

The Influence of Social Capital on Test Scores: How Much Do Families, Schools & Communities Matter?*

Glenn D. Israel
University of Florida

Lionel J. Beaulieu
Southern Rural Development Center

*This research is part of Florida Agricultural Experiment Station Project FLA-AEC-03957. Direct correspondence to Glenn Israel, Program Development and Evaluation Center, University of Florida, PO Box 110540, Gainesville, FL 32611-0540 or email the author at gdi@mail.ifas.ufl.edu.

Abstract

Promoting the academic success of America's youth has been debated intensely within national and state policy arenas. Evidence has accumulated which shows that families and communities must be engaged in helping youth to be successful in school. In this paper, we employ the notion of social capital as a framework for understanding the performance of public school students. Our earlier research using the *National Education Longitudinal Survey* (NELS) data showed that family social capital is an important influence on achievement and that community social capital, though less powerful, also plays a role in helping youth excel. Our focus turns to exploring the extent to which social capital in schools facilitates learning. Specifically, this research explores the contributions of school social capital, as well as that in the family and community, in helping young people to perform well on standardized tests. We use hierarchical linear models to estimate these effects and the data show that measures from each category of social capital affect test scores, with family social capital making the most difference.

Introduction

Increasing evidence indicates that our nation's economic well-being in the global economy is linked directly to our capacity to develop a labor force with the knowledge and skills necessary to operate in an increasingly complex and dynamic work environment (Judy and D'Amico 1997; Katz 1992:30-35). Recognizing the crucial role of education, Judy and D'Amico (1997:8-9) stated that the improvement of public education must be the goal of workforce development. Though the notion that public schools need to be improved is widely accepted, the issue of how to make these improvements is subject to considerable debate. Some argue that public investments in families and communities are as important as those for schools (Lerner 1995; Little 1993). Schorr (1988) asserts, for example, that the most meaningful efforts are based on the view that children are part of families, and families are part of communities. Therefore the entire community must build a support system devoted to working with families in helping children realize their full potential.

In this paper we consider the role of social capital—the set of supportive interpersonal interactions that exists in the family, community, and school—in promoting educational

achievement. Though the notion of social capital needs refinement and is applied in a variety of ways (Wall, Ferrazzi, and Schryer 1998), it focuses on the process and structure of relationships that can facilitate or inhibit action and access to resources (Coleman 1988a; Putnam 1993). Employing data on public school students from the National Education Longitudinal Survey (NELS), we examine the link between students' access to social capital and an important educational benchmark, standardized test scores.

Below we review the structural and process attributes of families and communities that indicate the presence and strength of social capital. Although we build on past work (Beaulieu, Israel, Hartless, and Dyk 2001; Coleman 1988a, 1988b; Israel, Beaulieu, and Hartless, 2001; Smith, Beaulieu, and Israel 1992; Smith, Beaulieu, and Seraphine 1995; Sun 1999), we then develop the conceptualization and measurement of school social capital, and explore its influence, as well as that of the family and community, on students' performance on standardized test scores.

An Overview of Family Social Capital

The term *family social capital* represents the norms, social networks, and relationships between adults and children that are valuable for children while they are growing up (Coleman 1990:334). Thus an important feature of social capital is that it is invested in relationships which emerge through interpersonal interaction. Smith et al. (1995) elaborate on Coleman's notion of social capital by suggesting that its attributes include both structure and process, which condition the environment for educational achievement in a complementary fashion. Structure determines the opportunity for interpersonal interactions, as well as for their frequency and duration. Process, on the other hand, represents the quality of parents' involvement in their children's lives. Process not only incorporates parents' nurturing activities but also includes efforts intended to constrain inappropriate behaviors by their children.

Several structural characteristics in the family can influence the extent of social capital, including the presence of one or both parents in the home and the number of siblings (Beaulieu et al., 2001; Israel et al., 2001; Smith et al., 1995). These components help to determine the opportunity for interpersonal interactions between parents and children, and give shape to the frequency and duration of such interactions (Smith et al. 1995). The process elements of family social capital include parents' nurturing activities, such as helping children with their homework, discussing important school activities with them, and holding high educational aspirations for them. It also embraces constraint of activities, such as limiting television viewing, providing adult supervision when the children return from school, and monitoring homework.

A large number of studies have documented the influence of family social capital on educational achievement. Furthermore, this influence may be moderated by geography because, for example, rural families are more likely than urban families to have "traditional" family arrangements, in which both mother and father are present. Rural families also tend to be larger because of their higher fertility rates (Fuguitt, Brown, and Beale 1989). In addition, a disproportionate share of U.S. families with limited education or with incomes below the poverty line live in rural places (Hobbs 1991; Lichter and Eggebeen 1992; Lichter, Beaulieu, et al. 1993; O'Hare 1988). Taken together, these structural traits shape the quality and quantity of interaction between children and their parents, as well as the children's academic achievement and educational aspirations (Haller and Portes 1973; Kandel and Lesser 1969; Lichter, Cornwell, and Eggebeen 1993; Smith et al. 1995).

An Overview of Community Social Capital

Community field theory (Wilkinson 1991) provides an important framework for understanding the role of social capital in educational achievement. From this perspective, community social capital develops from residents' action to improve the local economy, provide human and social services, and express local cohesion and solidarity. According to Robert Putnam (1993), localities with high community social capital are marked by extensive civic engagement and patterns of mutual support (or norms of reciprocity). Though there is much interaction in most locales, community occurs when local actors link groups and coordinate activities that serve the public at large rather than the interests of private groups (Wilkinson 1991).^{i[i]} A pattern of community activeness builds social capital in that the networks developed during past activities provide a foundation for new community efforts to address educational or other needs (Lloyd and Wilkinson 1985; Luloff and Wilkinson 1979; Putnam 1993; Zekeri, Wilkinson, and Humphrey 1994). Similarly, relationships developed in the ongoing activities of community-oriented groups, as well as a social psychological investment in the community, are resources that facilitate residents' mobilization to address issues of common interest and concern. One way in which community social capital accumulates is through the activities of generalized leaders (Israel and Beaulieu 1990; Wilkinson 1974, 1991), whereby local interests are coordinated through overlapping, multiple relationships.

Structural Attributes of Community Social Capital

Structural attributes that can influence the accumulation of community social capital include socioeconomic capacity, isolation, instability, and inequality (Israel et al., 2001; Wilkinson 1991). These features shape opportunities for emergence of the community field, as well as for interaction between youths and adults at the local level. Localities large enough to support the variety of associations for meeting most daily needs have a capacity to develop extensive community social capital. A larger community generally has greater access to outside resources and greater structural differentiation for dealing with an array of community issues (Luloff and Wilkinson 1979). Structural differentiation increases adaptive capacity because people with the expertise and experience needed to address a particular issue, including the generation of human capital, are available in the organizational structure of the community. In short, structural differentiation can facilitate the accumulation of community social capital.

In recent decades, the socioeconomic capacity of rural areas has lagged behind that of suburban and urban areas. As a result, 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). The local labor market profile is critical because the availability of well-paying jobs is likely to increase individuals' interest in pursuing formal education and making other human capital investments (Stallmann et al. 1995). Low-capacity rural communities, where educational attainment, income levels, and job-related skills are lower, can develop a milieu that does not support educational success. This can create resistance to educational investments, which in turn may reduce rural students' educational achievement and aspirations relative to those of urban and suburban students (Cobb, McIntyre, and Pratt 1989; Sewell 1964; Smith et al. 1995).^{ii[iii]}

Other attributes, such as isolation, instability, and inequality, affect the development of community social capital by enhancing or inhibiting opportunities for relationships that contribute to structural integration. Structural integration provides normative channels in a local society, through which specialized resources may be mobilized (Luloff and Wilkinson 1979).

The degree to which local activity is actually coordinated by integrative structures, such as local government or informal community networks, can vary greatly across communities. Physical isolation, both spatial and temporal, decreases the interaction necessary for building community bonds among residents (Wilkinson 1991). Residents of the sparsely populated countryside incur added cost in maintaining social networks, especially the “weak ties” consisting of the more transitory and less intimate interactions that underpin much of community interaction (Granovetter 1973; Wilkinson 1991). Residents who are employed outside the locality also can become isolated because they have less time for maintaining local relationships (Elder 1996). Though spending time outside the community does not, in itself, mean that residents are not involved in locally oriented activities, it may reduce the importance of local activities, including supporting the education of local youths.

Residential instability also can disrupt local relationships, thereby reducing the social capital available to community members. As observed by Coleman (1988a), individuals may benefit by moving, but those who remain behind suffer disruption of relationships that are important to specific outcomes, such as educational attainment. Localities experiencing extensive turnover or containing many short-term residents have fewer opportunities to develop relationships that help to coordinate community activities and build social capital.

Inequality creates social cleavages that affect the quality of interaction (Blau 1994). Insofar as certain sociodemographic groups, such as racial or ethnic minorities in American society, have more or less access to a locality’s various resources, inegalitarian processes can create durable, overlapping cleavages between powerful elites and weak, unorganized commoners in community affairs. The have-nots can become disenfranchised and alienated (Gaventa 1980; Luloff and Swanson 1995). When many residents are alienated from local activities, participation in community affairs declines and collective action is fragmented at best. Fragmented, incomplete networks of relationships inhibit structural integration. One result of high inequality is what Luloff and Swanson (1995) call the disaffected community, in which little social capital is available for promoting local educational issues.

Process Attributes of Community Social Capital

The process components of community social capital can be described at two levels: first, by the extent and character of community action, and second, by individual relationships among adults and youths. The first of these components is characterized by large numbers of actions and actors, inclusiveness of interests represented, and widespread involvement in decision making and implementation. Typical actions conducive to educational achievement include campaigns urging voters to pass initiatives that improve facilities such as schools, sports arenas, and community centers, or to create programs for use by youths and activities that involve students in community development projects (Israel, Coleman, and Ilvento 1993).

Individual relationships are demonstrated by adult residents’ interest in the welfare of other people’s children and by the efforts of individuals and organizations to engage children in local programs and activities that make effective use of their time and energy (Beaulieu and Israel 1997; Coleman and Hoffer 1987; Smith et al. 1995). Adult-youth relationships, which may develop through church- and community-based groups, offer an opportunity to shape youths’ norms, values, and aspirations. When these activities involve more highly educated adults, youths are surrounded by positive role models that illustrate the importance of educational achievement. The most distinctive property of community social capital is that adults’ involvement creates a “caring community” (Lerner 1995), where a social support system is in

place for local youths and where adults seek to maximize youths' development.

School Social Capital and Educational Achievement

Structural Attributes of School Social Capital

Neisser (1986) has suggested that achievement among school-aged children in America stems largely from variability in the nature of the schools to which they go. One aspect of that variability is the *structural* features of schools, their so-called contextual settings. These elements can influence the educational achievement of students in that they affect the quality of the interactions taking place within the school setting and as such, facilitate or impede the emergence of school social capital. These structural components include the socioeconomic and demographic composition of the student body, the size and resource base of the school, qualifications of teachers and staff, and the nature of the climate evident in the school or classroom -- such as the value placed on learning, norms for student behavior, and the existence of an orderly learning environment (Stockard and Mayberry 1992).

For example, schools whose students are drawn from high socioeconomic status families, and who interact with high-status peers, are more likely to realize higher achievement (Coleman et al. 1966). Many explanations have been offered for this outcome. For one, students attending higher SES schools are more likely to establish friendships with individuals having solid academic habits and high educational aspirations (Stockard and Mayberry 1992) and to interact more with positive adult role models (Kupersmidt, Griesler, DeRosier, Patterson & Davis, 1995). Second, higher status schools are likely to have well established norms and values that place a premium on good academic performance (Alexander and Eckland 1975). Third, higher SES schools are likely to be found in communities that place a priority on quality education and as such, are likely to provide greater support to schools (Friedkin and Neocochea 1988).

Closely related to the socioeconomic context of the school is race, ethnicity and family structure. Racial composition of schools is an important one in that schools consisting of largely white students are more likely to be drawn from middle-class backgrounds, while those comprised of more racial and ethnic minorities have a greater tendency to come from lower status backgrounds (Stockard and Mayberry 1992). Likewise, a concentration of students from single-parent families has been associated with lower levels of educational achievement (Caldas and Bankston, 1999; Sun, 1999).

The structural feature of schools that has commanded considerable attention has been school size. Conant's classic study, published in the late 1950s, proved instrumental in asserting that larger schools were more effective since they could provide a more varied and richer educational program for their students (McDill and Rigsby 1973). Others, on the other hand, have suggested that Conant was wrong in that he failed to acknowledge the positive features associated with smaller schools, such as lower student-teacher ratios, and closer attention by teachers to the needs of their students (Gregory and Smith 1987). Hobbs (1995:268) noted that while smaller schools have traditionally been perceived as being academically deficient, there is little evidence that small schools inhibit academic performance. Several studies (Greenwald, Hedges, and Laine, 1996; Lee and Smith, 1996; Sher 1988; Walberg and Fowler 1987) contend that student performance tends to favor smaller rather than larger schools. Increased school size has been linked to greater absenteeism, lower academic performance, lower participation in school activities, and lower completion (Barker & Gump, 1964; Lambert, n.d.; Lindsay, 1982; Rossi & Daugherty, 1996; Sher, 1988; Walberg & Fowler, 1987; see Anderman and Kimweli

1997 for contrary findings). There also is some evidence that small class sizes (approximately 18 students) have higher achievement and fewer discipline problems (Anderman & Kimweli, 1997; Bryk et al., 1993; Flinn, 1998). A small class size also allows teachers to get students' attention and to keep them engaged in learning (Stockard & Mayberry, 1992).

Another structural component, the level of financial resources provided to the school, can affect the learning environment and, hence, educational achievement in the school (Greenwald et al., 1996; Mortimore et al. 1988; Wenglinsky, 1997). Higher per student expenditures can translate into better facilities, a wider variety of programs and activities available to students, and more qualified faculty, thereby improving educational achievement. Anderman and Kimweli (1997) also reported that schools with lower salaries and high teacher disinterest had more students with discipline problems. Though some studies have found no relationship between expenditures and achievement, those that have usually did so when increased resources are applied via targeted programs (Arum, 1996; Stockard & Mayberry, 1992). Ascher (1994) suggests that schools located in impoverished communities tend to be resource poor and are likely to have run-down and crowded facilities, obsolete laboratories and computers, and poorly paid teachers which, in turn, can increase students' alienation and lower academic performance.

There is a large body of literature investigating the relationship between staff characteristics and school effectiveness. These include teacher education (advanced degrees and credentialing), experience, staffing ratios, and turnover. There has been, however, conflicting findings about the relationship between student achievement and teachers' education (Bridge, Judd & Moock, 1979; Greenwald et al., 1996; Murnane & Phillips, 1981; Stockard & Mayberry, 1992). High staff turnover has shown the strongest association with lowered academic achievement (Stockard & Mayberry, 1992). It is also reasonable to expect that high turnover is associated with schools troubled by discipline problems, an uninspired school climate, and weak leadership.

A school's organizational structure and the conduct of educational processes also can affect student achievement (Lee and Smith, 1996). Extensive cooperation among teachers and shared decision-making with teachers and administrators can provide an increased capacity to solve problems, integrate staff efforts to achieve common goals, and maintain teacher morale. Students who find themselves embedded in an environment where teachers' expectations for, efficacy in, and support of high academic performance tend to perform better academically (Hoffer, Greeley & Coleman, 1987; Lee and Smith, 1996; Rutter, Maughan, Mortimore & Ouston, 1979). Furthermore, the presence of orderly environments in the school and the classroom suggests that students excel in a milieu where norms of behavior are well articulated and where problem behaviors on the part of students are kept low (Anderman & Kimweli, 1997; Bryk, Lee & Holland, 1993; Parcel and Dufur, 2001; Rutter et al. 1979). Lower high school achievement scores and increased adolescent drug use are associated with higher dropout rates (Battin-Pearson, Newcomb, Abbott et al., 2000; Garnier, Stein & Jacobs, 1997). Dropping out of school is a likely consequence for students with numerous behavioral incidents and disciplinary actions. Incidents, along with suspensions and expulsions, indicate situations where a student's needs may not be met and academic performance is poor, resulting in frustration and behavioral outbursts. In such cases, opportunities outside of school may appear more attractive than those inside the school and lead to dropping out (Wehlage & Rutter, 1986).

Process Attributes of School Social Capital

The process components of school social capital can be described at two levels, as is the

case for community social capital (Israel et al. 2001). First, a school's social networks are characterized by large numbers of activities and involvement by students, teachers, and other adults, inclusiveness of interests represented, and widespread involvement in decision making and implementation. Second, at the individual level, relationships among teachers and youths are demonstrated by teachers' interest in the welfare of students and by the efforts to engage students in school programs and activities that make effective use of their time and energy. School organizations' activities serve to immerse students in an environment where positive social relationships with adults and peers can occur, and where important life skills are taught (Lerner 1995). Related to the student's involvement in interpersonal relations with teachers and peers is the level of parental investment in the activities of the school. Evidence does suggest that strong partnerships between parents and schools result in better academic outcomes for students (Eccles and Harold 1993).

Based on the above discussion, we explore whether supportive interpersonal interactions existing in the school, as well as that in the family and community, have a positive effect on staying in school.

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. A sample of grade 8 pupils was selected from each of these schools and surveyed, 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.

Additional 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.^{iii[iiii]} We merged 1990 census data describing community structural attributes with the NELS base year data. Although there is a two-year lag between the data sets, we do not believe that the analysis was adversely affected. Finally, we incorporated into our data set county typology codes from the Economic Research Service and voter participation 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 also is limited to public school students because we wanted to assess variations that might exist in tax-supported schools located in different places. Because public schools are funded largely by local citizens, the values and attitudes of families and communities can significantly influence the character of these schools and can orient children to their future position in society (Flora et al. 1992).

Our analysis of test scores included 577 schools and 8,756 students. We used weights to correct for oversampling of policy-relevant strata (Owings et al. 1994).

Measurement of Variables^{iv[iv]}

We use a composite score based on standardized math and reading as the dependent variable.

We also use a set of individual and family variables to assess what Coleman (1988a) labeled the "traditional disadvantages" of background. Family income and parents' education reflect resources possessed by the parents that can influence the child's academic aspirations and success. There is ample evidence for the positive influence of family socioeconomic characteristics on academic performance and staying in school. In addition, because blacks are more likely than whites to leave school, we included a race/ethnicity variable (Ekstrom et al. 1986; Natriello, Pallas, and McDill 1986). Finally, gender can affect educational achievement because levels of college attendance are lower among females (Smith et al. 1995).

Family social capital measures determine the opportunity and the process of interaction. Two family structural factors that can affect interaction include the number of parents in the household and the number of siblings. As the number of siblings increases, opportunities for high-quality, uninterrupted interaction between a parent and a child are reduced (Blake 1981; Downey 1995). A third structural variable that we included as a proxy for possible disadvantages in the family is the number of siblings who have dropped out of high school.

Our measures of family process focus on interaction relevant to education: these factors include nurturing activities (parents express expectations to the child about attending college; and child discusses school matters with parents) as well as monitoring efforts (whether parents check on homework; how much parents limit TV viewing; the amount of time the child spends at home alone after school with no adult present). These measures have shown strong effects on educational outcomes in earlier studies (Beaulieu et al., 2001; Israel et al., 2001; Smith et al., 1995).

Following Israel et al.'s (2001) work, the structural attributes of community social capital that we include here measure the extent of, and opportunities for, community action. Socioeconomic capacity, is a composite measure based on seven highly interrelated indicators: diversity of county employment (a measure of the concentration within the distribution of occupations),^{v[v]} percentage of unemployed householders, poverty rate, inequality in wealth (measured with a Gini concentration coefficient), median income, inequality in income (measured with a Gini concentration coefficient), and mean education level (based on a four-point scale). Low capacity is indicated by lower levels of employment diversity, such as in a one-industry town, where most people possess the same skills and experiences. This situation can constrain residents' capacity to address a broad range of community activities. Similarly, high levels of poverty depress capacity and contribute to a decrease in past community activeness and current community mobilization (Zekeri et al. 1994).

Isolation is measured with two indicators: county type (metro core, other metro, adjacent nonmetro, and nonadjacent nonmetro) (Butler and Beale 1994); and the percentage of employed persons who commute to work outside the county. Nonadjacent nonmetro counties have lower population densities and are remote from resources; the result is a milieu that can inhibit extensive networks of relationships (Wilkinson 1991). Finally, commuting means that residents are isolated temporally. Localities with a high percentage of commuters display less solidarity, a less extensive pattern of past community activeness, and less community mobilization (Zekeri et al. 1994).

Instability is measured with the percentage of the county's residents living in the same

county as they did five years earlier. A low percentage of residents who remain in the same county suggests that more relationships have been disrupted, including those with youths. Finally, we include a single measure of inequality and disaffection – the voter participation rate. A low voting rate indicates a moribund democracy and, in turn, a higher potential for a disaffected community (see Israel et al., 2001; Putnam 1993).

The process measures of *community social capital* focus on the extent of students' social integration in the community.^{vi[vi]} Social integration refers to relationships within and between groups that contribute to a person's attachment to these groups and to his or her desire to conform to the groups' norms and expectations (Weidman and Friedmann 1984). We include three measures designed to represent social integration: the number of times a student changed schools since first grade, the student's participation in a religious group, and the number of community organizations in which the student has been involved.^{vii[vii]} Children who move frequently are often unable to develop a sense of integration into a community's social structure, and consequently are hampered in establishing long-term relationships with individuals (Smith et al. 1995). Similarly, a student's involvement in a local religious organization facilitates relationships with nonfamily youths and adult members. Likewise, the more groups (e.g., scouts, boys' and girls' clubs, sports programs) to which a student belongs, the greater the likelihood that he or she will establish ties with other youths and adults. Collectively these resources provide a support system to students beyond that of the family (Israel et al., 2001).

The measures for *school social capital* structure include school size and resources, composition of the school's students, qualifications of teachers and staff, and the school's climate. School size was measured by grade 8 enrollment and resources by district expenditures per student. Increased school size is linked to higher levels of dropouts, greater absenteeism, lower academic performance, and lower participation in school activities (Barker and Gump 1964; Lambert n.d.; Lindsay 1982; Sher 1989; Walberg and Fowler 1987). Higher per-student expenditures can translate into better facilities, improved programs, and more highly qualified faculty, thereby improving educational achievement. Though many studies have found no relationship between expenditures and achievement, those which have found this relationship usually do so when increased resources are devoted to the programs in which students participate (Stockard and Mayberry 1992). The student-teacher ratio, which is affected by resource levels, is a proxy for class size. Small class size are associated with higher achievement and reduced discipline problems, which, in turn, can increase staying in school (Anderman & Kimweli, 1997; Bryk et al., 1993; Flinn, 1998). The percentage of a school's student population that qualifies for free or reduced price lunch is included as measures of the school's student body composition.

Finally, several measures of learning environment and school climate are included. These are an 3-item index on school spirit, student-teacher relationships, and punishing misbehavior, an 11-item index on the extent of school problems, and a four-item index of the value placed on academics. Students who find themselves embedded in an environment where there is support for high academic performance tend to perform better academically (Lee and Smith, 1996). In addition, when problem behaviors on the part of students are kept low, the learning environment is enhanced and achievement increased (Anderman & Kimweli, 1997; Bryk et al., 1993; Parcel and Dufur, 2001).

Process attributes of *school social capital* focus on the extent of a student's social integration in the school. Measures of integration in the school setting are the number of clubs in which a student is involved, the amount of discussion between a student and his/her teachers, and the student's belief about how nurturing his/her teachers are. Students who are accorded the

opportunity to be involved in school activities and to take on positions of responsibility, feel a greater sense of integration in the school and as a consequence, seem to thrive academically (Flinn and Rock, 1997). Similarly, students who develop caring relationships with teachers, and who see these individuals as role models, are more inclined to want to succeed in school (Noddings 1988; Wermer and Smith 1989).

We also included three measures about contact between parents and the school: involvement in a PTO, in other school organizations, and the amount of contact concerning academics, discipline, fund raising, and other activities. When parents have contact with teachers, they can better monitor their child's activities and provide mutual support in the same way that knowing the parents of friends outside of the school. Students whose parents are involved in their schools, irrespective of family SES, perform better in their academic courses and have less propensity to drop out of high school (Comer 1984; Stevenson and Baker 1987; Parcel and Dufur 2001; Walberg 1984; see. McNeal 2001 for contrary findings).

Analysis

To make inferences about U.S. public schools and their students, we used a multilevel model with two levels, the student and school/district. We employed a special case of linear mixed models, a hierarchical linear model (HLM), to examine students' 8th grade (base year) standardized composite math/reading test score.^{viii[viii]}

Results

Because the test score composite was standardized, students in the analytic sample scored an average of 52.0, with a range of 31.0 to 100.0. Table 1 presents results for the regression of the dependent variable -- score on the math and reading standardized tests -- on the independent variables.

The results are consistent with previous status attainment research in that individual and family background characteristics are important influences on educational achievement. Children whose mother or father attended college had higher test scores (an average of nearly 2.5 points) than those that did not. Consistent with expectations, family income was a significant factor, more so for students living in non-adjacent nonmetro counties where the affect was double of that for students in metro core counties. Males also scored somewhat higher than females. Perhaps most important, there were significant differences among racial-ethnic groups in most county types. Black students were at a considerable disadvantage in all locations, though less so in metro counties. Hispanic students also faired poorly, more so in both adjacent and non-adjacent nonmetro counties.

Next we assess whether family social capital exerts a significant influence on educational achievement. In keeping with earlier research (Israel et al. 2001; Smith et al. 1995), family structure influences test scores. Students living with a single parent obtained higher test scores than those with two parents or other family arrangements. The number of siblings is a significant negative factor influencing test scores. Test scores also were reduced when the child had one or more siblings who had dropped out of high school. This suggests that there is a weak family environment with little support for academic progress.

Table 1. Regression Coefficients Showing the Effect of Family, Community and School Social Capital on Test Scores.

Explanatory Variable	Parameter Estimate	P-value
<i>Individual and Family Background</i>		
Gender		
Female	34.668	.000
Male	35.352	.000
Race/ethnicity		
Metro Core - Other (includes white, non-Hispanics)	-.928	.424
Metro Core - Black	-5.426	.000
Metro Core - Hispanic	-3.533	.006
Other Metro - Other	-2.225	.049
Other Metro - Black	-6.664	.000
Other Metro - Hispanic	-3.735	.004
Nonmet Adj. - Other	-3.119	.019
Nonmet Adj. - Black	-6.815	.000
Nonmet Adj. - Hispanic	-5.984	.007
Nonmet Nonadj. - Other	.000	--
Nonmet Nonadj. - Black	-6.014	.000
Nonmet Nonadj. - Hispanic	-4.073	.002
Family income		
Metro Core	.021	.000
Other Metro	.026	.000
Nonmet Adjacent	.015	.174
Nonmet Nonadjacent	.041	.000
At least one parent has a college education	2.441	.000
<i>Family Social Capital</i>		
Structural Attributes		
Family structure:		
Single parent	1.958	.005
Two parent	.879	.185
Other	.000	--
Number of siblings	-.317	.000
Sibling(s) dropped out of school	-.363	.053
Process Attributes		
Discuss school plans with parent(s)	3.555	.000
Parents expect child to attend college	1.689	.000
How often parents limit TV time	.781	.000
Parents check homework		
Metro Core	-1.235	.000
Other Metro	-1.113	.000
Nonmet Adjacent	-1.137	.000
Nonmet Nonadjacent	-.698	.013
Time alone after school		
Metro Core	-.417	.003
Other Metro	-.280	.043
Nonmet Adjacent	-.190	.367
Nonmet Nonadjacent	-.999	.000
<i>Community Social Capital</i>		
Structural Attributes		

Community socioeconomic capacity		
Metro Core	.300	.450
Other Metro	.937	.004
Nonmet Adjacent	.613	.291
Nonmet Nonadjacent	-.442	.467
Percent voter participation (1988 presidential election)	4.903	.002
Percent commuting to another county	-.913	.202
Percent living in the same county	<u>-3.760</u>	.018
<i>Process Attributes</i>		
Number of moves since first grade	-.203	.002
Involvement in a religious group	2.063	.000
Number of non-religious groups		
Linear term	.513	.004
Quadratic term	-.195	.000
<i>School Social Capital</i>		
<i>Structural Attributes</i>		
Core expenditures per student	.00024	.064
Percent of students on free or reduced price lunch		
Metro Core	-.040	.003
Other Metro	-.017	.211
Nonmet Adjacent	.018	.376
Nonmet Nonadjacent	-.090	.000
School emphasizes academics	2.765	.000
Extent of school problems	1.246	.012
Positive school atmosphere	1.636	.012
<i>Process Attributes</i>		
Number of school clubs involved in	.170	.000
Teachers nurture student	.778	.000
Teachers and student talk outside of class	-.323	.000
Student's parents contact the school	-2.423	.000
Parents involved in parent-teachers organization	.359	.000
Parents involved in other school organizations	.688	.004

The process attributes of family social capital were important in shaping a child's academic performance. Students are more likely to stay in school when they discuss school programs with their parents, if at least one and preferably both parents expect them to attend college, and if parents limit the amount of TV time. When parents were involved in monitoring activities, which we believe indicates a student is less disciplined, the student scored lower on the tests. This factor was strongest for students living in metro core counties. Similarly, students who spent more time alone after school performed less well on the tests. The affect was most pronounced for students living in non-adjacent nonmetro counties (i.e., the most rural locations).

Results presented under "community social capital" in Table 1 provide the basis for addressing whether community social capital influences students' achievement. Among the community structural attributes, the influence of socioeconomic capacity varied among the

county types, with students living in other metro counties differing from those living in other areas. Though many other metro counties have large numbers of poor, those with a relatively high socio-economic capacity are better positioned to facilitate academic success. A second structural factor, the percent of residents living in the same house, had a negative effect on test scores. This suggests that communities having higher residential stability do not build networks which support educational success. The percent of employed who commute outside the county also had a negative effective on test scores while voter participation showed a strong positive influence of test scores. Students who live in communities where civic engagement is high apparently benefit from this form of social capital. In sum, the community social capital structural attributes exert a significant net influence on students' test scores and one important component is the type of county, which moderates the effect of a number of other attributes.

Three process measures of community social capital are influential on staying in school. Students who had made numerous moves from one school to another since entering the first grade performed more poorly than children who had made few or no moves. Repeated moving may inhibit children's and parents' opportunities to develop relationships with people and organizations outside the family. As Coleman (1988a:S113) notes, for parents and children in mobile families, relationships that constitute social capital are severed at each move. Uprooted individuals need time to establish new networks in the destination community (Putnam 1995). Involving youths in a religious group or other youth organizations increased students' test scores, with involvement in a religious group having a larger impact. There was a benefit to participating in one or two non-religious organizations, but involvement in three or more had a negative affect on test scores.

The influence of school social capital are shown in the last section of Table 1. There is a growing literature which shows that resources increase educational outcomes and this study supports that view. Per student expenditures increased students' test scores but the effect is relatively small -- an increase of \$4,000 is required to raise test scores by 1 point. The percent of students who qualified for free or reduced price lunch had a negative effect on test scores, with students attending schools having a large percent of poor students performing at lower levels than students at schools with relatively few poor students. This contextual effect was strongest for non-adjacent nonmetro schools, followed by metro core schools. Students who attended schools which emphasized academic achievement had higher test scores than students at other schools. Likewise, students who attended schools rated to have a more positive atmosphere also performed better. On the other hand, students who attended a school where students reported more problems scored higher of tests than those at schools with fewer problems. This counter-intuitive result needs further exploration.

Several social capital process variables were significant at the school level. Students whose parents were involve in a parent-teacher organization or other school organization were more likely to stay in school. It is likely that this type of parental involvement fostered student-parent and teacher-parent relationships and helped the student stay engaged in school. On the other hand, when parents contacted the school, this had a negative effect on staying in school and likely reflects instances in which the student was involved in a discipline incident or academic problem. Measures of involvement in student organizations and student-teacher relationships showed expected effects on test scores, with students who felt teachers were nurturing benefiting the most. Though the amount of time teachers talked with students outside the classroom had a negative effect on test scores, this might indicate that these students needed to be monitored in the same way that parents monitored homework.

Variance Decomposition by Family and Community Variables

Table 2 partitions the variance into the contribution made by the family social capital variables (including the individual and family background attributes), community social capital characteristics, and school social capital attributes. It shows that 10 to 18 percent of the total variance for the math/reading composite occurs between communities, while the remaining 82 to 90 percent occurs within communities (i.e., at the student level). The family variables (which include individual-level control variables) exerted a substantial effect on test scores and accounted for 19 to 24 percent of the total variance for the math/reading composite score. The addition of the community social capital variables, which include the process and structural dimensions of the community accounted for an additional 1 to 3 percent of the variance for the composite score; the effect of the community variables was most evident in nonmetro nonadjacent areas. The impact of school social capital variables also accounted for 1 to 3 percent of the variance, notably in non-adjacent nonmetro counties. Though the variance accounted for by schools appears modest, the results in Table 1 suggests the a number of school social capital factors are important to education outcomes and warrant further study.

Table 2. Summary model statistics for hierarchal linear models of the effect of family, community and school social capital on standardized math/reading test scores.

Model	Metro Core		Other Metro		Adjacent Nonmetro		Non-adj. Nonmetro	
	Level 1: student variance	Level 2: school & community variance	Level 1: student variance	Level 2: school & community variance	Level 1: student variance	Level 2: school & community variance	Level 1: student variance	Level 2: school & community variance
Intercept only	79.916	17.056	91.229	10.289	81.044	8.549	84.820	12.455
Background variables only	75.062	5.198	83.248	6.342	75.919	5.198	76.704	7.627
Background and family variables	68.839	4.762	73.189	4.556	69.380	3.473	69.570	6.812
Background, family and community variables	67.981	3.824	72.395	1.726	68.833	2.507	68.276	5.288
Full model with school variables	66.609	2.392	71.038	1.478	67.191	2.869	66.384	3.894
Model R ²	28.8%		28.6%		21.8%		27.8%	

Conclusions

We have examined the influence of social capital on staying in school. We also elaborated the concept of school social capital and further explored the application of family, community and school social capital to enhancing educational achievement. Our findings reaffirm the significant role of parents' socioeconomic status in shaping their children's educational performance. Children born to well-educated parents tend to perform well academically. In addition to family background attributes, however, social capital available in the family promotes a child's educational achievement further. When youths are provided with a nurturing environment and with guidance on behaviors that are deemed appropriate and inappropriate, the effects on their educational progress are powerful and positive. Community social capital also helps children to be successful. We found that both the process components of community social capital and the structural features of the locality are important influences. Children who have experienced few if any moves since the first grade and are involved in local religious or non-religious groups tend to perform well on standardized tests. This finding suggests that access to adults outside the immediate family has a positive effect on these students, as does the stability of living in a locality for a long period without interruption by a physical move to another school or community.

This study further documents that structure and process attributes of schools can make a difference in educational outcomes. Resources matter and increases in per pupil expenditures can lead to a modest increase in test scores. Emphasizing high academic performance and establishing a positive atmosphere showed strong effects on students' test scores. Perhaps some resources should be directed at helping teachers develop skill in nurturing students, getting more students involved in school organizations, and reducing barriers to getting parents more involved in the school. This study found that parental involvement in schools is an important process factor for obtaining a high test score.

This study also suggests that youths' academic success stands on a three-legged stool – families, communities, and schools. This means that a multi-faceted strategy is needed if America's human capital resources are to be strengthened -- resources that are vital to our country's ability to compete in a global marketplace. But all too often attention is focused on only one of the three legs. Instead, enhancing families' capacity should be viewed as essential for promoting students' educational achievement. This may entail the design and delivery of an array of programs that build parents' competencies, which are crucial to the creation of social capital in the home. They could include tools for promoting high-quality parent-child interactions, for building children's self-confidence and raising their educational aspirations, and for curbing behaviors that inhibit academic progress. The goal is to create a home environment where parent-child relationships are strong, and where parents place a high value on 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 resource for children. The role of community social capital may not directly influence high school students' educational performance, but it may exert indirect effects through the variety of programs, organizations, and activities available in a locality. By these means, citizens can convey the

importance of high educational performance to children.

Localities will differ in their ability to enhance community social capital. Inequality, isolation, dependency, and gaps in the organizational and institutional structure can inhibit community action (Wilkinson 1991). We found that students attending schools in core metropolitan areas face a set of structural conditions – concentrations of poor, minorities, and non-traditional families, which work against academic success. Until these structural deficiencies are confronted, many communities will be less able to muster the social capital needed to make a real difference in local youths' lives.

Schools have a vital role to play but if they are to make a difference, significant barriers in terms of inadequate financial and human resources, as well as limited involvement of parents and other adults, must be addressed. The former will depend on local, state and federal efforts to provide the necessary resources. This will require a good deal more realism and a lot less hypocrisy on the part of voters and government officials. Increasing parental involvement faces its own set of hurdles. It includes that of schools sharing power with parents – something which some teachers and administrators are loath to do. It also will require educational professional to step into unfamiliar territory to reach out to uninvolved parents and discover ways to bring them into the school.

The strategies noted above are only a sample of the activities that can contribute to building family and community social capital. These efforts can increase the social resources that can help youths succeed in school and, later, in the working world. Moreover, they demonstrate a caring family and community environment, which is vital to young people's positive development.

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Appendix Table A1. Variables Used in the Analysis, Variable Names and Data Source, Measurement, and Mean

Variable and Source ^a	Coding Scheme	Mean/ Percent
<i>Dependent Variable</i>		
Standardized Math and Reading Composite Score (BYTXCOMP)	Entire base year sample has mean at 50 and standard deviation of 10	52.044
<i>Student's Background</i>		
Gender (SEX)	Factor with two levels: Female = 0; male = 1	.489
Race/Ethnicity (RACE)	Factor with three levels: other, black (not Hispanic), and Hispanic (mode = other)	.854
Family Income (BYFAMINC)	Linear and quadratic terms, in units of \$1,000 and centered on group mean	.151
Parents' Education (BYPARED)	1= at least one has a college education; 0 = none	.730
<i>Family Structure</i>		
Number of Siblings (BYP32)	Range 0 = none to 6 = six or more	.142
Number of Siblings Dropped Out of School (BYP6)	Range 0 = none to 6 = six or more	2.187
Family Structure (BYFCOMP)	Factor with three levels: living with both parents, single parent, and other (mode = both parents)	.827
<i>Family Process</i>		
Discuss School Matters With Parent(s) (BYS36A-C)	Average response to students' and parents' discussion of (1) school programs, (2) school activities, and (3) things studied in class; each questions range from 0 to 2. (Cronbach's alpha = .61)	1.419
Parents Expect Child to Attend College (BYS48A,B)	Number of parents that student thinks expect him/her to attend college	1.606
Parents Check on Homework (BYS38A)	0 = never, 1= rarely, 2 = sometimes, 3 = often (treated as interval-level)	2.073
How Often Parent(s) Limit TV Time (BYS38C)	0 = never, 1= rarely, 2 = sometimes, 3=often (treated as interval-level)	1.109
Time Alone After School Without an Adult (BYS41)	Number of hours spent alone after school on average, ranging from 0 = none to 4 = 3 or more hours (treated as interval-level)	1.824
<i>Community Structure</i>		
Community Socioeconomic Capacity (P117, P080A, P077, H061, P113, P204 from SDDB)	A standardized composite of highly related district SES measures ^c	-.047
Community Type (BEALE93 from 1989 ERS County Typology Codes)	Factor with four levels: metro other, metro core, nonmetro adjacent, nonmetro nonadjacent (mode = metro other)	.388

Commuting to another county (P045 from SDDB)	Percent of employed who work in another county	.237
Living in the same county (P043 from SDDB)	Percent of population living in the same house as 1985	.797
Voter Participation (Variable 54, ICPSR 0013; Variable 325, ICPSR 9405)	Percent of registered voters in county who voted in the 1988 presidential election	.717

Community Process

Number of Moves Since Grade 1 (BYP6)	Number of times student changed schools since grade 1 (not due to promotion)	1.253
Involvement in a Religious Group (BYS83A)	1= yes; 0 = no	.358
Involvement in Nonreligious Community Groups (BYS83C,D,F,G,H,I,J)	Number of groups in which student is involved, range 0 to 7	1.426

School Structure

Core Expenditures per student (C_COREPP from SSDB Top 100)	Amount in thousands of dollars	3097.78
Percent of poor students (G8LUNCH)	Percent of students on free or reduced price lunch	23.698
Positive School atmosphere (BYS59A-B, BY59M)	This contextual variable represents the mean response of a school's sampled students to 3 items: 'Students get along well with teachers,' 'There is real school spirit,' and 'Misbehaving students often get away with it' (last item reverse coded). Range is 0=strongly disagree to 3=strongly agree.	1.648
Extent of school problems (BYS58A-K)	This contextual variable consists of questions regarding tardiness, absenteeism, cutting class, physical conflicts among students, theft, vandalism, alcohol and drug use, students possession of weapons, and physical/verbal abuse of teachers . [Cronbach's α =.92]	1.070
School emphasizes academics (BYP74A,C,D,G)	This contextual variable represents the mean parent response to (1) school places high priority on learning, (2) my 8 th grader is challenged at school, (3)my 8 th grader is working hard at school, and (4) the school is preparing students well for high school. Range of each is 0=strongly disagree to 3=strongly agree. [Cronbach's α =.78]	2.008

School Process

School club involvement (BYS82A-U)	Number of school clubs that student is involved with.	2.922
Child-teacher communication (BYS51AB, BY51BB, BY51CB, BY51DB, BY51EB)	Average response to amount of discussion with teachers about (1) high school programs, (2) jobs/career, (3) improving school work, (4) courses, and (5) studies. [Cronbach's α =.65]	2.320

Child's teacher is nurturing (BYS59H-J)	Average response to (1) When I work hard on schoolwork, my teachers praise my efforts, (2) in class I do not feel put down by teachers, and (3) most of my teachers really listen to what I have to say. Range of each is 0=strongly disagree to 3=strongly agree. [Cronbach's α =.65]	2.124
Parents involved with PTO (BYP59A-D)	Average of parent's responses to (1 belong to parent teacher organization, (2) attend PTO meetings, (3) take part in PTO activities, and (4) act as volunteer at the school. [Cronbach's α =.75]	.988
Parents involved with other organizations (BYP59E)	Includes any organization involving several parents from the community, not including PTO.	.263
Parents contact school (BYP58A-F)	Average response to: contacted school regarding (1) academic performance, (2) academic programs, (3) behavior, (4) fund raising, (5) information for school records, and (6) doing volunteer work. Range of each is 0=never to 3=four or more times. [Cronbach's α =.69.]	.391

^aUnless noted, the source is the National Education Longitudinal Survey.

^bThe proportion for the modal category is reported for multinominal variables; the proportion for the binomial variables is shown when the attribute is coded 1.

^cThe six socioeconomic measures are district poverty rate (P117), district median income (P080A), district employment diversity as measured by Simpson's Diversity Index of 18 industry categories (P077), concentration of wealth as measured by a Gini of the value of residents' homes (H061), percent of unemployed householders in district (P113), and district's mean education level on a four-point scale (P204) (Cronbach's α = .92).

Notes

i[i]. 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).

ii[ii]. According to Hobbs (1995), many rural communities cannot fully capture the benefits of their investments in children because many leave the community upon graduation from high school. This situation creates a disincentive for rural communities because urban and suburban areas are the major beneficiaries of their investments (Lichter, Beaulieu, et al. 1993).

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

iv[iv]. Appendix Table A1 details the coding scheme employed for the variables in this study.

v[v]. We calculated the county's diversity in employment using Simpson's diversity index (Simpson 1949).

vi[vi]. Measures of other aspects, such as aggregate measures of community-wide social networks, were not available.

vii[vii]. We assume that participation in religious and non-religious groups involved youth in positive relationships with adults and peers but information about the amount and nature of the relationships is not available (Carbonaro, 1999).

viii[viii]. A detailed discussion of the models used for the analysis is available from the senior author.