The School Compositional Effect of Single Parenthood on 10th-Grade Achievement

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It is widely acknowledged that single parenthood carries educational disadvantages for the individual children of single parents. Using NELS data, the author also found a detrimental contextual effect on 10th-grade mathematics and reading achievement associated with attending a school in which a high concentration of children are from single-parent homes. This effect was evident even when individual demographic characteristics and family background were controlled. To account for this contextual effect, the author investigated the mediating role of a school's net socioeconomic status (SES) and net social capital, as indicated by parents' social relations and networks with other parents. She found that both can account for differences in mathematics and reading achievement between schools enrolling less than 25 percent and schools with 25-49 percent of students from single-parent families. Furthermore, there is evidence that even the academic disadvantage of attending schools with 50 percent or more students from single-parent families can be offset when social relations and networks among parents are strong.

In 1966, Coleman et al. found that schoolmates affect students' academic achievement. Subsequent explorations of the impact of school composition led to near unanimity that a school's average socioeconomic status (SES) matters for all its students. That is, sociologists generally accept that schools with greater percentages of students from high SES family backgrounds provide more effective learning environments and lead to higher academic achievement for all (for reviews, see Gamoran 1992; Willms 1992).

Investigations of other school compositional influences beyond family SES were prominent in early research on school effects (see, for example, Alexander and Eckland 1975; Alwin and Otto 1977; Rutter, Maughan, Mortimore, and Ouston 1979). However, recent studies of school effects have focused primarily on the organization and practices of schools. Only rarely have sociologists returned to the independent impact of school composition. Today, when the effect of school composition is estimated, it is most often used as a background control in explorations of the effect of school organization and practice.

Yet, even as the search intensifies for organization-level factors that contribute to the effectiveness of schools, researchers who control for the impact of students' inputs continue to report such effects of school composition as students' average academic proficiency, students' at-risk levels, and the proportions of minority students' SES (Bryk and Thum 1989; V. E. Lee and Bryk 1989). Although these compositional effects are often found to be greater than the impact of other school-level inputs and despite powerful multilevel methods used in exploring school effects, few researchers have

used multilevel modeling to study the influences of school composition.

In this article, I focus on students' family structure as one school compositional factor that may affect the overall achievement of students. Although the family has long been recognized as crucial for a child's school success, its relevant features clearly extend beyond parents' education, occupation, or income—factors that are typically captured by SES. One of the most salient characteristics of families today is children's living arrangements with parents because children from single-parent families make up increasing proportions of the student population. The challenge for sociologists of education is not only to investigate the impact of family structure on individual students' education, but to learn whether and how a school's concentration of students from single-parent families affects the social context for learning for *all* students, regardless of an individual student's family type.

In this article, I estimate the compositional effects on achievement of a school's concentration of students from single-parent families. To interpret the findings of these effects, I build on the work of family sociologists who study single parenthood and of sociologists of education who study school effects. An overarching empirical question provides the focus: Does a school's concentration of students from single-parent families affect school achievement for all children, above and beyond the effect of single parenthood on individual children? To interpret my positive findings of this school compositional effect, I further examine two possible mediating school factors: the average economic status of the student body and the amount of social capital, in Coleman's (1988) sense of parents' involvement with the school and parents' social networks.

CONCEPTUAL FRAMEWORK

Social scientists have long recognized that the family is one of the principal contexts of a child's emotional and intellectual development. The influence of the family on children can be understood at two levels: individual and aggregate. The distinction between these levels of family influence can be conceptualized using the bioecological model of Bronfenbrenner (1979, 1986), who classified research paradigms in the "microsystem" and the "mesosystem."

The intrafamilial settings in which parent-child relationships are developed constitute a microsystem, and most research in sociology of education has been in this area. On the one hand, social structuralists emphasize the importance of family background for children's schooling and often measure it by SES—an index of parents' education, income, and occupational prestige. On the other hand, social psychologists emphasize social processes in the home, conceptualizing the family's influence on a child's academic attitudes and behavior as parental expectations and aspirations, parents' communication with the child, or parenting styles (see, for example, Sewell and Hauser 1980). Clearly, the intrafamilial environment includes the family's structural characteristics, such as parental income and education. It also includes the interactive processes that Coleman (1988) referred to as "social capital." Within the family, the microsystem social capital consists of dyadic parent-child relationships that independently contribute to a child's educational success.

Beyond the family is the mesosystem, the external social context that has a triadic relation with the family and the child. Research in this area

has moved to the extrafamilial settings in which the family is nested. Examples from the sociology of education include studies of the family's connection with the school's "institutional agents" (Stanton-Salazar and Dornbusch 1995), as well as of school compositional effects. Clearly, the influence of individual children's family backgrounds extends beyond the children's own families to the schools the children attend. Of the various resources that influence a school's effectiveness, one of the most crucial is the familial resources available to students and the extent to which these resources can be shared with other children.

Research on school effects has revealed an independent influence of the school's average SES: Students achieve more in schools with high SES than in schools with low SES. Ho and Willms's (1996) study went beyond the structural characteristics of students' family background to document the importance of the aggregate amount of parents' participation in schools. It found evidence of school-based social capital because the school-level measure of parents' participation in schools had a positive effect on the achievement of eighth-grade students over and above the effect of individual parents' participation.

To understand the role of school-based social capital, one must move from the perspective of an individual family to the perspective of families as an aggregate. A distinctive feature of the concept of social capital, in Bourdieu's (1986:248-49) words, "is the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition." Unlike other conceptualizations of capital (such as cultural capital and human capital), social capital is not independent of its individual agents. Rather, it inheres in the collectivity.

In his discussion of social capital, Coleman (1988) emphasized the notion of "intergenerational closure," a web of relationships and networks of adults that supports children's education. Parents must be connected to their children's friends through their relationships with other parents if they are to communicate the social norms needed for children's academic development. Outside the family, such interconnections between adults and children may be considered school-based social capital that is available for students' learning. Thus, Coleman and Hoffer (1987) attributed high achievement in Catholic schools to the fact that Catholic schools feature strong social relationships among families and school personnel by virtue of common membership in the church. Similarly, studies of neighborhood effects have found that mean family income in a community, the percentage of families in poverty, and the percentage of families with children headed by women contribute to achievement (Brewster 1994; Duncan 1994). These findings may be examples of community-based social capital that exert an independent influence above and beyond the influence of individuals' own families.

The importance of intergenerational closure in child development is manifest in the *aggregate* effect of the family in the extrafamilial environment, where the influence of the family goes beyond the family's function as a provider of material and nonmaterial resources to individual members. When parents are engaged in social networks, they act on behalf of and for the interests of their own families. They also benefit by receiving ongoing feedback on effective child-rearing strategies and informa-

tion on the policies of their children's schools, teachers, and peers that may allow individual families to channel their resources effectively into their children's success in school. In this article, I present an analysis of the effects of family structure in the mesosystem and show that the structural characteristics of single parents as a group can be understood in light of social capital in the school—parents' participation in school and their networks and acquaintances.

PREVIOUS STUDIES

Single Parenthood and Children's Schooling

During the past three decades, because of increased rates of divorce, separation, and childbearing outside marriage, more and more American children have been living with only one parent. The proportion of children under age 18 who lived with one parent grew from 12 percent in 1970 to 27 percent in 1992 (U.S. Bureau of the Census 1992), and it was projected that more than half the children born in the United States in the 1990s will spend some of their childhood in single-parent families (Sweet and Bumpass 1990).

There is much evidence that students in single-parent families are at a greater risk than are students in two-parent families of educational failure—either by failing to learn while in school or by dropping out of school. These detrimental effects of single parenthood are found even when SES, ethnicity, and other family background factors are controlled (Entwisle and Alexander 1995; McLanahan and Sandefur 1994; Zill 1996).

Two broad explanations have been offered for the detrimental impact of single parenthood. One interpretation focuses on the lack of economic resources of most children in single-parent families, who are generally poorer than are those in two-parent families (McLananhan 1985). The poverty rate for female-headed families with children is 44 percent, five times the poverty rate for married-couple families with children (O'Hare 1996). For this reason, studies that have controlled for family SES have found smaller effects of single parenthood than have studies that did not. The income differences between single-parent and two-parent families can account for up to half the gap between these groups in children's test scores, grades, college enrollment, and college graduation (McLanahan and Sandefur 1994).

A parallel, but distinct, explanation of the detrimental effects of single parenthood on children's schooling emphasizes the dearth of social capital in single-parent families. Coleman (1988) contended that the number of parents residing in the home is itself an indicator of the social capital available in a family. Because single parents are less able to spend time with their children, he argued, they have much fewer overall interactions with their children than do those in two-parent families, so their children have a less supportive learning environment, net of their parents' finances and education. Corroborating Coleman's assessment, subsequent empirical studies found that single parents spend less time on general supervision and the day-to-day monitoring of their children's schoolwork and have lower educational aspirations and expectations for their children. These aspects of single parenthood are responsible for their children's negative educational outcomes (Astone and McLanahan 1991). After SES is controlled, single parents have lower levels of verbal communication with their children

about school matters than do parents in two-parent families (S. Lee 1993).

Further investigations have related single parenthood to school- or community-based social capital. However, virtually all of them have measured school- or community-based social capital at the *individual* level. Downey (1994) found that individual parents' involvement in school (as indicated by attendance at school meetings and events, volunteer efforts in school chores, and participation in parent-teacher associations) partly explains the educational disadvantage of children who live only with their mothers. S. Lee (1993) attributed children's academic and behavioral problems to the low level of acquaintance of their single parents with the parents of their friends. And single mothers frequently move from richer to poorer communities after their marriages break up. Not only does moving disconnect the family from the community and erode access to community resources, but changing schools is itself a strong predictor of school failure (Teachman, Paasch, and Carver 1996).

Concentration of Single Parents as School Context

The findings of previous studies of the individual-level effects of single parenthood provide insights into the possible school compositional effect of students' family structure. First, given the literature on the relationship between single-parent families and poverty, one would expect that schools in which students from single-parent families predominate would have fewer overall economic resources available for their students. It is also likely that these schools would be in poorer school districts, where educational spending is relatively low because of many states' reliance on property taxes for educational funding. In addition, it is difficult for these schools to raise private funds or to mobilize parents to engage in effective political action. In such environments where overall financial resources are low, children's learning may be hampered.

Second, schools with greater concentrations of students from single-parent families generate limited social capital. To the extent that single parents are less involved in their children's education, one may expect that fewer parents would be available for school chores, meetings, or special events in schools in which children from single-parent families predominate. As a result of this lack of participation in school, fewer parents would become mutually acquainted or network with other parents. Thus, the level of parents' participation in school and acquaintances with other parents would be generally low in those schools. Schools that build on weak networks of parents would be less responsive to parental concerns, and children would be exposed to a more limited range of social support from adults. Furthermore, children who go home with school friends would be less likely to be supervised by their friends' parents.

THE STUDY

Data and Sample

To investigate whether the school-level effects of single parenthood can be explained by the economic status of schools and school-based social capital, I used data from the base year and first follow-up of the National Education Longitudinal Study (NELS). Conducted by the National Opinion Research Center for the National Center for Educational Statistics (NCES), NELS is a nation-

ally representative sample of public and private schools with eighth grades in 1988, which was the base year. The first follow-up study was conducted in 1990, when most students surveyed in 1988 had continued on to the 10th grade. Students in the 10th grade are 15 year olds who are in the developmental stage in which they want to assert their independence from their parents, but are the most susceptible to the influence of peers and other extrafamilial environments. Therefore, 10th graders are appropriate subjects for a study of school compositional effects.

NELS collected information from parents, teachers, school administrators, and students. Its questions reflect a focus on educational processes and outcomes pertaining to students' learning and the effects of schools on equal educational opportunities. NELS is particularly suited for the study of school effects because it identified school attributes that are associated with academic achievement and tested students in the areas of reading and mathematics (for a complete description of the survey design, see NCES 1992).

The first phase of the sampling included approximately 26,000 eighth-grade students attending approximately 1,000 schools throughout the country in 1988. A subsample of 20,000 of these students were included in the first follow-up study in 1990, which had the same student, teacher, and school administrator components as the base-year study but no parent survey.

Since the focus of my study was the impact of family structure, I excluded from my sample all students whose family structure was unknown or missing in the survey data. The sample of students was also restricted to white, black, Hispanic, and Asian American students and excluded physically handicapped students and those whose scores on the mathematics and reading tests were missing from NELS.[1] The sample of schools was restricted to schools with nonmissing data on all school-level variables used in the study and those with at least 5 students from the longitudinal cohort. With all these restrictions in the school and student samples, my analysis was based on data from 654 schools and 10,399 10th-grade students, 15 percent of whom were from single-mother families; 3 percent, from single-father families; 12 percent, from stepfamilies; and 2 percent, from guardian families.[2]

Variables and Measures

Details of all school-level and student-level variables, together with summary statistics, are presented in Table 1. The dependent variables were the scores on the 10th-grade mathematics and reading tests—the "IRT-Estimated Number Right" scores, which were constructed on the basis of item response theory (IRT) (for details, see NCES 1992:19-20). In a multivariate analysis, the students' eighth-grade IRT scores were entered as control variables, so the results reveal the determinants of *gains* in achievement between 1988 and 1990. This method extended my previous research (Pong 1997) on the contextual effect of single parenthood on eighth-grade achievement.

The effects of two complimentary sets of independent variables—individual-level student variables, drawn primarily from the first follow-up student file, and school-level variables—are reported here. The independent variables of interest are the school's percentage of single parents and school-based indicators of social capital. The concentration of students

Table 1. Sample Means, Standard Deviations, Range, and Description of All Variables

Variables	Description (NCES variable names)	Mean	*SD*
1. School-level Variables (J = 654)			
25–49 percent from single-parent homes	F1C28=2, reference group is 0–24%	.48	.50
50 percent or more from single-parent homes	F1C28=3,4,5, reference group is 0–24%	.08	.27
Percentage free school lunch	F1C30A	18.18	20.20
High concentration of minority students	Minority students ≥ 40% (F1C27A, B, D, E)	.18	.39
Private	G10CTRL1=3–5, reference group is public school	.10	.30
Catholic	G10CTRL1=2, reference group is public school	.06	.24
Urban	G10URBAN=1, reference group is suburban school	.28	.45
Rural	G10URBAN=3, reference group is suburban school	.33	.47
10th-grade enrollment (per 100 students)	F1C3 (divided by 100)	2.95	2.16
Mean parental school participation	Average score of parental school participation, standardized	.00	1.00
Level of parental acquaintances	Percentage of students reporting that their own parents know many of their friends' partents	31.81	15.57
School mean SES	Average SES within school (F1SES)	.07	.99
2. Student Variables (N= 10,399)			
School Outcomes			
1992 mathematics achievement	Math IRT-score in 1992 (F12XMIRR)	4.46	13.96
1992 reading achievement	Reading IRT-score in 1992 (F12XRIRR)	31.68	9.98
Prior Achievement			
1988 mathematics achievement	Math IRT-score in 1988 (BY2XMIRR)	37.85	12.16
1988 reading achievement	Reading IRT-score in 1988 (BY2XRIRR)	28.05	8.68
Family Background and Parent's Characteristics			
SES	NCES composite (F1SES)	.04	.99
Single-mother family	Student reported living with mother only (F1S92A, B, D) Reference group: living with both natural parents	.15	.35
Single-father family	Student reported living with father only (F1S92A, D, E) Reference group: living with both natural parents	.03	.18
Stepfamily	Student reported living with a stepparent (F1S92A, B, D, E) Reference group living with both natural parents	.12	.33

Continued

Table 1. Continued

Variables	Description (NCES variable names)	Mean	*SD*
Guardian family	Student reported living with a guardian. Reference group: living with both natural parents	.02	1.00
Knew many other parents	F1S103 = 3, reference: parent does not know or know some other parents	.33	.46
Discuss school matters	Discuss with parent about school courses or programs, school activities, and things studied at school (F1S105A, B, C combined and standardized)	.00	1.00
School participation	Parent attends school meetings and participates as school volunteer (F1S106A, D combined and standardized)	.00	1.00
Ethnicity and Gender			
Black	F1RACE = 3, reference group is white	.08	.28
Hispanic	F1RACE = 2, reference group is white	.10	.29
Asian	F1RACE = 1, reference group is white	.06	.23
Male	F1SEX = 1, reference group is female	.49	.50

from single-parent families was based on reports from school administrators, who were asked to estimate the percentage of 10th graders in their schools who were living with single parents. A problem associated with these types of school-level variables is that since they rely on administrators' impressions, they may be inaccurate. The alternative strategy, widely used in contextual analysis, is to create variables by aggregating information from individuals sampled in units. Nevertheless, in analyses not reported here, I found that either method used to create a single-parent-concentration variable produced the expected (negative) effect. Therefore, for simplicity of presentation, I present only the variable created from the administrators' reports.

The original variable of the proportion of students from single-parent families was coded in six categories: 0 percent, 1–24 percent, 25–49 percent, 50–74 percent, 75–99 percent, and 100 percent. Because there were fewer than six schools in each extreme category of 0 percent, 75–99 percent, and 100 percent, I grouped these categories with their adjacent categories of 1–24 percent and 50–74 percent. Thus, I was left with two dummy variables (1) whether or not over 50 percent of a school's students were from single-parent families and (2) whether or not a school had 25–49 percent of its students living with single parents. In each case, the reference group was schools in which less than 25 percent of the students were living with single parents.

School-based social capital was gauged by two indicators created from responses to students' answers to questions about their parents, since information from the school administrators was not available: parents' participation in school and parents' acquaintances. Parents' school participation was based on the aggregate of individual students' reports to the questions: "How often do your parents attend a school meeting?" and "How often do your parents act as a volunteer at your school?" To each question, students responded on a scale of 0 to 2, indicating "never," "once or twice," and "more than twice." I summed these responses for each 10th grader and then averaged the scores for individual students in each school. Finally, I standardized the scores to create a school-level standard score of parental school participation.

Social capital was based on the students' reports of their parents' acquaintance with other parents at school. It indicated simply the percentage of students in each school who responded "Yes, many parents" to the question: "Do your parents know the parents of your closest school friends?" (the alternative answers were "No," or "Yes, some parents").

The amount of social capital in a school or community is likely to be associated with other school and community factors. For example, parents of students in Catholic schools, small schools, or rural communities are better able to generate greater intergenerational closure because of their church affiliations, closer proximity to each other, and fewer social alternatives (Hoffer 1990). These factors need to be taken into account in an investigation of the contextual effects of single parenthood. Thus, I included Catholic school, rural location, and 10th-grade enrollments in the analysis as controls.

Because much of the effect of a high concentration of single parents reflects the economic deprivation of the student body, gauging the role of social capital makes it necessary to control for the school's economic status. Toward this end, I included two school variables from the administrators' report: the percentage of stu-

dents receiving free school lunches and whether the schools were private or public. I examined private schools in a multivariate analysis alongside Catholic schools; the comparison group was public schools. A school's SES can also be measured by the mean of individual students' SES in the school. I used this school mean SES variable to cross-validate the results of the school compositional effect of students' family structure.

Since single parenthood is known to be more prevalent among blacks and Hispanics, schools with high concentrations of students from single-parent families tend to be minority schools. To differentiate the school compositional effects of single parenthood, it is necessary to include a variable indicating whether or not a school contains a high percentage of minority students. Following V. E. Lee and Bryk (1989), I used 40 percent as a threshold to define whether or not a school had a high concentration of minority students.

At the individual-student level, the following analyses also controlled for students' gender, ethnicity, family structure, SES, and home-based social capital, in addition to eighth-grade achievement levels. Students' family structure was represented by five categories—two-parent family, single-mother family, single-father family, stepfamily, and guardian family—with two-parent family the reference group. Home-based social capital was measured by three variables: discuss school matters, school participation, and knew many other parents. Discuss school matters was the frequency of discussion between the child and his or her parent about school courses or programs, school activities or events, and things studied in school. School participation was the frequency with which parents acted as volunteers in school and attended school meetings. Knew many other parents was based on the report of a 10th grader that his or her parents knew many of his or her close school friends.

Method

This study used hierarchical linear modeling (HLM), a class of multilevel contextual analysis. The HLM analysis was carried out in several stages. First, the baseline model, with only student-level variables, was estimated for the student's scores on the mathematics and reading achievement tests. Next, in three successive steps, school contextual properties were added to the baseline model of individual student effects. These separate HLM models each contain additional sets of school-level covariates to produce estimates for the school parameters. From these parameters, one can see if schools differ in their mathematics and reading achievement with regard to the degree of concentration of students from single-parent families.

RESULTS

At the school level, several unsurprising findings emerged from the univariate analysis (see Table 2). Schools with higher concentrations (25–49 percent and 50 percent or more) of students from single-parent families differed in many respects from schools with lower concentrations (0–24 percent). They tended to

1. provide more students with free school lunches
2. have greater proportions of minority students.
3. be relatively large public schools located in urban areas
4. have lower measures of school-based social capital.
5. have lower levels of parental school participation.

Table 2. Mean Values of School-level Variables, by the Degree of Concentration of Students from Single-Parent Homes

Variables	Low Concentration (0–24 percent)	Medium Concentration (25–49 percent)	High Concentration (50 percent or more)
Percentage free school lunch	14.66	19.97	26.80
High concentration of minority students	.10	.23	.39
Private	.15	.05	.06
Catholic	.09	.04	.02
Urban	.28	.26	.39
Rural	.34	.33	.24
10th-grade enrollment	2.43	3.35	3.42
Mean parental school participation	.27	-.22	-.16
Level of parental acquaintances	35.50	29.83	23.64
Total number of schools	286	317	51

HLM models were then estimated to differentiate the aggregate- level from the individual-level effects.[3] The results for mathematics achievement are presented in Table 3, where school compositional effects are listed under the school-level equation. In the absence of all other school variables (see Model 1), schools with greater concentrations of children from single-parent families demonstrated lower levels of overall school achievement. Compared to schools with a low concentration (0–24 percent) of children from single-parent families, those with a medium concentration (25–49 percent) were predicted to have lower 10th-grade mathematics scores. Attending a school with a high concentration (50 percent or more) of children from single-parent families is twice as detrimental to mathematics achievement as attending a school with a medium concentration.

The school compositional effect of single parenthood dropped by half after the school's minority status and SES measures—free school lunches and school sector (Model 2)—were controlled. This finding suggests that a large part of the school-level effect of single parenthood is due to the economic and minority status of the student body. Students who attend schools with a greater concentration of children from single-parent families tend to be of minority and lower SES backgrounds. Because schools of minority and low SES status are associated with lower mathematics achievement, they mediate the negative school compositional effects of single parenthood. Controlling for these disadvantageous school factors reduces the detrimental effect associated with a school's concentration of children from single-parent families.

In Model 3, school-based social capital measures were entered into the equation. Note that the differences in mathematics achievement between a low (0–24 percent) and a medium concentration (25–49 percent) of single-parent families can be completely explained by the differentials in school-based social capital, in addition to a school's economic status. Recall from Table 2 that schools with greater concentrations of single parents tended to have larger enrollments and low levels of parental

Table 3. Estimates from Multivariate (HLM) Analyses of 10th-Grade Mathematics Achievement, NELS:88 (N = 10,399 students from 654 schools)

	1990 Mathematics Achievements				
Predictor Variable	Model 1	Model 2	Model 3	Model 4	Model 5
School-Level Equation					
25–49 percent from single-parent homes (1)	-2.355**	-.964*	-.696	-.410	-.988
50 percent or more from single-parent homes (2)	-4.740**	-2.381**	-2.180**	-1.990**	-4.827**
Percentage free school lunch		-.114**	-.091**	—	-.091**
High concentration of minority students		-2.973**	-3.783**	-2.367**	-3.708**
Private school		6.908**	4.833**	—	4.745**
Catholic school		1.229	-.047	-.151	-.126
Urban			-.401	.403	-.336
Rural			-.973	.520	-.981
10th-grade enrollment (per 100 students)			.334**	.012	.312*
Mean parental school participation			1.684**	.587*	1.705**
Level of parental acquaintances			.019	.0002	.007
School mean SES				4.983**	—
(1) x parental acquaintances					.008
(2) x parental acquaintances					.104*
Student-Level Equation					
Intercept	45.083**	45.089**	45.086**	45.092**	45.086**
1988 mathematics achievement	.963**	.960**	.959**	.958**	.959**
SES	.755**	.770**	.769**	.765**	.768**
Stepfamily	-.579**	-.598**	-.592**	-.578**	-.593**
Single-mother family	-.240	-.244	-.247	-.228	-.247
Single-father family	-.963**	-.981**	-.970**	-.958**	-.966**
Guardian family	-1.663**	-1.680**	-1.691**	-1.718**	-1.697**
Knew many other parents	-.139	-.147	-.144	-.140	-.142
Discuss school matters	.346**	.346**	.349**	.351**	.350**
School participation	-.034	-.041	-.045	-.041	-.047
Asian	.865**	.872**	.851**	.809**	.850**
Hispanic	-.762**	-.817**	-.807**	-.836**	-.807**
Black	-.885**	-1.015**	-.992	-1.022**	-.991**
Male	.163	.157	.159	.154	.162

* $p < .05$, ** $p < .01$.

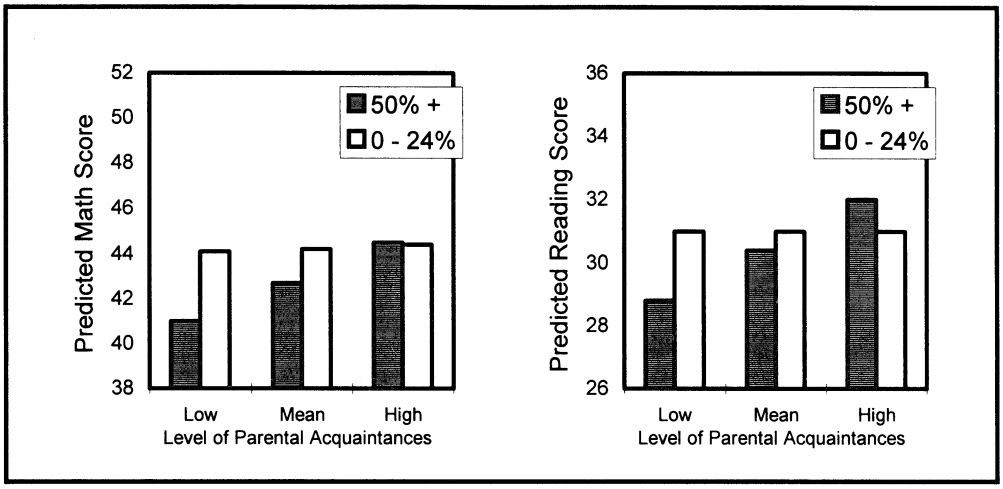
school participation. The estimates reported for Model 3 indicate that high 10th-grade enrollment and low parental school participation negatively affect 10th-grade mathematics achievement. Once these disadvantageous factors are controlled alongside the minority and economic status of the school, there is nothing particularly deleterious about the learning environments per se of schools in which 25–49 percent of the students are from single-parent families, compared to those with lower percentages of students from single-parent families. The fact that schools with 25–49 percent of children from single-parent families are less effective in producing mathematics achievement than are schools with lower proportions of such children can be explained by their minority and lower economic statuses, as well as the lack of parental participation.

However, the estimates in Model 3 indicate a significant negative coefficient remaining for schools in which 50 percent or more of the children are from single-parent families. One possible explanation for this school-level effect of family composition is that because the SES measures, based on the administrator's report of free school lunches and school sector, are imperfect measures of a school's SES, the school-level effect of single parenthood may proxy a school's unmeasured SES. To examine this possibility, I replaced the SES indicators of free school lunch and private school by the variable school mean SES. The analysis for Model 4 shows that results based on information from students are consistent with results based on the administrator's report: The academic difference between schools with 50 percent or more students from single-parent families and those with lower concentrations of such students remains.

A further analysis revealed a small but significant statistical interaction between a school's concentration of children from single-parent families and the level of parental acquaintances (see Model 5, Table 3). This significant interaction suggests that parents' acquaintances could compensate for the detriment of being in a school with a high concentration of children from single-parent families. Figure 1 illustrates this relationship by showing the predicted school mathematics and reading scores for various levels of parental acquaintances. When the level of parental acquaintances is low—defined as one standard deviation below the mean level—schools with high concentrations of students from single-parent families fall behind other schools in mathematics achievement. However, in a community with a high level of parental social relations—defined as one standard deviation above the mean level—even schools with a high concentration of single-parent families can produce equally high mathematics achievement as can schools in which children from two-parent families predominate.

The HLM results of reading achievement in Table 4 tend to substantiate those reported in Table 3 for mathematics achievement. That is, single parenthood has a similar negative contextual effect on reading achievement (Model 1, Table 4). Again, the effect is nonlinear: It is greater for a high concentration of single parents (-2.355) than for a medium concentration (-4.740). The negative contextual effect drops when the school's economic status is controlled (Model 2). Note that Catholic school has a positive effect, net of school mean SES, on reading achievement but not on mathematics achievement.

When measures of school-based social capital are added to the model (Model 3), the difference in reading



Note: A "low" level of parental acquaintances is defined as 1 standard deviation below the mean level, and a high level as 1 standard deviation above the mean. In each figure, the minimum and maximum values on the Y-axis represent 1 standard deviation of achievement scores for mathematics and reading, controlling for other variables in Model 5.

Figure 1. Predicted Math and Reading Scores, by Level of Parental Acquaintances and Concentration of Single-Parent Families

achievement between schools with 25-49 percent of students from single-parent families and schools with lower concentrations of such students disappears. Differences between Catholic and public schools also disappear. This finding is consistent with Coleman and Hoffer's (1987) view that part of the advantage of Catholic schools over public schools is due to the greater stock of social capital. However, schools in which more than half the students are from single-parent families are still a deleterious context for learning (Models 3 and 4).

Finally, Model 5 again shows a positive interaction between a high concentration of children from single-parent families and parental acquaintances and is graphically presented in Figure 1. In a school community in which the level of parental social relations is low—in which parents know few of their children's schoolmates—and there is a high concentration of single-parent families, reading achievement is depressed. However, the reading disadvantage of being in a school with a high concentration of single-parent families may be completely compensated for by parents' acquaintenship with many other parents.

It is apparent, in the analyses of mathematics and reading achievement in Tables 3 and 4, that student-level variables are stable across all four models. As one would expect, family background characteristics significantly predict 10th-grade achievement. Students of higher SES from two-parent families and whose parents often discuss school matters with them have higher levels of achievement than do other students. Once other family background factors are controlled, however, there is no evidence that living in *single-mother* families negatively affects children's achievement. Nevertheless, children from other types of one-parent families continue to fall behind children living with both par-

Table 4. Estimates from Multivariate (HLM) Analyses of 10th-Grade Reading Achievement, NELS:88 (N = 10,399 students from 654 schools)

	1990 Reading Achievements				
Predictor Variable	Model 1	Model 2	Model 3	Model 4	Model 5
School-Level Equation					
25–49 percent from single-parent homes (1)	-1.726**	-.686*	-.483	-.261	-.917
50 percent or more from single-parent homes (2)	-2.947**	-1.317**	-1.192**	-1.016**	-3.745**
Percentage free school lunch		-.068**	-.053**	—	-.053**
High concentration of minority students		-1.627**	-2.137**	-.905**	-2.056**
Private school		5.841**	4.049**	—	4.002**
Catholic school		1.642*	.481	-.447	-.419
Urban			-.065	.577	-.001
Rural			-.833	.267	-.834*
10th-grade enrollment (per 100 students)			.147	-.095	.127
Mean parental school participation			1.138**	.409*	1.160**
Level of parental acquaintances			.014	.0001	.001
School mean SES				3.327**	—
(1) x parental acquaintances					.012
(2) x parental acquaintances					.099**
Student-Level Equation					
Intercept	31.439**	31.554**	31.551**	31.548**	31.551**
1988 mathematics achievement	.854**	.853**	.853**	.853**	.853**
SES	.681**	.694**	.693**	.692**	.693**
Stepfamily	-.175	-.179	-.177	-.173	-.177
Single-mother family	-.303	-.294	-.292	-.283	-.291
Single-father family	-.792*	-.800*	-.793*	-.780*	-.790*
Guardian family	-.781*	-.790**	-.786*	-.799*	-.788*
Knew many other parents	-.181	-.179*	-.179	-.167	-.178
Discuss school matters	.274**	.278**	.280**	.278**	.280**
School participation	.114	.113	.111	.114	.11
Asian	.600*	.613*	.611*	.606*	.611*
Hispanic	-.536*	-.548*	-.543*	-.554*	-.544*
Black	-.880**	-.938*	-.932**	-.953**	-.931**
Male	-.321**	-.321**	-.318**	-.318**	-.318**

* $p < .05$, ** $p < .01$.

ents. Although significant effects of parental school participation and parental acquaintances were found at the school level, no such effect was found at the student level. Both mathematics and reading achievement are associated with ethnicity and gender groups. When other individual background factors are controlled, Asian students do better than the majority white students, while black and Hispanic students do worse in both mathematics and reading. Girls outperform boys in reading, but there is no evidence that boys have an advantage over girls in mathematics.

DISCUSSION

The NELS data, reported in this study, suggest that the proportion of a school's students living in single-parent families forms part of that school's compositional effect on children's learning. Furthermore, this effect is mediated by school-based social capital, as well as economic resources.

The analyses reported here confirm that the lack of economic resources is one reason why schools with greater concentrations of children from single-parent families are less effective than are schools with lower concentrations. After indicators of economic resources are controlled, additional indicators of social capital further reduce the detrimental impact of attending schools in which there are high concentrations of single-parent families. Together, both the schools' economic status and social capital (in the form of parental involvement) completely explained the differences in mathematics or reading achievement between schools with low concentrations of students from single-parent families and schools with medium concentrations.

However, although the school-level variables (minority status, SES, and parental relations) substantially reduced the negative influence of a high concentration of students from single-parent families, an effect still remained. It is likely that when students from single-parent families are the majority population in a school, the school's economic and interpersonal resources are so low that the school fails to attract good teachers and other school personnel. Thus, further studies should investigate teachers', adminstrators', and counselors' characteristics and other explanations for the remaining school compositional effect of family structure.

Corroborating research on eighth-grade achievement by Ho and Willms (1996), my study found that a *school-level* measure of parental school participation has a positive effect on students' achievement. However, my study did not find effects of *individual* parents' school participation on 10th-grade achievement. It may be that parents' school participation is important to 10th graders only in a context in which other parents also participate. In schools in which few parents attend school meetings or volunteer for school responsibilities, there is no evidence that the involvement of one parent in school makes a difference for his or her children. On the other hand, even children whose own parents do *not* participate in school can benefit from studying in an environment in which many other children's parents are active participants.

How can the relationship between a school's parental participation and student achievement be understood? Although it is conceivable that high participation is a result exclusively of parents' prior values and resources, it may also be the outcome of teachers' conscious efforts to promote

involvement without making single parents feel overburdened (Epstein 1990). In either case, most teachers and principals see the benefit of participation: Parents understand the school curriculum so they can reinforce the school's objectives at home. Although schools with increased parental involvement may be more conflictive or divisive, the results presented here demonstrate that, on balance, the effects of participation are positive.

Consistent with the findings about parents' school participation, a parent's acquaintance with other parents does not significantly predict achievement at the individual-level. However, for children attending schools with high concentrations of children from single-parent families, parental acquaintances *are* consequential for students' achievement. For all children attending schools in which more than half the student body resides with single parents, the number of mutual parental acquaintances positively affects mathematics and reading achievement. Intuitively, parental social relations are particularly important for single parents, who have less time to participate in school meetings, events, and parent-teacher organizations.

Therefore, it is critical for single parents to maintain contact with other parents who participate in school. These contacts create channels of information about school policies and personnel, as well as children's peers. Through exchanges with other parents, single parents also gain ideas about parenting practices and strategies that may enhance their own parenting. When single parents are busy, parents of their children's friends often serve as surrogate parents.

Clearly, single parents who are too busy to participate directly in their children's schooling will have little time to become acquainted with the parents of their children's friends. As was seen in Table 2, the level of parental acquaintances is lower in schools with higher concentrations of children from single-parent families. Nevertheless, in the NELS school sample, 5 of the 51 schools with high concentrations of students from single-parent families were schools in which half or more of the students reported that their parents knew many of the parents of their friends. From this finding. it should be concluded that building parental social relations, even in schools in which children from single-parent families predominate, is far from an impossible goal. From the perspective of administration and educational policy, the challenge, then, is to create strategies to bring parents together into communities. Schools that encourage parental networking through newsletters, evening social events away from school, or even explicit pairing of new parents with established families will help to build intraparental relations. In the process, the overall achievement of students will be enhanced.

NOTES

1. I extracted a longitudinal cohort of 18,393 10th graders from the public-released NELS First Follow-up student file. Among these students, 249 were physically handicapped students, 278 were American Indians, 1,627 had missing information on family structure, and 700 had missing scores on the mathematics or reading tests. I excluded American Indians from my sample because they are not one of the ethnic groups purposely sampled in NELS; thus, the few American Indians found in NELS are unlikely to be representative of the group.

2. Before any sample restriction

was imposed, the figures were 17 percent for single-mother families, 3 percent for single-father families, 13 percent for stepfamilies, and 4 percent for guardian families. Therefore, the sample restrictions resulted in 5 percent fewer children from single-parent families. It is not clear whether this 5 percent loss contributed to bias in the statistical estimates.

3. In the baseline model, prior achievement had an estimated parameter variance that was found to be significant for both mathematics and reading achievement, which suggests the heterogeneity of prior achievement among schools. Other student-level variables were found to be fixed. In subsequent analyses, the intercept of the student-level equation (B_{j0}) is treated as an outcome that is allowed to vary across schools. After centering, B_{j0} becomes the school average achievement adjusted for compositional differences. The school-level coefficients represent the "type A" effect (Raudenbush and Willms 1995; Willms and Raudenbush 1989), in which the school's effectiveness may derive from various sources, including school policies and practices, as well as inputs from student composition and other contextual influences.

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The research on which this article was based was supported by a grant from the American Educational Research Association (AERA), which receives funds for its AERA Grants Program from the National Science Foundation and the National Center for Education Statistics, U.S. Department of Education, under NSF Grant RED-9255347. Partial support was provided by the Population Research Institute, Pennsylvania State University, which has core support from the National Institute of Child Health and Human Development (Grant 1-HD28263-01). Opinions expressed in this article are the author's and do not

necessarily reflect those of the granting agencies. An earlier version of this article was presented at the AERA meeting, Chicago, March 1997. The author wishes to thank Karl Alexander, Aaron Pallas, David Post, and Barbara Schneider for their useful comments and the Statistical Core of the Population Research Institute, Pennsylvania State University, particularly Annie Qu, for statistical advice. *Address all correspondence to Dr. Suet-ling Pong, Department of Education Policy Studies, Pennsylvania State University, 319 Rackley Building, University Park, PA 16802, or by E-mail at pong@pop.psu.edu.*