justified empirically. We generated intraclass correlation coefficients, ICC (1) and ICC (2), using ANOVA on the individual-level data with the school as the independent variable and the social capital constructs as dependent variables. Following the literature, an ICC (1) value that is positive with a significant *F*-statistic on the ANOVA test would suggest convergence within the schools (Kenny and LaVoie 1985). The ICC (1) for both the overall social capital construct, and its components—trust, shared vision, and information sharing—was greater than zero, and the *F*-statistic was significant. The ICC (2) values, which indicate the reliability of the school mean, were 0.85 for information sharing, 0.90 for shared vision, 0.88 for trust, and 0.91 for the overall internal social capital construct. Common practice suggests that values above 0.70 are good representations of the true scores for the schools, and all our values meet this threshold (Klein et al. 2000, James 1982).

External Social Capital. We measured external social capital by assessing, through time diaries, the relative amount of time on the job that principals spent interacting with stakeholders outside the school. The temporal context associated with completing time diaries helps ensure a more accurate reflection of work activities, and the time diary is generally considered to be a very good method to compare behavioral choices across individuals (Robinson and Bostrom 1994).

There are multiple decisions to make in assessing time-use choices, including the period to be covered, the time scales used to record activities, the activities identified as differentiating among types of time use, the start and end times of diaries, etc. Gershuny (2000) finds that

better estimates of individual behavior can be derived by examining a full rather than partial workweek. Based on discussions with the school district, we selected a week when there were no major districtwide events, student testing, or professional development programs. We then worked with our focus groups of principals from urban districts around the United States to develop initial time-use categories. We pretested the technology and refined the categories through discussion with the middle and top managers of the focal district. We then pretested the refined categories on a sample of five principals. The resulting pretest information was used to further improve the categories, as well as to develop appropriate groupings of activities.

We followed the standard time diary approach of limiting all reporting to one main activity for any time period (Robinson and Bostrom 1994). We found that principals—like many managers—multitask in their jobs. However, our pretests suggested that principals found it possible to select a dominant activity or work focus for specific periods. The resulting time-use accounts are thus mutually exclusive.

The variable length activities were aggregated by type and principal to develop comparable measures of how much time individual principals spent in total and on each activity. As can be seen in Table 1, principals spent 47.6 hours on average working over the five-day period.³ The standard deviation is more than 12 hours, however, and we found that principals in the lowest quartile worked an average of fewer than 37 hours per week, whereas those in the highest quartile worked an average of 61 hours per week. Given this variability, we wanted to be sure we were capturing relative effort expended on external activities and not just differences in overall hours spent working. Thus, in subsequent analyses we calculated the amount of time each principal spent on particular activities as a proportion of his or her total hours. This provided an indicator of the relative effort expended by each principal on external contacts.

On average, principals recorded slightly more than 60 activities in the same five-day period. The activities for each principal were aggregated by type based on the results of our pretesting. Three main activities were classified as linking the principal to external stakeholders: (i) activities centered on bringing extra resources into the school such as interactions with foundations and corporate sponsors, (ii) activities centered on parent relations such as meetings with parents or prospective parents, and (iii) activities focused on community relations such as participation in community events and town hall-type meetings with neighborhood residents. We found that principals in the district spent 13.7% of their time, on average, on external relations (*sd* = 7.5%). In our analyses, we use this measure, as well as the total time spent to control for the fact that some principals choose to spend much more time at work than others.

Table 1 Descriptive Statistics

Variables	Mean	Standard deviation
Percentage of students on subsidized lunch program	65.4	18.8
Teacher experience in district (1 = <1; 2 = 1–3; 3 = 4–5; 4 = 6–10; 5 = 11–15; 6 = 16+ years)	4.6	0.67
Internal social capital (5-point scale)	3.7	0.45
External social capital (% principal time on external matters)	13.7	7.5
Total time spent by principal on the job in 5-day week	2,856 minutes	733 minutes
Quality of instruction	3.94	0.28
Percentage of students who meet or exceed state standards for math achievement in 1999–2000	31.2	18.4
Percentage of students who meet or exceed state standards for reading achievement in 1999–2000	35.1	18.2
Percentage of students who meet or exceed state standards for math achievement in 2000–2001	35.2	19.8
Percentage of students who meet or exceed state standards for reading achievement in 2000–2001	38.7	22.3
Percentage of students who meet or exceed state standards for math achievement in 2001–2002	32.7	17.8
Percentage of students who meet or exceed state standards for reading achievement in 2001–2002	37.5	19.9

Outcome Measures. In the United States, school performance is increasingly assessed by examining student reading and mathematics achievement test scores. The NCLB Act required all states to develop achievement testing tied to standards for both reading and mathematics. Although other subject matters will be tested in the future under the law, the focus on mathematics and reading test scores as the primary means to evaluate school performance is prevalent nationwide in policy debates, as well as in scholarly analyses of school performance (cf. Leitner 1994, Linn et al. 2002). Schools that fall below mandated cutoffs in terms of the percentage of students achieving reading and mathematical proficiency are put on a probationary list and are required to show improvements in subsequent years if the school is to avoid future sanctions. These sanctions are significant and can take many forms, ranging from allowing students to enroll in other schools to, in the extreme, closing the school down. Not surprisingly, school administrators and teachers have become very sensitive to the need to achieve adequate student performance in reading and math.

In this research we used these two student achievement test scores: the percentage of students in the school attaining scores that meet or exceed state standards for (i) achievement in mathematics and (ii) achievement in reading. These particular ways of reporting student achievement are the methods used by the state and mandated as part of NCLB. All achievement tests were uniformly administered; their administration is mandated by the state. For elementary schools, the achievements tests were administered to all 5th graders, for middle schools to all 8th graders, and for high schools to all 11th graders. On average, fewer than 40% of each school’s students met or exceeded state standards in any given year.

There is considerable debate as to whether the absolute levels of school test performance or test performance improvement serve as a better indicator of school effectiveness (cf. Linn et al. 2002). In addition to absolute levels of performance, we examined performance change from the school year preceding our study (1999–2000) through the focal school year (2000–2001), and

the school year that followed our study (2001–2002). Thus, we are able to track change and also assess the extent to which internal and external social capital affect performance over time. Although only about one third of all students met or exceeded state standards (see Table 1), there was some improvement in scores for the district overall in the focal academic year. This may have been partially attributable to stricter enforcement of state sanctions against poorly performing schools, and the increased attention to student testing that accompanied this enforcement. There was no further overall improvement in the year following the study.

Mediating Variable. Our mediating variable is the level of quality of instruction provided in the school. We drew upon the parent survey undertaken by the district (discussed above) to generate an average quality of instruction score for each school. We relied on three items from that survey to assess instructional quality: parental satisfaction with the methods used to teach their child, parental satisfaction with the materials used to teach their child, and parental satisfaction with opportunities for learning for their child. The average parent rating on these items was 3.9 (sd = 0.28) on a five-point scale ranging from 1 = very dissatisfied to 5 = very satisfied. The Cronbach’s alpha for the three items was 0.94. The ICC (1) for the parent satisfaction scale was greater than 0 and the *F*-statistic was significant. The ICC (2) values, which indicate the reliability of the school mean, was 0.71, exceeding the generally accepted cutoff of 0.70 (Klein et al. 2000).

Control Variables. Previous research has shown student socioeconomic background to be a key determinant of a range of school outcome measures, including student achievement. Socioeconomic background of the student population has a major influence on student performance, independent of the quality of instruction in the school (Louis and Marks 1998). In this study, we controlled for the socioeconomic status (SES) of the student population by factoring into our analyses the percentage of students in each school receiving government-subsidized lunches. Lunches are free or subsidized when

students' family income falls below a minimal level. Like most urban districts in the United States, the majority of students in this district (two thirds) were eligible for government-subsidized lunches, although there was a good deal of variability across schools in the district.

We also controlled for teacher human capital. Human capital has played an important role in public policy debates regarding school and teacher effectiveness. Teacher certification, training, and continuous testing are central to many states' approaches to improving public schools (Cohen and Hill 2001). As part of the NCLB Act, teachers will need to be "highly qualified" by the 2005–2006 school year. This includes full state certification as well as evidence of mastery of subject matter. Although there is considerable debate regarding the relative merits of educational degrees and other indicators of teacher skill, the focus on teacher human capital dominates the policy discourse (Darling-Hammond and Youngs 2002).

We initially explored two standard indicators of human capital: (a) the educational attainment of the teachers and (b) teacher years of experience. Experience was measured using categories ranging from 1 (less than one year of experience) to 6 (more than 15 years of experience). In all 74% of the teachers had at least six years of experience teaching in the district. There was considerable variance in the average levels between schools, however, suggesting that experience was a discriminating measure of school-level human capital. We were not able to use the other standard measure of human capital—educational attainment—because of two problems. First, all but a few teachers had undergraduate degrees and 70% held master's degrees or beyond. Because the district under study had continuous education requirements and education-linked salary progression, we found a very high correlation between whether or not a teacher had a master's degree or beyond, and teacher experience (0.70). As a result, we decided to use only teacher experience as our control for human capital.

Results

Table 2 shows the correlations among the measures of internal and external social capital, quality of instruc-

tion, the control variables, and the student achievement measures. As expected, the control variables are significantly correlated with outcomes. Socioeconomic status (percent of students on government-subsidized lunch) is negatively and significantly correlated with student achievement in both math and reading. Teacher experience is positively and significantly correlated with student performance in math and reading. Teacher experience is also positively related to internal social capital. Surprisingly, the correlation between experience and instructional quality is weak and not statistically significant. The correlations also suggest that student socioeconomic status is not related to parents' satisfaction with instructional quality. This suggests that parents' assessments do not significantly vary based on school SES—a factor commonly associated with levels of parental expectation—which gives us more confidence that our measure of instructional quality actually reflects parents' assessments regarding instruction in the school rather than other factors such as parent demographics.

Both internal and external social capital are significantly correlated with student achievement test scores in math and reading, providing initial support for H1 and H2. The correlations are highest for the year under study, but both forms of social capital continue to be positively correlated with student performance for the subsequent school year. Internal and external social capital are positively and significantly correlated with instructional quality, which in turn is also positively and significantly correlated with student achievement. There is no significant relationship between socioeconomic status and instructional quality or either form of social capital.

In Table 3 we show the relationship between social capital and student achievement using hierarchical regression procedures. We examine first the relationship between the controls and student achievement in math and reading. As expected, low student socioeconomic status has a negative influence on student achievement. Teacher experience has a positive impact on student achievement in reading but not in math.

We then explore the additional explanatory power offered by the measures of internal and external social capital. We also entered here a variable representing the

Table 2 Correlations

	1	2	3	4	5	6	7	8	9
1. Subsidized lunch									
2. Teacher experience	−0.38**								
3. Internal social capital	−0.18	0.23*							
4. External social capital	−0.17	0.11	−0.02						
5. Principal total time	0.17	−0.26*	−0.03	−0.15					
6. Quality of instruction	−0.05	0.14	0.46**	0.31**	−0.11				
7. Math score 2000–2001	−0.57**	0.37**	0.43**	0.23*	−0.23*	0.42**			
8. Reading score 2000–2001	−0.49**	0.40**	0.50**	0.25*	−0.07	0.39**	0.78**		
9. Math score 2001–2002	−0.58**	0.28*	0.25*	0.28*	−0.18	0.40**	0.76**	0.72**	
10. Reading score 2001–2002	−0.66**	0.42**	0.38**	0.27*	−0.13	0.34**	0.70**	0.85**	0.83**

* $p \leq 0.05$, ** $p \leq 0.01$.

Table 3 Regression Results

	Math achievement test scores		Reading achievement test scores	
Controls				
Subsidized lunch	-0.53**	-0.46**	-0.40**	-0.31**
Teacher experience	0.17~	0.07	0.24*	0.16~
Predictors				
Internal social capital		0.30**		0.40**
External social capital		0.18*		0.24**
Total time by principal		-0.08		0.09
<i>F</i>	24.8**		16.4**	
Change in <i>F</i>		5.5**		9.6**
Adjusted <i>R</i> square	0.37	0.46	0.27	0.45

~ $p \leq 0.10$, * $p \leq 0.05$, ** $p \leq 0.01$.

principal's total time spent on the job in order to test for possible differences in performance attributable to the amount of time the principal spends at work. Here we found that both forms of social capital have a positive influence on performance. The social capital measures add significant power to the model, explaining an additional 9% of the variance in math scores and 18% of the variance in reading scores.

These results suggest that internal and external social capital are significantly related to student test scores, but they do not address the direction of causality. Does higher social capital among teachers lead to better student performance or do superior test results induce higher levels of internal social capital? Similarly, does principal effort toward building external relations help to enhance student learning or do superior test results allow principals more discretionary time to spend on external matters? To examine these questions, we use longitudinal data on student performance. In Table 4, the dependent variables in the first two sets of regressions are the average math and reading achievement test scores for the school in 2000–2001. Because there was not a substantive change in the control variables between the two years, we estimated the equations with the 1999–2000 test scores as control variables and the 2000–2001 outcomes as dependent variables. In this way we control

for unmeasured influences on achievement. As shown in Table 4, in the case of math scores we found that internal social capital was a significant predictor of test scores in 2000–2001. In the case of 2000–2001 reading scores, we found that both internal and external social capital were significant predictors. To test whether the performance improvements associated with social capital are sustained over time, we reran the regressions for the 2001–2002 school year. Whereas the influence of internal and external social capital is positive for both math and reading performance, the results are only significant for reading. The data on social capital measures were collected more than a year earlier than the 2001–2002 test score data, providing some evidence of temporal causality.

We conducted a final analysis to explore if instructional quality mediates the relationship between social capital and student achievement in math and reading (H3 and H4). Here the argument is that internal and external social capital do not directly affect student achievement but instead operate through the mediating effect of teacher instruction. We tested for mediation following the four-step procedure outlined in Baron and Kenny (1986; see also Judd and Kenny 1981). In Table 3, we showed that both forms of social capital significantly predict student achievement in math and reading scores. In the first set of regressions in Table 5, we show that both forms of social capital are also significant predictors of instructional quality. When the achievement regressions are rerun with instructional quality as a predictor rather than as an outcome, we find that instructional quality is a significant predictor of student achievement in math, but that neither form of social capital has a significant influence on math achievement. Thus, instructional quality fully mediates the relationship between social capital and student achievement in math. Instructional quality, when entered alone, is also a significant predictor of reading achievement. However, when the social capital measures are added into the model predicting reading outcomes, they are sig-

Table 4 Changes in Test Scores over Time

	Math scores 2000–2001		Reading scores 2000–2001		Math scores 2001–2002		Reading scores 2001–2002	
Controls								
Test score in 1999–2000	0.87**	0.79**	0.75**	0.61**	0.77**	0.71**	0.78**	0.66**
Predictors								
Internal social capital		0.19**		0.27**		0.12		0.24**
External social capital		0.06		0.17**		0.09		0.15*
Total time by principal		-0.07		0.03		-0.01		-0.04
<i>F</i>	249.5**		104**		108.7**		115.5**	
Change in <i>F</i>		4.6**		5.7**		1.3		5.4**
Adjusted <i>R</i> square	0.75	0.78	0.56	0.62	0.59	0.59	0.60	0.66

~ $p \leq 0.10$, * $p \leq 0.05$, ** $p \leq 0.01$.

Table 5 Instructional Quality and Mediation

	Instructional quality		Math achievement test scores		Reading achievement test scores	
Controls						
Subsidized lunch	−0.02	0.09	−0.51**	−0.48**	−0.38**	−0.32**
Teacher experience	0.11	−0.01	0.14	0.09	0.21*	0.18 ~
Predictors						
Instructional quality	NA	NA	0.38**	0.28**	0.36**	0.19 ~
Internal social capital		0.47**		0.16		0.30**
External social capital		0.31**		0.09		0.18*
Total time by principal		−0.06		−0.06		0.11
<i>F</i>	0.6		28.8**		19.0**	
Change in <i>F</i>		10.8**		1.2		4.4*
Adjusted <i>R</i> square	0	0.26	0.50	0.51	0.40	0.47

~ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

nificant predictors of reading performance but instructional quality is not significant. Thus, the analyses did not show mediating effects when the performance measure was reading achievement. Following Baron and Kenny's (1986) approach, we did a *t*-test for mediation and confirmed that instructional quality significantly mediates the relationship between internal and external social capital and student achievement in math but not in reading.

Discussion

In this study we found that social capital plays an important role in predicting organizational performance in urban public schools. Our results show that internal and external social capital are important determinants of student achievement test scores in both reading and math, and are also important predictors of instructional quality. As predicted, instructional quality fully mediated the relationship between social capital and math achievement but, contrary to our hypotheses, did not mediate the relationship between social capital and reading achievement. Instead, both forms of social capital have direct effects on reading achievement. This result initially surprised us, but a closer reading of the education literature suggests that there are fundamental differences in the role of collective efforts to improve mathematics versus reading instruction. In particular, Burch and Spillane (2003) suggest that collective efforts to improve mathematics education typically center on specific instructional practice and content, whereas efforts to improve reading scores are frequently broader, to embed and support reading across a range of content areas. They also report that such efforts are often centered more on soliciting teacher involvement and input on literacy than on fostering particular teaching practices. This might explain why the effects of social capital on reading are direct, whereas these effects are channeled through instructional practice for math achievement. Overall, these differences in findings between social capital

and student achievement are consistent with previous research, which suggests that the nature of the task may be an important moderator of the effects of social capital on performance (e.g., Hansen 1999).

We found some evidence that human capital, specifically teacher experience, had a positive effect on student achievement. However, in our multivariate analyses, we again found differences in reading and math achievement, with teacher experience significantly predicting student achievement in reading but not math. Again, a closer examination of the education literature offers an explanation for these findings. Mathematics teaching has changed dramatically in recent years, shifting in many locations to so-called reform models of pedagogy (Huntley et al. 2000, Schoenfield 2002, Thompson and Senk 2001), whereas instructional practice in reading has not undergone so dramatic a shift. As a result, experience in teaching math does not necessarily impart the advantage one might expect.

Principals' efforts at building external relations were shown to be beneficial but the multivariate analyses showed no significant relationships between the amounts of time principals spend at work and student achievement. Thus, although the principals' relative efforts at building external social capital appear to be a good use of time in terms of enhancing student achievement—even if these effects are not as strong as those found for internal social capital—the total time spent on the job was generally not important.

This research makes several contributions to the literature on social capital. First, we simultaneously examined internal and external social capital across a relatively large sample of organizations. Our findings support a model of social capital whereby internal and external relations are important contributors to organizational performance. This suggests that future research studies of social capital should examine both forms if we are to understand the complexity of social capital effects. Second, as noted earlier, some previous studies of social capital have similarly examined internal and external

relations, but these have tended to be conducted within a single or at best small set of organizations where the subunit or work group is the focus of analysis rather than the organization as a whole (e.g., Hansen 1999, Tsai and Ghoshal 1998). The results of our research support the findings of these earlier studies but within a different setting—urban public schools—and using data collected at the organizational level rather than at the level of the work team or subunit. These results suggest that the benefits of social capital shown in studies at the level of the work group are robust and can be realized at the organizational level, as well.

Third, we developed several new methods in this research for assessing social capital. Our survey of internal social capital may be used in future research across similarly large or larger samples of organizations. We believe that our PDA methodology shows great promise as a tool for assessing activities across a large sample of managers. We also collected data from different sources—managers, employees, and external stakeholders—and were able to objectively compare performance outcomes across the organizations in our study. These provided a particularly rigorous test of our hypotheses.

Our results show little support for the human capital explanations of school performance. Although our measure is a relatively crude one, it does highlight the importance of a nuanced exploration of teacher human capital and its relationship to social capital—particularly in light of the current focus on teacher preparedness both in the education literature and in public policy debates about school performance.

Finally, several researchers have convincingly made the case for the importance of context in studies of organizational behavior. Clearly social capital is a context-specific phenomenon, both influencing and being influenced by the nature of work and organizational structure and processes. In this research, we examined social capital in context. We developed measures that focused on the specific jobs and organizations in which both the managers (i.e., principals) and front-line employees (i.e., teachers) carried out their work. Doing this required spending extensive time within schools, in-depth interviewing of individuals at all levels of the school and district, and extensive pretesting of our instruments. The benefits of such an approach in the study of social capital, however, are well worth the costs, in our view.

Although these findings are significant for both organization and education research, there are three primary limitations of our research. First, in terms of generalizability, the research was conducted in a nonprofit setting rather than the for-profit settings in which many recent studies of social capital have been conducted. This potential drawback in terms of generalizing to the for-profit sector may be partially offset by the particular characteristics of U.S. public school systems at this

stage in their history. Like many firms, public schools are under intense pressure to perform, both in absolute terms and in relation to their competitors in the private sector. Moreover, similar to many firms in the for-profit sector, knowledge use and diffusion are central activities. Third, school performance is increasingly being assessed based on the results of uniform testing across schools, thus increasing the short-term performance pressure on individual schools. In these regards schools are increasingly being held to objective standards of performance like for-profit firms. Moreover, schools offer a unique advantage as research sites because, within a district, they are homogenous on many fronts, facilitating their use in organization-level analysis.

A second potential limitation of this research concerns the measures used. In several previous studies of internal and external social capital, social network analysis has been used to assess these variables (e.g., Hansen 1999). Moreover, authors such as Burt (2000) have argued for the superiority of network measures in research on social capital. In this study we did not use network measures. With regard to external social capital, we wanted to assess external activities—not in isolation, but in relation to other important activities by managers. The PDA methodology that we used proved to be a relatively efficient way to collect behavioral data in real time and allowed us to assess a diverse range of activities and interactions for a large number of managers without relying on retrospective reports. This activity-based perspective provides a valuable alternative to more traditional network tools, in that it permits the exploration of how much time and effort key actors spend on working ties relative to other activities.

In terms of internal social capital, it is not clear that a network measure (using, for example, a standard roster method to assess the density of the advice network within each school) would yield superior information about school-level social capital. Such a network approach would require aggregating individual reports to arrive at a school-level score, much as we have done here with our six-item scale. Moreover, we found in pretesting that we could not achieve reasonable response rates using a network roster method. Respondents were reluctant to provide such information both because they did not feel comfortable assessing their relationships with co-workers, and because they worried that such information might compromise their anonymity. One advantage of our approach, then, is that it is significantly less resource intensive than some alternative approaches, and it is more likely to result in higher response rates across large numbers of organizations than traditional network metrics. Moreover, our performance measures, as well as our mediator, were developed from different sources, so the social capital findings cannot be attributed to common method bias. It would be useful in future studies, however, to measure the concordance of network and

nonnetwork measures in assessing organizational social capital.

Finally, in organizational research there is increasing use of multilevel designs to better capture the multilevel phenomena that make up life in organizations. The data in this study did not allow for multilevel modeling because data were not available on student achievement scores except at the aggregate level. However, future research in school settings should provide more opportunities for such multilevel analysis because, in the interest of public transparency, federal legislation now requires schools to test student achievement in multiple grades and to report test scores in a less aggregated form.

In terms of future research, we have several suggestions. Our findings here highlight the importance of examining both internal and external social capital as drivers of performance across a large number of organizations. A longitudinal exploration of the relationships identified here might be helpful to identify the precursors and other enabling factors for social capital. Likewise, an examination of the structural organization of tasks, time, and other resources within the organization, and the links to internal social capital, may provide insights into how social capital can both be fostered and leveraged for organizational advantage. Third, our measures of social capital should be validated against network measures, if possible, to better assess their validity. Fourth, our measure of instructional quality is not as rich as the qualitative assessments more commonly used in education research so it provided general rather than nuanced information about the multidimensional nature of that phenomenon. Future research may develop a richer measure of the classroom activity and practices that comprise this construct that can be used over a large number of schools and classrooms as we did in this research. Fifth, there are a myriad of factors that are related to student achievement at various levels of analysis (e.g., student family situation, textbooks, school facilities, principal leadership, etc.). We could not incorporate all such factors in this analysis; future researchers may wish to broaden their inclusion of such phenomena at their respective levels of analyses in their studies. Finally, we have focused on the organization as a whole as the unit of analysis. However, intraorganization variation in the constructs can be considerable, and it would be instructive to explore some of the other levels at which social capital plays out. There are multiple communities, for example, in which teachers can participate, even within a single school. Moreover, teachers as well as principals can make external linkages that are important for improving student achievement. Understanding the overlapping influences of these communities and roles can further enhance our knowledge of social capital and its effect on student achievement in schools, as well as its more general relation to organizational performance.

Appendix. Internal Social Capital Scale

Items

1. Information sharing—Cronbach's alpha = 0.90
 - Teachers engage in open and honest communication with one another.
 - Teachers at this school have no hidden agendas or issues.
 - Teachers share and accept constructive criticisms without making it personal.
 - Teachers discuss personal issues if they affect job performance.
 - Teachers willingly share information with one another.
 - Teachers at this school keep each other informed at all times.
2. Trust—Cronbach's alpha = 0.88
 - I can rely on the teachers I work with in this school.
 - Teachers in this school are usually considerate of one another's feelings.
 - Teachers have confidence in one another in this school.
 - Teachers in this school show a great deal of integrity.
 - There is no "team spirit" among teachers in this school (reversed).
 - Overall, teachers at this school are trustworthy.
3. Shared vision—Cronbach's alpha = 0.93
 - Teachers share the same ambitions and vision for the school.
 - Teachers enthusiastically pursue collective goals and mission.
 - There is a commonality of purpose among teachers at this school.
 - Teachers at this school are committed to the goals of the school.
 - Teachers view themselves as partners in charting the school direction.
 - Everyone is in total agreement on our school's vision.

Correlations among internal social capital components	Info. share	Trust
Information sharing		
Trust	0.75**	
Shared vision	0.63**	0.69**

* $p \leq 0.05$, ** $p \leq 0.01$.

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Endnotes

¹A fully accurate response rate cannot be calculated for this survey because of the methods used. For each school, the district mailed surveys to all families of school-age children

living within the geographic boundaries of the school's service area, with instructions that the survey should only be completed if the family had a child enrolled in the school. Since many students attend private schools or magnet schools rather than their home school, many households receiving the survey had no children enrolled in the school. Also, we did not have information on siblings for students enrolled in each school so we were not able to accurately assess the response rate based on a comparison of the total number of students in the school and the number of surveys returned. If we divide the number of parental surveys received by the number of children in the district, and adjust for the average number of school-age children in households with children in the district from the 2000 census, we can derive a very conservative estimate of the response rate as approximately 23%.

²As is typical in confirmatory factor analysis, the chi-square in this model was significant (Kelloway 1998). However the RMSEA did not exceed the 0.06 to 0.08 cutoff generally recommended in the literature (Browne and Cudeck 1993, Hu and Bentler 1999).

³We excluded weekend work hours because our interviews of middle managers and principals in the district suggested that these hours were highly variable and thus not a good indicator unless data were gathered across multiple weekends.

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