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Laying the Foundation for Employment: The Role of Social Capital in Educational Achievement

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Abstract

This paper examines the role of social capital — the set of supportive interpersonal interactions that exists in the family, community, and school — in promoting educational achievement. Employing data on public school students from the National Education Longitudinal Survey (NELS) and other secondary data sources, we examine the link between students' access to social capital and important educational benchmarks, especially standardized test scores for math and reading. Building on previous research, we attempt to refine the conceptualization and measurement of social capital. We then undertake a new exploration of test score gains realized by students over the course of the 8th to 12th grades in order to assess the extent to which social capital attributes of the family, school, and community contribute to such gains. Finally, we outline the implications of our findings in guiding education policy activities in rural America.

Keywords: Academic achievement; Community; Rural development; Social capital

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1. INTRODUCTION

Unlike past decades, the creation of vibrant and sustainable economies in rural America is becoming increasingly tied to the educational credentials and training skills of the local workforce (Aldrich and Kusmin 1997; Gibbs, Swaim, and Teixeira 1998; McCall 1997). Increasingly, firms are settling in rural areas that have a sufficient pool of well-educated workers or a labor force capable of learning needed skills (Gale, Wojan, and Olmsted 2002; McGranahan 2002). At the same time, such firms want localities that take the education of their children seriously — places that invest in the education of tomorrow's workforce. Moreover, communities that have an excellent education system are better positioned to stem the out-migration of young, talented residents and are better able to attract in-migrants with strong human capital attributes (Barkley, Henry, and Shuming 1998).

If excellence in educational achievement, individually and collectively, is a key ingredient in promoting rural prosperity, then understanding the factors that contribute to achievement is crucial. For example, past research, such as the often-cited Coleman Report released nearly four decades ago, noted that family socioeconomic status (SES) has a powerful impact on student achievement (Coleman et al. 1966) and argued that educational outcomes are affected by factors present within and outside the school environment. Thirty years later, Lerner (1995) noted those public investments in families and community organizations were as vital as those targeted to schools in promoting student achievement.

An expanding body of work suggests that social capital — the set of supportive interpersonal interactions that exists in the family, community, and school — plays a decisive role in promoting educational achievement. Social capital has been applied by an array of researchers to study educational outcomes (see Coleman 1988; McNeal 2001; Morgan and Sørensen 1999; Parcel and Dufur 2001; Teachman, Paasch, and Carver 1997). In this context, social capital exists in the extent, quality, and application of relationships that advance or hinder the educational process.

This article offers a reformulation of the links between social capital and educational outcomes. It seeks to refine the conceptualization and measurement of social capital attributes that might have bearing on the educational progress of young people. This is realized by controlling for native abilities of students as well as the pool of resources available to families, schools, and communities that can impact student performance. By doing so, we are better able to isolate the key features of families, schools, and communities that shape the level of social capital in these settings. We argue that the nature and strength of social capital has direct bearing on the educational success of school-aged children.

Using a sample of public school students from the National Education Longitudinal Survey (NELS), we estimate the unique contributions of family, school, and community social capital attributes to achievement in 8th grade, measured through standardized test

scores administered as part of the NELS. We also examine test score gains realized by students between their 8th and 12th grades. This is undertaken to determine whether and to what extent family, school, and community social capital factors contribute to these gains. The final section of this article discusses the implications of our findings, giving special attention to the set of educational policies that can help to improve the social and economic prospects for communities in rural America.

2. DETERMINANTS OF EDUCATIONAL ACHIEVEMENT

2.1 Innate Abilities and Other Background Attributes that Impact Learning

Over three decades ago, Duncan, Featherman, and Duncan (1972) noted that certain ascribed statuses affect the life chances of individuals. These include race, ethnicity, and gender. According to Coleman (1988), these factors constitute the disadvantages of background. Recent works such as the volume by Flora, Flora, and Fey (2004) suggest that legacies of gender, race, and ethnicity continue to shape the educational aspirations that parents have for their children, or the expectations that teachers have for their students. Beyond these background attributes, students vary according to innate cognitive ability. Gifted students, for example, are better positioned to enroll in higher-level courses (e.g., advanced math courses) that have important bearing on their test scores. Moreover, academic performance in prior grades has much to say regarding the student's subsequent success.

2.2 Available Resources and Student Opportunities

The level of resources available to students at home, in school, or in the community, can "complement, reinforce, and add to their school experiences" (U.S. Department of Education 2003, p.73). These include the availability of books, a home computer, Internet access, personal tutors, and other educational products or activities. Other investments by parents include enrolling children in music classes, visiting museums, or taking part in other cultural activities (Downey 1995; Schneider 1993). As resources available to children in the home increase, the academic performance and school completion rates of these students improve (Coleman et al. 1966; Downey 1995; Israel, Beaulieu, and Hartless 2001; U.S. Department of Education 2003; Teachman, Paasch, and Carver 1997).

The level of monetary resources available to schools can have an impact on the learning environment and educational achievement (Greenwald, Hedges, and Laine 1996; Mortimore et al. 1988; Wenglinsky 1997). Resources affect the quality of school buildings, equipment for classrooms, books, and other instructional resources as well as teacher salaries (Stockard and Mayberry 1992; Turner et al. 1986). While some studies show little relationship between expenditures and achievement, the linkage is more apparent when resources are focused on specific programs (Arum 1998; Stockard and Mayberry 1992).

The level of resources available to support schools is inextricably linked to the financial resources that communities are willing or able to dedicate to their schools. Localities with greater socioeconomic capacity can support a variety of institutions and organizations that help meet the daily needs of its citizens and have a cadre of people with extensive experience, knowledge, and expertise to guide local activities or to attract quality jobs. Furthermore, such communities often have greater access to outside resources to help deal with an array of community issues (Luloff and Wilkinson 1979).

In most instances, the socioeconomic capacity of rural areas has lagged behind that of suburban and urban areas. Lower-skilled, low-paying production jobs have been concentrated in rural areas, while more highly skilled managerial and technical positions have clustered in urban places (Hobbs 1995; Jensen and McLaughlin 1995). Low-capacity rural towns, where educational attainment, income levels, job skills, and community engagement are more limited, can create a milieu that does not place a high priority on education. This may reduce rural students' educational achievement and aspirations relative to those of urban and suburban students (Cobb, McIntyre, and Pratt 1989; Smith, Beaulieu, and Seraphine 1995).¹

2.3 Social Capital and Student Achievement

A number of recent studies have shown that the nature and level of social capital accessible to students can promote educational achievement (Beaulieu and Israel 1997; Israel, Beaulieu, and Hartless 2001; Smith, Beaulieu, and Israel 1992; Smith, Beaulieu, and Seraphine 1995). Social capital refers to what Coleman (1990, p.334) describes as the set of norms, social networks, and relationships between children and their families, schools, and communities that are of value as they grow up. Expanding on Coleman's notion of social capital, Stockard and Mayberry (1992, p.74) note that "it involves obligations, behavioral expectations, and trust that develop from strong ties among individuals in a group, channels of information that help people be more informed, and norms of effective sanctions that facilitate and constrain certain actions."

Smith, Beaulieu, and Seraphine (1995) further elaborate Coleman's notion of social capital by suggesting that it embraces both structure and process features, elements that work in a complementary fashion to condition the environment for educational achievement. *Structure*, for example, determines the opportunity for, as well as the frequency and duration of, interpersonal interactions. *Process*, on the other hand, represents the level of involvement of individuals or institutions in the lives of youth. Both structure and process aspects of social capital can be found in the family, school, and community.

¹According to Hobbs (1995), many rural communities cannot fully capture the benefits of their investments in children because many of the best students leave the community upon graduation from high school. This situation creates a disincentive for rural communities because urban and suburban areas benefit from their investments (Hobbs 1995; Lichter et al. 1993). As one anonymous reviewer noted, many communities choose to invest in the education of their youth anyway. This might be because residents place a high value on education or perceive that retaining some well-educated youth is better than having all youth with low educational attainment.

2.3.1 Family Social Capital

Structural characteristics of the family that can influence the emergence of social capital include the presence of one or both parents in the home and the number of siblings. These factors dictate the opportunity for interpersonal interactions to occur between parents and children and shape the frequency and duration of such interactions (Smith, Beaulieu, and Seraphine 1995). Intact families have a positive influence on the academic success of their children (Bogenschneider 1997; Coleman 1990), while the presence of many siblings can dilute the amount of time that parents can devote to any single child (Blake 1981; Downey 1995).

The process aspects of family social capital are demonstrated by the quality of parents' involvement in the lives of their children. These include parents' nurturing activities, such as helping children with their homework, discussing important school activities with them, and expressing high educational aspirations for them (Downey 1995; Teachman, Paasch, and Carver 1997). It also includes sponsoring and participating in other activities that help develop a child's competence and confidence.

Process features of family social capital also include constraining activities, such as limiting television viewing, providing adult supervision when the children return from school, and monitoring homework (McNeal 1999). Though constraining activities are a necessary part of child rearing, relationships that are abusive or neglectful can erect barriers to educational achievement.

2.3.2 School Social Capital

Structural components of schools that can impact the quality of social capital include the socioeconomic and demographic background of the student population, the number of students enrolled in the school, and the nature of the learning climate in the school or classroom (Stockard and Mayberry 1992).

Students in schools whose enrollment is drawn primarily from high socioeconomic status families and who interact with high-status peers, have higher achievement on average, in part because students attending higher SES schools are more likely to establish friendships with individuals having good learning skills and high educational aspirations (Stockard and Mayberry 1992; Blau 1960; Coleman et al. 1966). At the same time, higher status schools are likely to have well-articulated norms and values that encourage good academic performance and limit problem behaviors (Alexander and Eckland 1975; Friedkin and Neocochea 1988; Hoffer, Greeley, and Coleman 1987; Rutter et al. 1979).

Closely linked to the socioeconomic context of the school is race and ethnicity. Schools comprised mainly of white students are more likely to be drawn from middle-class areas, while those that are more racially and ethnically diverse are more likely to be drawn from lower socioeconomic status families and neighborhoods (Stockard and Mayberry 1992).

School size (number of enrolled students) is commonly linked to student achievement. To some, larger schools promote higher achievement since they can offer students a richer set of course offerings, have better trained and qualified teachers, and have a more diverse set of educational support services (Ballou and Podgursky 1998; Greenberg and Teixeira 1998). Others argue that smaller schools are better academically because of lower student-teacher ratios, the greater attention by teachers to the needs of their students, the higher rates of participation in school activities, and the lower rates of absenteeism (Greenwald, Hedges, and Laine 1996; Gregory and Smith 1987; Hobbs 1995; Lee and Smith 1996; Rossi and Daugherty 1996; Sher 1988; Walberg and Fowler 1987).

Among the process components of school social capital is the active engagement of teachers and parents in the lives of students (Hoffer, Greeley, and Coleman 1987; Lee and Smith 1996; Rutter et al. 1979). Relevant activities include teachers' interest in the welfare of students through positive teacher/student interactions and efforts to engage students in school programs and activities that help integrate them into the life of the school (Flinn and Rock 1997). Students who perceive teachers as having a caring attitude and who see these individuals as role models are more inclined to want to succeed in school (Noddings 1988; Werner and Smith 1989).

Students whose parents are involved in their school, through parent-teacher organizations and booster groups, perform better in their academic courses and are less likely to drop out of high school (Eccles and Harold 1993; McNeal 1999; Parcel and Dufur 2001; Stevenson and Baker 1987; Walberg 1984). While many activities are nurturing, others serve to constrain undesirable behavior. Thus, parental contact with teachers or school administrators and between teachers and students concerning academic or behavioral concerns can indicate academic difficulties and lower achievement (McNeal 1999).

2.3.3 Community Social Capital

Localities with high community social capital are marked by extensive civic engagement and patterns of mutual support (Putnam 2000; Wilkinson 1991).² Community activeness builds social capital since the network of relationships that develop from past local activities can be tapped whenever new efforts to address educational or other community needs are initiated (Zekeri, Wilkinson, and Humphrey 1994). *Structural* features of a community that can boost the creation and accumulation of social capital include *proximity*, *stability*, and *equality* (Israel, Beaulieu, and Hartless 2001). Physical proximity increases opportunities for interactions among local residents that build community bonds. Residents living in the sparsely populated rural countryside incur the added cost of space in maintaining social networks, especially the "weak ties" comprised of more transitory interactions that underpin much of community interaction (Granovetter 1973; Wilkinson 1991).

² Social capital also can accumulate within any local group or organization and thus can be used to further the private interests of that group, sometimes to the detriment of other groups in the community (see Flora 1998; Wall, Ferrazzi, and Schryer 1998).

Residential stability contributes to the emergence of strong local links because communities with low residential turnover have ample opportunities to develop relationships that can be used to coordinate community improvement activities and to build community social capital (Putnam 2000). With regard to education, children who move frequently have relationships disrupted at each instance and are hampered in establishing long-term relationships with individuals in the community (Smith, Beaulieu, and Seraphine 1995).

Finally, *equality* can reduce social divisions that affect the quality of interaction (Blau 1994). Insofar as certain racial or ethnic minorities have less access to a locality's resources, such disparities can become the basis for durable cleavages between a community's elites and disadvantaged groups, particularly when local priorities are being determined. When residents feel alienated, participation in local affairs declines and collective action is fragmented. One outcome of high inequality is that less social capital is available to improve local education.

The *process* components of community social capital can be demonstrated by the level of interest and caring that adult members of the community have for the welfare of each other's children and by the efforts of individuals and organizations to engage children in community programs and activities that make effective use of their time and energy (Coleman and Hoffer 1987; Smith, Beaulieu, and Seraphine 1995). When these activities involve adults with higher levels of educational attainment, youth are immersed in an environment that encourages educational achievement.

3. METHODOLOGY

The analysis is based on data collected as part of the National Educational Longitudinal Study (NELS) conducted by the National Opinion Research Center for the National Center for Education Statistics. The initial survey, conducted in 1988, involved a stratified national probability sample of more than 1,052 schools (815 were public schools). A sample of 8th grade pupils was surveyed from each of these schools, yielding a total of 24,599 usable responses. Students provided information on individual and family characteristics, school experiences, participation in extracurricular activities, and future plans. Linked to the student surveys were nearly 22,700 parent surveys with information on family characteristics, parents' views of their children's school experiences, and expectations for their children.

Data from the School District Data Book (SDDB) and the Common Core of Data (CCD) files developed by the National Center for Education Statistics were linked with the privileged version of the NELS data.³ We merged 1990 census data describing community structural attributes with the 1988 NELS data. Finally, we incorporated county typology codes from the Economic Research Service and voter participation data

³ The privileged version includes geographic codes that are not available in the public data. These codes allow school district and county census data from other sources to be combined with the NELS data.

from the Inter-University Consortium for Political and Social Research. Though the overlap and hierarchy of school, school district, and county differ across states, we treated these variables as a single level in our analysis.

This study was limited to students in public schools with at least 10 students surveyed with usable data. After selecting students having full data on the variables of interest, the analysis included 9,199 students enrolled in 687 public schools in the 8th grade. The number of students included in our analysis of gains scores over the 8th to 12th grades declined to 5,612 due to attrition. To minimize problems with the decline in sample, we used weights to ensure the representativeness of the various sub-populations engaged in this study (Ingels et al. 1998).

3.1 Measurement of Variables

Increasingly, achievement in primary and secondary school is linked to students' progress as measured by school-administered standardized exams (Amrein and Berliner 2002; Kohn 2000). While the validity and meaning of such test scores continues to be hotly debated, there is little question that their greatly expanded use is changing contemporary education policies and practice. Five dependent variables are employed in our analysis. Three were 8th grade test scores: the math/reading composite, math IRT test score, and reading IRT test score. The remaining two examined math and reading gain scores between the 8th and 12th grades.⁴

The first dimension of our model includes independent variables that were designed to capture the students' innate capabilities and other background factors. Race and gender variables are included because blacks are more likely than whites to leave school and females are less likely to attend college (Ekstrom et al. 1986; Smith, Beaulieu, and Seraphine 1995). To capture the intellectual abilities of each child and the child's engagement in learning, we add six variables to the model — whether the student is classified as gifted; the child's grade point average in middle school; the student's readiness for class; hours spent doing homework during the week; student engagement in the classroom (based on teacher's ratings); and student's interest in, and expected future value of, math and English. These, along with taking advanced courses (Algebra 1), high attendance (based on incidence of tardiness, skipping, and being absent), and disruptive behavior in the classroom (measured from the teacher's perspective), were seen as factors that would likely affect academic success.

The next major dimension of the model includes variables for the level of resources available to students in their homes, schools, and communities. Certainly, children from higher socioeconomic status families are likely to do better academically because of the more diverse set of resources that can be tapped to facilitate learning (Coleman et al.

⁴ The gain scores are based on the difference between IRT test score for each grade and subject. Details about the variables and coding scheme employed for this study are available from the senior author.

1966; U.S. Department of Education 2003). To capture this aspect of the family, we include two key variables in our analysis – family income and whether one or more parents had a college education.

To assess the level of financial assets made available to support the educational activities of schools, we incorporate “core school expenditures on a per student basis” into our model. While past studies have been inconclusive, there is some evidence that higher per student expenditures can have a positive impact on student achievement (Greenwald, Hedges, and Laine 1996). At the community level, we capture local socio-economic capacity through the use of a county-level composite measure based on six interrelated items: poverty rate, median income, employment diversity, concentration of wealth, percent of unemployed households, and the mean level of education.

The final dimension of our model is the set of structural and process social capital attributes of the students’ families, schools, and communities. Within the context of the home, we focus on two structural measures: parental structure (i.e., the presence or absence of both parents in the home) and the number of siblings. The process aspects of family social capital are captured by five variables: nurturing activities (parents express expectations to the child about attending college; child discusses school matters with parents) and monitoring activities (how much parents limit TV viewing, how often parents check the child’s homework, and the amount of time that the child is home alone after school). These variables have shown strong effects on educational outcomes in earlier studies (Beaulieu et al. 2001; Downey 1995; Israel, Beaulieu, and Hartless 2001; McNeal 1999; Smith, Beaulieu, and Seraphine 1995; Teachman, Paasch, and Carver 1997).

Several structural measures of school social capital are included: the number of students enrolled in the school, the school’s minority percentage, the percent of students enrolled in the free and reduced price lunch program, average daily attendance rate, and school climate. A four-item index measuring a school’s dedication to academic excellence serves as our proxy for school climate. The size of the student body, its demographic and economic characteristics, and the school’s commitment to academics represent important factors that can influence educational aspirations and expectations of students (Friedkin and Neocochea 1988; Stockard and Mayberry 1992).

Three process measures of school social capital are used to measure the extent of a student’s social integration in the school. These include the number of organizations in which students are involved, the amount of discussion between students and their teachers outside of class, and the extent to which students view their teachers as nurturing individuals. Students actively involved in school organizations tend to thrive academically (Flinn and Rock 1997), while those requiring frequent monitoring and corrective instructions are less inclined to stay in school.

Three additional school social capital attributes included in our model are parental involvement in the school’s parent-teacher organization (PTO), parents’ participation in

other school organizations, and frequency of parental contacts with the school on matters associated with academics, discipline, fund raising, and so on.

Following Israel, Beaulieu, and Hartless (2001), the structural attributes of the community include measures of proximity, stability, and equality. Proximity is measured with a county typology (metro core, other metro, adjacent nonmetro, and nonadjacent nonmetro) (Butler and Beale 1994) and the percent of residents who commute to work outside the county. Stability was measured in two ways: by the mean number of years householders in a county have lived in their current place of residence, and by the percent of the population living in the same home as five years earlier.

The process features of community social capital focus on the student's level of social integration in the community.⁵ Five process measures are included in our model: the number of times a student had changed schools since first grade, the student's participation in religious activities, the number of community organizations in which the student has been involved, the number of leadership positions held, and how many parents of friends that their own parents tend to know.⁶ Children who experience frequent moves are at greater risk of dropping out of school, while those who participate in religious or nonreligious organizations are more inclined to stay in school (Coleman 1988; Israel, Beaulieu, and Hartless 2001; Teachman, Paasch, and Carver 1997). Furthermore, when other parents or local adults know these students, the adults can serve as a support system outside of the family or school that can guide and monitor youths' activities (Coleman 1988).

3.2 Analysis

To make inferences about U.S. public schools and their students, we employ hierarchical linear models (HLM) to examine students' 8th grade test scores and 8th-12th grade gain scores for math and reading. We also used the 8th grade IRT test score as a control variable in the gain score models (see Morgan and Sørensen 1999). Each model was specified to estimate parameters for two levels: student and school/community, with students nested within the school/community context. The models are also intended to clearly delineate the role of community proximity in the central place hierarchy (e.g., metro core, other metro, etc.) in shaping educational achievement. Community proximity serves as a *mediating* variable in our analysis, since family, school, and community attributes vary across geographic areas.

⁵ Measures of community-wide social networks were not available.

⁶ We assumed that participation in religious and non-religious groups involved youth in relationships with adults and peers. Information about the quality of these relationships was not available (Carbonaro 1999).

TABLE 1
Mean Math and Reading Test Scores for Students by County Type

	Metro Core (n=3,202)	Other Metro (n=3,449)	Adjacent Nonmetro (n=1,320)	Nonadjacent Nonmetro (n=1,228)
8th grade math/reading composite score	51.980	51.743	50.736	51.537
8th grade math IRT score	45.973	45.536	44.789	45.456
8th to 12th grade math IRT gain score	8.879	8.612	7.945	8.073
8th grade reading IRT score	46.753	46.922	46.243	46.761
8th to 12th grade reading IRT gain score	6.686	5.793	5.709	5.604

4. RESULTS

Test scores for 8th graders show few differences across the county types, though there was a downward trend from students living in metro core to those in nonadjacent non-metro counties for the composite score (Table 1). Differences emerged in the 8th to 12th grade gain scores, with metro core and metro other having larger math IRT gains and metro core having larger reading IRT gains.

Though the county typology differences in test outcomes are modest, those for student, school, and community attributes are large in many cases. A sampling of these variations can be seen in Tables 2 and 3. Table 2 presents mean scores on all student-level variables across the four county types, while Table 3 provides mean data for school/community based measures. Differences across the four geographic areas will be reviewed in greater depth in the discussion section of our study.

Table 4 reveals that a large number of variables were significant predictors of 8th grade math, reading, and the math/reading composite test scores. Of the student abilities and background variables, the two measures of ability (gifted status and grade point average) and taking Algebra 1 were especially important. Most measures of student engagement were significant. Hours spent doing homework and engagement in the classroom had a positive net effect on all three 8th grade test scores. The magnitude of these effects over the range of possible values is on par with taking Algebra 1. Interest in math and English classes was inconsistent, while readiness for class had a negative affect after controlling for other variables. Students who were rated by their teachers as being disruptive and those with poor attendance also scored lower on the tests. Finally, the disadvantages seen for females in math and for minorities in all tests remain after other variables are included.

The results are consistent with previous status attainment research that has shown that family resources affect educational achievement. For example, children whose mother or father attended college were more likely to have higher test scores. Likewise,

TABLE 2
Mean of Student-level Variables by County Type

	Metro Core (n=3,202)	Other Metro (n=3,449)	Adjacent Nonmetro (n=1,320)	Nonadjacent Nonmetro (n=1,228)
<i>Student Abilities and Background</i>				
Gender (% female)	52.000	51.700	54.300	51.200
Race (% white)	72.100	82.800	85.800	87.500
Student classified as gifted (%)	19.400	14.500	10.500	10.600
Average grades composite (A = 4.0)	2.987	2.969	3.041	3.008
Student had Algebra 1 in 8th grade (%)	40.300	36.800	35.500	28.600
Student regarded as disruptive in class (%)	13.400	12.600	9.500	9.600
Student skips, is tardy or absent (index max = 10)	1.568	1.388	1.322	1.155
Student's readiness for class (index max = 9)	6.285	6.329	6.464	6.591
Teacher's rating of student engagement (index max = 3)	2.348	2.358	2.515	2.473
Students' interest in class & future value (index max = 3)	1.896	1.868	1.940	1.899
Hours doing homework per subject per week	1.672	1.649	1.594	1.672
<i>Resources</i>				
At least 1 parent attended college (%)	76.100	72.800	64.000	67.500
Family income (group mean centered)	1.405	1.246	1.273	1.483
<i>Family Social Capital Structure</i>				
Number of siblings	2.201	2.175	2.179	2.275
Two-parent families (%)	78.900	81.200	82.000	81.300
<i>Family Social Capital Process</i>				
How often parents discuss school with child (index max = 2)	1.402	1.417	1.401	1.422
Amount of time spent alone after school (index max = 4)	1.837	1.864	1.803	1.785
How often parents check child's homework (often = 3)	2.104	2.073	1.985	2.071
How much parents limit TV time (often = 3)	1.154	1.112	1.024	1.034
How far parent expects child to go in school (complete graduate degree = 4)	2.826	2.675	2.619	2.570

TABLE 2 (Continued)

	Metro Core (n=3,202)	Other Metro (n=3,449)	Adjacent Nonmetro (n=1,320)	Nonadjacent Nonmetro (n=1,228)
<i>School Social Capital Process</i>				
Student talks to teacher outside class (index max = 5)	2.329	2.261	2.521	2.213
Teacher is nurturing to student (index max = 3.3)	2.132	2.096	2.156	2.138
No. of school orgs. involved in	2.905	2.909	3.408	3.151
Average amount that parents contact school (4+ times = 3)	.405	.392	.350	.350
Parent involved with other school organizations (%)	24.700	26.000	28.100	28.400
Amount of parent's volunteering in PTO (index max = 4)	1.128	.965	.867	.817
<i>Community Social Capital Process</i>				
Student belongs to religious group (%)	32.900	34.900	40.800	41.700
Number of nonreligious groups student involved in	1.289	1.317	1.387	1.295
Number of leadership positions held in community	.738	.736	.764	.768
Number of times changed school since grade 1	1.358	1.322	.992	.958
Parent knows name of child's friends parents (max = 5)	2.541	2.757	3.017	3.178

TABLE 3
Mean of Schools' Characteristics by County Type

	Metro Core (n=256)	Other Metro (n=252)	Adjacent Nonmetro (n=93)	Nonadjacent Nonmetro (n=86)
<i>Resources</i>				
Per pupil expenditures	\$3,545	\$2,998	\$2,730	\$2,628
Socio-economic capacity (index centered on 0)	0.279	0.030	-0.482	-0.704
<i>School Social Capital Structure</i>				
School enrollment	881	737	566	504
Percent minority students in school	40.9	21.6	20.6	16.2
Percent free lunch in school	29.8	23.5	27.7	32.9
Emphasis on academics (aggregate of parents' perceptions for 4 items, index range 0 to 3)	2.036	2.000	1.964	1.996
Average attendance rate (%)	92.7	93.7	94.3	94.1
<i>Community Social Capital Structure</i>				
Percent of employed who work outside county	23.7	22.4	29.3	16.7
Percent of people in same county in 1985	79.6	79.3	81.5	83.0
Average years of living in the home	10.1	10.8	12.0	11.8
Percent of registered voting in 1988	72.6	71.3	68.4	67.7
Average population in 1990	761,379	104,899	24,713	19,861

TABLE 4
Regression Coefficients Showing the Effect of Social Capital on 8th Grade Test Scores

Explanatory Variable	Composite for <u>math/reading</u>		<u>Math IRT score</u>		<u>Reading IRT score</u>	
	Estimate	P-value	Estimate	P-value	Estimate	P-value
Intercept	24.639		18.788		29.871	
<i>Student Abilities and Background</i>						
Gender: female (vs. male)	-.666	.000	-1.708	.000	.754	.000
Race-ethnicity: Hispanic	-2.128	.000	-1.805	.000	-1.632	.000
black	-3.712	.000	-3.329	.000	-2.651	.000
white	.000	--	.000	--	.000	--
Student classified as gifted	5.966	.000	4.360	.000	4.522	.000
Average grades composite	2.210	.000	1.670	.000	1.694	.000
Student had Algebra 1	3.515	.000	3.652	.000	1.685	.000
Student regarded as disruptive	-.943	.000	-.739	.001	-.784	.001
Student skips, is tardy or absent	-.217	.000	-.198	.000	-.157	.001
Student's readiness for class	-.094	.025	-.092	.011	-.014	.731
Student engagement in class	.638	.000	.679	.000	.422	.000
Interest in class & future value	-.015	.924	.466	.001	-.440	.003
Hours doing homework	.606	.000	.521	.000	.443	.000
<i>Resources</i>						
At least 1 parent attended college	.798	.000	.554	.000	.754	.000
Family income	.014	.000	.011	.000	.009	.001
Per pupil expenditures	.00006	.651	.00006	.582	.00000	.996
Socio-economic capacity	.580	.002	.605	.000	.307	.067
<i>Family Social Capital Structure</i>						
Family structure: 1 parent	.959	.039	1.294	.001	.225	.612
2 parents	.390	.377	.896	.019	-.216	.608
other	.000	--	.000	--	.000	--
Number of siblings	-.225	.000	-.109	.011	-.249	.000

TABLE 4 (Continued)

Explanatory Variable	Composite for <u>math/reading</u>		<u>Math IRT score</u>		<u>Reading IRT score</u>	
	Estimate	P-value	Estimate	P-value	Estimate	P-value
<i>Family Social Capital Process</i>						
How often parents/child discuss	2.000	.000	1.334	.000	1.917	.000
Amount of time spent alone	-.198	.001	-.159	.000	-.146	.014
How often parents check homework	-.681	.000	-.543	.000	-.513	.000
How much parents limit tv time	.391	.000	.285	.000	.322	.000
How far parent expects child to go	1.649	.000	1.316	.000	1.309	.000
<i>School Social Capital Structure</i>						
Emphasis on academics	2.224	.000	3.128	.000	.440	.422
Minority percent of enrolled	-.019	.000	-.017	.000	-.013	.006
Percent in free & reduced lunch	-.026	.000	-.024	.000	-.015	.015
School enrollment	.00006	.848	.00006	.833	.00000	.977
Average student attendance rate	.118	.000	.117	.000	.076	.008
<i>School Social Capital Process</i>						
Talks to teacher outside class	-.371	.000	-.260	.000	-.329	.000
Teacher is nurturing to student	-.296	.032	-.428	.000	-.135	.306
No. of school orgs. involved in	-.112	.000	-.072	.008	-.138	.000
Amount that parents contact school	-.667	.001	-.613	.000	-.485	.012
Parent involved with other school organizations	.326	.075	.318	.045	.157	.371
Amt. parent's volunteer for PTO	-.152	.026	-.173	.004	-.062	.344
<i>Community Social Capital Structure</i>						
Residential stability	-.067	.001	-.048	.008	-.054	.002
Residential longevity	.238	.002	.158	.021	.208	.002
Percent commuting: metro core	-.026	.000	-.024	.000	-.017	.011
other metro	-.031	.001	-.032	.000	-.015	.022
adj. nonmetro	-.032	.005	.028	.002	-.020	.047
nonadjacent	-.004	.830	.002	.907	-.008	.615
Voter participation	.023	.047	.017	.102	.017	.091

TABLE 4 (Continued)

Explanatory Variable	Composite for <u>math/reading</u>		<u>Math IRT score</u>		<u>Reading IRT score</u>	
	Estimate	P-value	Estimate	P-value	Estimate	P-value
<i>Community Social Capital Process</i>						
Student belongs to religious group	1.305	.000	.724	.000	1.222	.000
Number of nonreligious groups student involved in	-.507	.000	-.347	.000	-.416	.000
Number of leadership positions	.822	.000	.592	.003	.766	.000
No. of times changed school	-.012	.000	-.027	.526	.010	.839
Parent knows child's friends parents	-.063	.805	-.027	.531	-.062	.190

test scores tended to be higher among children from families with higher incomes, though this was modest in comparison to family social capital variables. School resources, as measured by per student expenditures, had little effect on test scores. Community resources (i.e., socioeconomic capacity), however, showed a modest and positive net influence on test scores.

In keeping with earlier research on the structural aspect of family social capital (Beaulieu and Israel 1997; Israel, Beaulieu, and Hartless 2001; Smith, Beaulieu, and Seraphine 1995), family structure had some influence on test scores. The presence of one parent in the household was associated with higher test scores on two of the three measures. In addition, students with one or more siblings were less likely to do well on the 8th grade tests.

Family social capital appears important in shaping a child's academic performance. We found that students were more likely to have higher test scores if a parent expressed expectations for obtaining a college degree (as compared to a high school diploma or not completing high school), if they discussed school programs with their parents, if parents placed limits on the amount of time that the child was allowed to watch television, if parents did not have to check homework frequently, and their 8th grader spent little or no time alone after school.

The role of school structure in helping young people perform well on tests is significant for a number of measures. The number of students enrolled in the school was not a significant factor, but the percentage of minority students and those in the free lunch program had a significant negative effect. Schools having an emphasis on academic achievement increased students' test scores, though this effect was much smaller for reading. Higher attendance rates also were associated with higher test scores for students at those schools.

Regarding the social capital process variables, the frequency of teacher-student conversations outside the classroom negatively affected test scores. This might mean that after accounting for ability and engagement, students who need to talk with teachers outside of class do so to address an academic or behavioral problem. Surprisingly, having teachers who are more nurturing and the degree of involvement in student organizations had a negative effect on test scores, but the impact was small.

Several other school social capital variables were significant. Students whose parents were involved in a PTO scored lower on the tests, but those with parents involved in other school organizations did better on the tests (though marginally significant). This might reflect a more ritualistic involvement in PTOs, as compared to the intensive involvement of parents in sports or band booster organizations. It is likely that this type of parental involvement fosters student-parent and teacher-parent relationships and helps the student stay engaged in school. On the other hand, in cases where the parent contacted the school, these interactions had a negative effect on test scores, likely reflecting instances where parental contacts were precipitated by disciplinary or academic problems.

Results for community structure in Table 4 show modest effects on test scores. Average years in the current home had a positive effect on test scores. Communities having higher residential stability and a lower percentage of commuters also showed a positive association with test scores.⁷ The county type, which indicates community proximity in the central place hierarchy, moderates the effect of other community and school attributes and, more importantly, remains a significant factor in our models.

Three process measures of community social capital were influential on test scores. Involving youth in a religious group had a positive effect, but participating in other youth organizations lowered test scores. Taking on a leadership role in these organizations had a positive effect, which suggests that a more in-depth mentor-protégé relationship is necessary for the student to benefit. The number of times a student has changed schools and parents knowing other parents were not important, in most cases, after the effects of other variables were taken into account.

Overall, the results in Table 4 suggest that many social capital variables, as well as those measuring student activities and ability, have significant effects on 8th grade test scores. The results also suggest that these are additive in the same way that the Search Institute's asset model (Scales and Roehlkepartain 2003) posits that the more positive factors (or assets) that a student has, the more resilient and successful the student will be. Similar but less dramatic results are shown for estimated gain scores in Table 5. Of the notable differences, gender had nearly as large an effect on gains scores as for the base year, and having a parent attend college also maintained its effect. On the other hand, behaviors inhibiting (being disruptive, tardy, or absent) or facilitating learning (hours doing homework) had less impact on gains. This might reflect the fact that many low performing students drop out of school between the 8th and 12th grades.

As the results in Tables 4 and 5 suggest, the variables included in our analysis form a powerful set of predictors for student's scores on 8th grade standardized tests and on subsequent gains when viewed collectively. The R-squares for 8th grade math and reading IRT test scores range from .321 to .537 (Table 6). Review of the reduction in unexplained variance for the two models shows that student ability and background variables have large impacts, followed by family social capital structure and process variables. Resources, mostly at the family level, had nearly the impact of family social capital.

School and community social capital variables reduced unexplained variance by a modest amount, and these were larger for students living in nonmetro counties (both adjacent and nonadjacent). It also appears that the contextual effect of school and community is interrelated with student variables, so that the school/community variance was reduced as student-level variables were added to the model. The R-squares for math and reading gain scores (between 8th and 12th grades) were modest and ranged from .058 to .170 (Table 7). The pattern of effects shown in Table 6 (e.g., student abilities and

⁷ Commuting in nonadjacent nonmetro communities is not significant because there is less commuting (also, less variation) among these counties.

background having the largest reduction in unexplained variance, followed by family social capital) was also seen for math and reading gain score variances shown in Table 7.

TABLE 5

Regression Coefficients Showing the Effect of Social Capital on Gain Scores

Explanatory Variable	8 th - 12 th Math Gain		8 th - 12 th Reading Gain	
	Estimate	P-value	Estimate	P-value
Intercept	9.229		11.109	
<i>Base-year control</i>				
8 th Grade test score	-.207	.000	-.270	.000
<i>Student Abilities and Background</i>				
Gender: female (vs. male)	-1.326	.000	.623	.001
Race-ethnicity: Hispanic	-.790	.001	-1.011	.018
black	-1.055	.000	-2.145	.000
white	.000	--	.000	--
Student classified as gifted	1.161	.000	1.421	.000
Average grades composite	1.092	.000	.873	.000
Student had Algebra 1	.710	.000	1.105	.000
Student regarded as disruptive	-.054	.834	-.042	.902
Student skips, is tardy or absent	-.121	.021	.002	.976
Student's readiness for class	.004	.930	-.073	.178
Student engagement in class	.366	.000	.255	.029
Interest in class & future value	.574	.000	-.115	.561
Hours doing homework	.022	.755	.132	.145
<i>Resources</i>				
At least 1 parent attended college	.570	.001	.358	.115
Family income	.006	.032	-.003	.367
Per pupil expenditures	.0002	.081	.0001	.373
Socio-economic capacity	.415	.015	-.030	.888
<i>Family Social Capital Structure</i>				
Family structure: 1 parent	.125	.803	2.070	.002
2 parents	.151	.752	2.060	.001
other	.000	--	.000	--
Number of siblings	-.061	.208	-.133	.037
<i>Family Social Capital Process</i>				
How often parents/child discuss	.111	.515	.135	.545
Amount of time spent alone	-.141	.020	-.026	.747
How often parents check homework	-.238	.001	-.227	.019
How much parents limit tv time	.147	.036	.264	.004
How far parent expects child to go	.794	.000	1.016	.000

TABLE 5 (Continued)

Explanatory Variable	8 th - 12 th <u>Math Gain</u>		8 th - 12 th <u>Reading Gain</u>	
	Estimate	P-value	Estimate	P-value
<i>School Social Capital Structure</i>				
Emphasis on academics	1.285	.021	.780	.269
Minority percent of enrolled	-.001	.802	-.008	.235
Percent in free & reduced lunch	-.006	.324	-.005	.511
School enrollment	.0002	.420	-.0002	.500
Average student attendance rate	.011	.709	.005	.894
<i>School Social Capital Process</i>				
Talks to teacher outside class	-.181	.000	-.118	.071
Teacher is nurturing to student	-.097	.473	.009	.959
No. of school orgs. involved in	-.104	.001	-.088	.036
Amount that parents contact school	-.312	.122	-.407	.122
Parent involved with other school organizations	-.139	.410	.108	.623
Amt. parent's volunteer for PTO	.120	.064	-.002	.984
<i>Community Social Capital Structure</i>				
Residential stability	-.036	.038	-.034	.121
Residential longevity	.127	.050	-.081	.327
Percent commuting: metro core	-.014	.038	-.005	.560
other metro	-.015	.027	-.018	.035
adj. Nonmetro	-.022	.028	-.008	.507
nonadjacent	-.019	.217	-.003	.871
Voter participation	.002	.847	.029	.023
<i>Community Social Capital Process</i>				
Student belongs to religious grp.	.275	.094	.429	.046
Number of nonreligious groups student involved in	-.066	.422	-.185	.087
Number of leadership positions	.321	.142	.161	.574
No. of times changed school	-.024	.647	.217	.002
Parent knows child's friends parents	.020	.683	-.144	.021

TABLE 6

Summary Model Statistics for Hierarchical Linear Models of the Effect of Social Capital on 8th Grade Test Scores

	<u>Metro Core</u>		<u>Other Metro</u>		<u>Adjacent Nonmetro</u>		<u>Non-adj. Nonmetro</u>		
	Student variance	School & community variance	Student variance	School & community variance	Student variance	School & community variance	Student variance	School & community variance	-2 log- likelihood
Math IRT									
Intercept only	59.071	17.283	62.680	9.655	54.623	9.415	55.787	10.987	65,114
Student ability & background									
	36.248	6.480	37.282	6.130	36.546	7.272	37.433	7.367	60,696
Resources	36.160	3.677	36.576	4.521	36.254	5.843	36.675	7.237	60,467
Family social capital	34.357	2.917	34.828	3.735	35.616	5.124	34.911	6.577	60,013
School social capital	33.864	1.814	34.366	3.340	35.257	4.108	34.644	4.446	59,844
Community social capital	33.668	1.704	34.129	2.881	35.289	4.250	34.441	4.005	59,821
R ²		.537		.488		.382		.424	
Reading IRT									
Intercept only	58.422	11.453	68.549	5.513	59.926	7.018	66.075	6.315	65,519
Student ability & background									
	44.016	3.549	48.139	3.227	44.573	4.991	46.380	5.455	62,441
Resources	43.652	2.479	47.469	2.298	44.055	4.005	45.294	5.027	62,260
Family social capital	41.473	1.931	45.265	1.800	42.828	3.399	43.030	4.473	61,799
School social capital	40.711	1.327	45.144	1.609	42.964	2.897	42.344	3.392	61,703
Community social capital	40.530	1.220	44.574	1.459	42.325	3.117	41.878	2.822	61,701
R ²		.403		.378		.321		.383	

TABLE 7

Summary Model Statistics for Hierarchical Linear Models of the Effect of Social Capital for Gains on Test Scores

	<u>Metro Core</u>		<u>Other Metro</u>		<u>Adjacent Nonmetro</u>		<u>Non-adj. Nonmetro</u>		
	Student	School &	Student	School &	Student	School &	Student	School &	-2 log-
Math Gain	variance	community	variance	community	variance	community	variance	community	likelihood
Intercept only	26.544	1.300	29.136	1.993	30.876	5.084	31.336	2.338	35,467
8 th grade test score	26.427	1.411	29.089	2.029	30.777	5.098	31.485	2.251	35,469
Student ability & background	24.795	1.446	26.679	2.055	28.036	4.914	29.342	1.995	35,061
Resources	24.573	1.070	26.423	1.546	27.600	3.839	29.659	1.564	34,987
Family social capital	24.320	1.077	26.144	1.461	26.942	3.531	28.708	1.589	34,905
School social capital	24.181	0.892	26.104	1.362	26.666	3.423	28.735	1.901	34,917
Community social capital	24.171	0.962	26.072	1.406	26.581	3.250	28.666	1.853	34,964
R ²	.097		.117		.170		.094		
Reading Gain									
Intercept only	45.888	2.459	52.546	2.581	48.190	4.550	43.897	3.536	38,295
8 th grade test score	45.125	2.692	51.331	2.840	47.460	4.696	43.267	3.419	38,213
Student ability & background	43.044	1.955	48.382	2.974	45.721	4.502	42.837	3.116	37,963
Resources	42.854	1.647	48.319	2.601	45.851	3.792	43.092	2.746	37,955
Family social capital	42.406	1.799	47.636	2.208	44.839	3.534	42.358	2.825	37,874
School social capital	42.374	1.828	47.349	2.344	44.968	3.261	42.194	3.022	37,955
Community social capital	41.935	1.688	47.476	2.167	44.853	2.730	41.954	2.744	37,912
R ²	.098		.099		.098		.058		

5. CONCLUSIONS AND DISCUSSION

In this study, we examined a comprehensive set of factors that might be incorporated into community efforts aimed at creating a pool of high-quality workers. We did so by articulating how the strength of social capital present in the family and school, and in the community in which these institutions are embedded, might lead to improvements in student achievement. We argued that achievement on standardized tests is an early marker of the future human capital resources available to support local economic growth.

We explored the influence of social capital on 8th grade test scores and gains from the 8th to 12th grades for math and reading. Examining educational outcomes in terms of students' activities, participation and behavior, course selection, and ability proved fruitful. Most of these variables helped to explain the variance in test scores and gains. In the end, our findings reaffirmed the significant role of parents in giving shape to the educational progress of their children. Family resources also played an important role in promoting academic success. In addition, a number of measures of social capital in the school and community had a significant effect on test scores and gains. Finally, the contextual aspects of school and community structure mediated the influence of family social capital, student ability, and background on student achievement.

The results support the view that youths' academic success stands on a three-legged stool — families, schools, and communities. Because efforts to raise student achievement focus almost exclusively on the school, new approaches for improving student performance remain school-centered in their orientations. Our results show that enhancing family capacity should be viewed as a critical ingredient in promoting the educational achievement of students. As such, a conscientious effort must be made to design and deliver an array of programs that could help build parent competencies and facilitate the creation of social capital in the home. Included could be tools to promote high-quality parent-child interactions, building children's self-confidence, and raising their educational aspirations. Also included in the toolkit for parents could be activities that can help curb behaviors by their children that might inhibit their academic progress. When taken together, these types of strategies help establish a home environment where parent-child relationships are strong, and where parents express a high regard for education.

Although community social capital may be less significant in influencing a student's academic achievement, one should not disregard community social capital as a potential resource. Community social capital likely influences high school students' educational performance through the variety of programs, organizations, and activities available in a locality. Community leaders might work with teachers to develop service-learning projects of interest to parents, students, and teachers that foster relationships outside of the classroom. Community service learning projects, such as community visioning or asset mapping, youth entrepreneurship, and delivery of services to elders or peers, can teach youth how to engage in civic affairs, enhance integration of new students, and help address local needs. Through their participation, citizens convey the importance of high

educational performance to children and help students to develop the skills necessary to succeed.

Localities differ in their ability to enhance community social capital. Inequality, isolation, dependency, and gaps in the organizational and institutional structure can inhibit action on the part of communities and schools. We found that students attending schools in rural (nonadjacent nonmetropolitan) areas face a set of structural conditions that work against academic success. Until these structural deficiencies are confronted, many communities will be unable to muster the social capital needed to make a real difference in the life chances of local youth.

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