CHAPTER II

REVIEW OF LITERATURE

This chapter begins with a brief description of the legal context surrounding class- and race-based student assignment policies. Student assignment policies must comply with federal and state law, regardless of the criteria on which they are based. Recent changes in judicial attitudes toward race-based student assignment policies highlight the particular relevance for this study of the legal context pertaining to school districts' student assignment decisions.

This chapter also contains a review of the existing research literature regarding the relationships between student academic achievement and various student and school demographic characteristics. Particular attention is paid to the effects on student achievement of student race and social class, at both the individual and aggregate levels. Other demographic characteristics that appear to be related to student achievement are discussed as well, including student sex and English proficiency, school size and urbanicity, and class size.

Legal Context

For school districts such as San Francisco or Wake County, North Carolina, that wish to implement non-race-based student assignment policies,

one of the most important aspects of class-based policies is that they are legal. Despite a long history of implementation in the United States, race-based student assignment plans are increasingly being viewed with skepticism by our nation's courts. This judicial movement away from race-based student desegregation policies is part of a larger trend in which federal courts are more closely scrutinizing all governmental policies based wholly or partly on race. The end result has been that race-based policies often are invalidated by our nation's judiciary (Hopwood v. Texas, 1996; Adarand Constructors, 1995).

This judicial inclination stands in stark contrast to events of the past few decades. Following the landmark decision of Brown v. Board of Education of Topeka (1954), in which the Supreme Court of the United States (Supreme Court) held that intentional racial segregation in schools was illegal, American courts paid great attention to desegregation issues related to student racial or ethnic status. Many school districts, especially in large urban areas, were forced by courts to focus on racial imbalances that existed between schools. Compensatory measures, such as busing or magnet schools, that were instituted by districts to remedy such imbalances were routinely upheld by federal courts as valid mechanisms of remedying past racial discrimination (see, e.g., Swann v. Charlotte-Mecklenburg Board of Education, 1971; Davis v. East Baton Rouge School Board, 1983).

In the early 1990s, however, federal courts began to terminate their

supervision of school district desegregation plans. Stating that court-mandated desegregation plans were supposed to be temporary measures (Board of Education of Oklahoma City Public Schools v. Dowell, 1991) and that "federal supervision of local schools was not intended to operate in perpetuity" (Dayton, 1993), federal courts began to declare that a number of school districts had achieved "unitary" status and thus were free from further judicial oversight.[1] Among the many school districts declared by the courts to be unitary were such major urban districts as Denver, Colorado; Kansas City, Kansas; Cincinnati and Cleveland, Ohio; Buffalo, New York; Minneapolis, Minnesota; Clark County (Las Vegas), Nevada; Seattle, Washington; and Austin, Texas (Orfield & Yun, 1999; Weiler, 1998).

The recent willingness of courts to "release school districts from [judicial] supervision of their desegregation efforts" (Weiler, 1998) has concerned a number of commentators and researchers. As Gary Orfield, leader of the Harvard Project on School Desegregation, has noted, judicial declarations of unitary status leave school districts free to implement measures that have "the effect of creating unequal opportunities for minority students unless civil rights lawyers

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[1]A school district can achieve unitary status if it eliminates the vestiges of past racial discrimination that existed in the district, especially in the areas of student assignments, faculty, staff, transportation, extracurricular activities, and facilities (Green v. County School Board, 1968; Dayton, 1993). Moreover, a school district need not achieve unitary status in all six of these areas in order to be released from judicial supervision but instead can desegregate incrementally (Weiler, 1998; Freeman v. Pitts, 1992). School districts also need not show "measurable gains for the student subjected to a history of discrimination" (Orfield & Yun, 1999) before being released from judicial oversight (Missouri v. Jenkins II, 1995).

[can] prove that [districts] intended to discriminate, a standard that is virtually impossible to meet" (Orfield & Yun, 1999). Wells & Crain (1997) have concurred, noting that "court-ordered school desegregation policy is a legal anomaly: once the constitutional violator [i.e., the school district] has proved that it has suspended the practice of creating racially identifiable schools for several years, it is then free to re-create racially segregated schools" (pp. 335-336). Yet despite the concern by educational researchers, decisions by school districts to discontinue race-based student assignment plans are almost certain to survive judicial scrutiny, even when the resultant effect is increased racial segregation of students. As the Supreme Court said in Freeman v. Pitts, "resegregation [that] is a product not of state action but of private choices [such as residential preferences] . . . does not have constitutional implications" (Freeman v. Pitts, 1992, p. 495).

In addition to the federal judiciary's growing indifference regarding the impacts of eliminating race-based student assignment plans, it also is likely that many members of the public will be unconcerned about those impacts as well. A Gallup Poll conducted in July 1999 found that while 68% of Americans agreed that "integration programs in general have helped improve the quality of education for [African-American] students, . . . the vast majority would prefer to accomplish school integration through methods other than busing" (Gillespie, 1999), such as increased funding and resources for minority-dominated

neighborhood schools. Weiler (1998) has noted that "community members, parents, and educators often support a return to neighborhood schools because they believe desegregation is costly, that it has not accomplished what it was intended to do many years ago, and that it has resulted in meager improvements." This is true even for minority parents, many of whom have "lost confidence in the ability of their child's desegregated school to provide an equitable education" (Weiler, 1998).

These judicial and societal trends occur at a time when student racial segregation already is higher than it has been for several decades (Orfield et al., 1997). The percentage of African-American students in majority White schools is the lowest it has been since the early 1970s, and the segregation of Hispanic students is probably worse than at the time Brown v. Board of Education of Topeka was decided (Orfield & Yun, 1999). These trends are especially significant given the increasing diversity of our nation's student population as a whole. United States Department of Census statistics indicate that during the period from 1940 to 1960 the proportion of non-White students in public schools was only about 12% of the total student population (Orfield & Yun, 1999). By 1996 that proportion had reached 36% and it has been projected that by the year 2050 that figure will be 58% (Orfield & Yun, 1999). Five states[2] already exist in which "the majority of all public school students are from 'minority' backgrounds"

[2]California, Hawaii, Mississippi, New Mexico, and Texas.

(Orfield & Yun, 1999); more are certain to follow in the years to come.

Discontinuation of race-based student assignment plans will only hasten the resegregation of our nation's schools, and many fear a return to "an educational pattern that has never in the nation's history produced equal and successful schools" (Orfield & Yun, 1999). Thus it is not too surprising that in the current judicial and societal climate many school districts are struggling to find ways to retain what they believe are the benefits that accompany the presence of diverse populations within their schools. Some school districts, such as San Francisco and Wake County, are turning to class-based student assignment plans as a means of benefiting students without running afoul of judicial dispositions against race-based measures.

In contrast to their race-based counterparts, class-based student assignment plans may be "legally unassailable" (Taylor, 1991). Social class, unlike race, is not considered to be a suspect classification under the Constitution of the United States and thus the Supreme Court "is almost sure to uphold the constitutionality" of class-based student assignment plans (Kahlenberg, 1996, p. 107). Indeed, several of the Justices on the Supreme Court "have gone out of their way to explicitly advocate forms of class-based [preference] as a constitutional alternative to race-based programs" (Kahlenberg, 1996, p. 109). The legal reasons favoring the implementation of class-based student assignment plans thus appear powerful; however, it remains unclear

whether the educational reasons for doing so are as strong.

Educational Research

School districts could decide to implement class-based student assignment plans for several reasons. For example, they may genuinely wish to equalize student academic opportunity based on socioeconomic status (SES), or they may wish to maintain the perceived benefits of race-based plans while simultaneously avoiding legal challenge.[3] However, if research indicates that class-based student assignment policies may be equally or more successful than race-based policies at raising student academic achievement, school districts would have an increased justification for incorporating class-based criteria into their student redistribution plans. This section summarizes the educational research literature that has investigated the relationships between race, SES, and student achievement. In addition to student race and social class, other student and school demographic characteristics that appear to be related to student achievement are discussed as well, including student sex and English proficiency, class size, school size, and school urbanicity.

Race and Socioeconomic Status

A vast number of research studies have been conducted for the purpose

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[3]School districts' use of class-based student assignment plans to avoid the legal infirmities of race-based plans may be troublesome. Roger Clegg, general counsel for the Center for Equal Opportunity, has stated that such practices are "every bit as illegal as using explicitly racial characteristics in order to achieve racial balancing. [School districts] can't use ostensibly neutral criteria if [their] aim is to achieve a racial end" (Tolin, 1999).

of investigating the potential impacts of race and SES on student academic achievement. The Coleman Report of 1966 (Coleman et al., 1966) is the most well-known, and perhaps the most comprehensive, of these studies.

Coleman et al. surveyed 580,000 students in over 3,000 schools in an attempt to assess "whether schools provided equal educational opportunity to all students regardless of racial and socioeconomic backgrounds" (Farmer, 1998, p. 1). After analyzing a multitude of student and school characteristics, Coleman et al. famously concluded that between-school differences accounted for only a minute portion of differences in student achievement after controlling for students' socioeconomic background. Because deviations in facilities, curricula, and teacher quality among schools accounted for only a small portion of differential student achievement, Coleman et al. thus argued that any differences in school achievement that did exist were primarily a result of compositional differences rather than contextual differences.

The findings of the Coleman Report were affirmed by Jencks et al. (1972). In a re-analysis of the data in the Coleman Report, Jencks et al. also found that "children [were] far more influenced by what happens at home than by what happens in school" (p. 255). Jencks et al. additionally noted that "even when a school [did exert] an unusual influence on children, the resulting changes [were] not likely to persist into adulthood" (pp. 255-56).

The initial effect of the Coleman Report was to draw out a few detractors

who were quick to criticize Coleman et al. and Jencks et al. For example, some researchers (e.g., Smith, 1972) noted that the measures used to represent school resources were inadequate and that the Coleman Report confused the presence of school resources with the utilization of those resources. Other critics (e.g., Armor, 1972) felt that the cross-sectional survey design used in the Coleman Report should have been a longitudinal one instead. Others noted that the statistical and methodological errors in the report were likely to have resulted in an underestimation of the size of school effects (Cain & Watts, 1970; Bowles & Levin, 1968).[4] These initial criticisms were primarily methodological in nature and had a small impact at the time. Later responses to the Coleman Report, however, focused more on substantive issues and were more monumental in their effect.

In the twenty years following the Coleman Report, so many educational researchers initiated studies for purposes of attempting to refute the report's findings that an entire body of research literature, entitled "effective schools" research, was created.[5] As Lee & Bryk (1989) have noted, effective schools research "attempted to identify the characteristics of schools that make them instructionally effective for disadvantaged students" (p. 173). This generally was done by identifying "schools that [were] particularly effective for [low SES]

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[4]Interestingly, later reanalyses by Coleman (1972) resulted in larger estimates of school effects, but these results were "generally ignored" (Payne & Biddle, 1999, p. 5).

[5]A few research studies since the Coleman Report have confirmed its findings. For example, research by Anderson & Dorsett (1981) also found that school resources contribute little to student learning beyond individual students' backgrounds.

children and then [isolating] the common characteristics that these schools share[d]" (Lee & Bryk, 1989, p. 173). While the effective schools literature endured its share of methodological and substantive criticisms (Lee & Bryk, 1989), certain factors were commonly identified as important ones for the educational success of economically disadvantaged students. These factors included "strong leadership focused on academic outcomes; close monitoring of students' work; positive expectations by teachers for all students; a purposeful social environment or 'ethos'; and an orderly climate" (Lee & Bryk, 1989, p. 173).

Effective schools research dominated much of the educational research related to student achievement from the 1970s to the early 1990s and focused on non-demographic factors related to student academic success. However, even during the peak of effective schools research, other investigations were pursued by researchers as well. Many researchers continued to explore student and school demographic factors and their relationship to student academic achievement; particular attention was paid to issues of race and socioeconomic status.

Race and Achievement

Much of the initial research concerning the relationships between racial / ethnic minority status and student achievement stemmed from the desire to examine the effects of desegregation. Thus most of the first wave of research in this area was conducted in the 1960s and 1970s. Examinations of the long-term

effects of racial desegregation began to appear in the late 1970s and 1980s. Then, in 1994, Herrnstein & Murray released their book, *The Bell Curve*, and a resurgence of interest was created in the relationships between race, intelligence, and achievement. Most of the recent research regarding minority student achievement has been in attempt to refute Herrnstein & Murray's central claims that minority underachievement is primarily a result of genetic causes.

School Racial Concentrations

The research literature on the effects of school racial concentrations on student academic achievement has been somewhat inconclusive. While Coleman et al. (1966), Jencks et al. (1972), and a few others have stated that schools make little difference in the efforts to achieve equality for minority students, many other researchers have found that African-American students have benefited from racial desegregation policies.

Several early research studies found results similar to Coleman et al. (1966) and Jencks et al. (1972). For example, in a review of five studies of Northern desegregation programs, including Boston's METCO program, Armor (1972) found that none of the studies could conclusively demonstrate that racial desegregation affected Black students' performance on standardized achievement tests. Crain & Mahard (1979) noted in a study of 23,000 students from the National Longitudinal Study of 1972 (NLS) that there was no difference between the test scores of Southern Black students in predominantly Black

schools and those in predominantly White schools. Similarly, a study of several thousand students in Indianapolis found that the "racial composition of grade school classes had no significant effect on . . . academic values, effort, grades, or achievement scores" (Patchen, Hofmann, & Brown, 1980, p. 40).

Two of the studies finding results similar to Coleman et al. (1966) and Jencks et al. (1972) also included contrary results, however. For instance, Crain & Mahard (1979) found that significant and positive differences in achievement (about three-eighths standard deviation (SD)) existed for Northern Black students in predominantly White schools, even with statistical controls for family background (Mayer & Jencks, 1989). Likewise, Patchen, Hofmann, & Brown (1980) noted that the racial composition of classes did have an impact on the achievement scores, grades, and effort of Black high school students. Armor's study had its own limitations: critics noted that the choice of studies for the review was highly selective and that use of other existing studies that met Armor's methodological criteria probably would have resulted in contrary findings.

In contrast to these few studies that at least partially affirmed the findings from the Coleman Report, a number of other early studies found school integration efforts to have positive effects. For instance, Crain (1971) found in a study of 1,600 Black adults that school integration resulted in improved educational achievement, decreased dropout rates, and increased college attendance by Black students. McPartland (1969) and Bridge, Judd, & Moock

(1978) also found that the placement of Black students in majority White schools resulted in increased Black test performance. Brookover et al. (1978) concurred, finding that school racial composition was highly related to mean school achievement.[6] Bullock (1976) found that "children who attended a desegregated school . . . tended to view race more tolerantly than those who attended segregated schools" (Campbell, 1977, p. 81).

As two of the most famous reviews of the desegregation literature noted, conclusions from early research on desegregation were difficult because of methodological differences between studies (St. John, 1975; Weinberg, 1975). Yet even those reviews affirmed that White achievement levels were not lowered by desegregation and that Black achievement levels rarely were (and were usually raised). Later reviews of the desegregation literature were more consistent in their findings.

In a 1978 review of 73 desegregation studies, Crain & Mahard stated that "virtually every writer . . . has agreed that the test performance of White students is unaffected by school desegregation" (p. 18) and confirmed that Black achievement test performance generally was higher in predominantly White schools (see also Crain, Mahard, & Narot, 1982). In a subsequent meta-analysis of 93 research studies, they also noted that a 0.3 SD enhancement of Black achievement attributable to desegregation seemed "to occur only in the earliest

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[6]However, once the effects of school climate factors were removed, racial composition explained only a very small proportion of between-school variance (Brookover et al., 1978).

primary grades" (Crain & Mahard, 1983, p. 839) and found results for Hispanic students to be similar to those of Black students (see also Mahard & Crain, 1980; Coleman et al., 1966).

In another research summary, Braddock & McPartland (1988) noted that the "academic performance of Blacks and Whites [was] not harmed in desegregated schools and . . . [that] Blacks typically show[ed] achievement gains - especially in reading - as a result of school desegregation" (p. 6). These achievement gains were strongest when desegregation began "in the early grades, [was part of] a metropolitan-wide plan, and [took] place in predominantly White schools with a critical mass of Black students" (p. 6; see also Jencks & Phillips, 1998b; Phillips, 1997).

Only a few studies have examined the long-term effects of desegregation. In a review of 21 of "the most substantial studies on the long-term effects of school desegregation" (p. 698), Wells (1995) noted that desegregated African-American students had higher occupational aspirations and that African-American graduates of desegregated schools were more likely to attend desegregated colleges.[7] Wells (1995) also noted that "African-American [adults] who attended desegregated schools [were] more likely to be working in white-collar and professional jobs in the private sector and [that adults] from

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[7]This has important implications for the societal mobility of African-Americans because "predominantly White universities are considered the most prestigious and therefore the highest-status institutions" (Wells, 1995, p. 703).

segregated schools [were] more likely to be in government and blue-collar jobs" (p. 703). This latter result appeared to occur because Black students in predominantly White schools had "greater access to networks of sponsorship and job information which culminated in labor market advantages over their counterparts in Black schools" (Braddock & McPartland, 1988, p. 65).

Braddock & McPartland (1988) have noted that "cross-group contact is the mechanism that produces desegregation's major benefits for students" (p. 66); "cross-racial contacts in desegregated schools reduce . . . students' negative racial stereotypes and fears of hostile reactions in interracial settings" (p. 63; see also Bankston & Caldas, 1996; Hacker, 1995). Thus students who attend desegregated schools are more likely "to live in desegregated neighborhoods, to have children who [attend] desegregated schools, and to have close friends of the other race" than students who attend segregated schools (Braddock & McPartland, 1988, p. 8). Similarly, Black students "who attend desegregated schools are more likely to have desegregated social and professional networks in later life . . . and to find themselves in desegregated employment" (Wells, 1995, p. 703).

A few recent studies have affirmed the negative effects of higher school minority percentages on student academic achievement. A linear regression analysis of the achievement of 42,000 tenth-graders on the Louisiana Graduation Exit Examination (GEE) found that "students of all races who attended majority

minority schools performed less well than those who attended majority White schools" (National Education Association, 1999). These findings held even after controlling for socioeconomic status of the students' parents (Bankston & Caldas, 1996) and may contradict earlier findings that school minority concentration does not affect White student achievement (see, e.g., Crain & Mahard, 1978; Braddock & McPartland, 1988). In a study of 145 urban and rural schools in Missouri, Alspaugh (1992) found a negative correlation to exist between rural school minority concentration and reading achievement. In a study of 26,000 students from the 1980 High School and Beyond (HS&B) survey, Mayer (1991) noted that "students in predominantly Black [or Hispanic] schools are more likely to drop out" (p. 328).

Overall, it appears that "on a macro-level school desegregation has resulted in improvements in the academic performance of Black students" (National Education Association, 1999). Since the broad-scale implementation of school desegregation policies in the late 1960s, the test score gap between Black and White students "has decreased by nearly 50 percent - a phenomenon attributable to rising scores for Black students, not lower ones for Whites" (Wells & Crain, 1997, p. 340; Grissmer, 1996; Flynn, 1980). However, "research [also] has demonstrated that merely bringing Black and White students together in school does not necessarily raise Black student achievement or improve race relations" (Beady & Hansell, 1981, pp. 191-192; see also Gerard & Miller, 1975;

St. John, 1975; Stephan, 1978) and that "the potential effects of school desegregation on [Black] achievement can be offset by segregation within the school" (McPartland, 1969, p. 101). However, this risk may be relatively slight, since most students in racially mixed schools also are in racially mixed classroom instructional groups (Braddock & McPartland, 1988, p. 66).

Individual Student Race

In addition to the effects of school minority concentrations on student achievement, relationships also appear to exist between individual minority status and educational success. The causal factors behind this average "Black-White test score gap" (Jencks & Phillips, 1998a) have been hotly disputed.

A few researchers have postulated that racial differences are genetic in nature. These researchers have claimed that, for both individuals and for racial / ethnic groups, heredity explains more of the differences in persons' intelligence quotients (IQs) and achievement than does the environment in which they are raised and schooled (see Jensen, 1969; Herrnstein, 1971; Herrnstein & Murray, 1994). The most famous work supporting this hypothesis is *The Bell Curve*, a book by Herrnstein & Murray that caused a great deal of controversy when it was released in 1994. The essential hypothesis behind *The Bell Curve* was that intelligence is a biologically-inherited trait that can be summarized as a single linear score, such as IQ (Vanden Berk & Wodtke, 1999). This score, which Herrnstein & Murray (1994) called *g*, "differ[s] enough [between races] to account

for differences in intelligence" (Vanden Berk & Wodtke, 1999, p. 3). Thus the authors concluded that "social or educational interventions to improve group intelligence will have little or ephemeral effect" because "social inequality is the natural result of biological class fate" (Vanden Berk & Wodtke, 1999, p. 3).

Other researchers have countered Herrnstein & Murray's claims with evidence that genetic causes are insufficient to explain any intelligence or test score gap that exists between African-Americans and Whites. Jencks & Phillips (1998b) have stated that, "despite endless speculation, no one has found genetic evidence that Blacks have less innate intellectual ability than Whites" (p. 2). Vanden Berk & Wodtke (1999) have noted that the gap would not have closed over the past few decades if average racial differences in IQ and achievement test scores are a result of genetic differences. Many researchers have documented this closing of the test score gap between Blacks and Whites, including Flynn (1980), who discovered average IQ gains by Blacks of 25 points on "the least culturally-loaded test . . . over one generation in twenty countries" (Vanden Berk & Wodtke, 1999).[8] Similarly, Hauser & Huang (1996) noted that differences between Blacks' and Whites' cognitive tests have been reduced for individuals born after the mid-1960s and that, by the mid- to late 1980s, "initial test score differences in reading were reduced by 50%, those in mathematics [by] 25 to 40%, and those in science [by] 15 to 25%" (p. 47), even while IQ

[8]This closing of the Black-White test score gap has been labeled "the Flynn effect."

scores for Whites have risen overall (Flynn, 1984; Neisser, 1998; Flynn, 1987). Jencks & Phillips (1998b) have noted other difficulties with genetic explanations, including evidence that IQ scores are sensitive to environmental changes and the fact that "when Black or mixed-race children are raised in White rather than Black homes, their preadolescent test scores rise dramatically" (p. 3; Moore, 1986).

Some researchers have found test score differences that exist between Blacks and Whites to be a result of socioeconomic, rather than genetic, factors (see, e.g., Nisbett, 1998). For example, a study of dropouts in a large, racially-diverse California high school found that race had little impact on dropout rates once SES was held constant (Rumberger, Ghatak, Poulos, Ritter, & Dornbusch, 1990) and Brooks-Gunn, Duncan, & Maritato (1997) noted that differences in frequency of poverty and the average length of time in poverty account for more than half of the difference between Black and White children's IQ scores. Likewise, Wilson (1998) has noted that while

> conventional measures of SES . . . capture only a small component of a child's total family environment, . . . roughly a third of the Black-White IQ gap, ... [broader indices of children's family environments explain] more than half the gap. The more measures of family environment [that are controlled], the narrower the Black-White IQ gap becomes. This suggests . . . that measures of Black-White family background differences are not only incomplete but probably underestimate the importance of such differences. (p. 505; see also Phillips, Brooks-Gunn, Duncan, Klebanov, & Crane, 1998)

Others have found, however, that socioeconomic factors are insufficient to explain any existing gap. In a longitudinal study of almost 40,000 students that

used a hierarchical linear model to control for the effects of family SES, Puma et al. (1997) found that student race and ethnicity was strongly related to student achievement on the Comprehensive Test of Basic Skills, Fourth Edition (CTBS/4). Similarly, in a meta-analysis of eight large-scale assessments of student achievement,[9] Phillips, Crouse, & Ralph (1998) found that traditional SES differences explained some of the Black-White test score gap in elementary and middle school but none of the gap in high school (p. 256). Indeed, "Black children [scored] about 0.02 SD less in math, 0.06 SD less in reading, and 0.05 SD less in vocabulary each year . . . even when Black and White children [had] the same prior scores, the same measures of SES, and attend[ed] the same schools" (Phillips, Crouse, & Ralph, 1998, p. 256).

Thus it appears that neither genetic nor socioeconomic factors alone are sufficient to explain the Black-White test score gap. Other explanations for lower Black scores have included test bias (Jencks, 1998),[10] lower teacher expectations for Black students (Ferguson, 1998), Black students' fear of "acting White" (see, e.g., Fordham & Ogbu, 1986), and the problem of "stereotype threat" (Steele, 1997; Steele & Aronson, 1998). Regardless of the causes, it

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[9]Equality of Educational Opportunity (1965), National Longitudinal Survey of Youth (NLSY) (1980), High School and Beyond (HS&B) (1980), Longitudinal Study of American Youth (LSAY) (1987), Children of the National Longitudinal Survey of Youth (CNLSY) (1992), National Education Longitudinal Study (NELS) (1988, 1990 1992), Prospects (1991), and the National Assessment of Educational Progress (NAEP) (1971-96).

[10]Test bias can take several forms, including labeling bias, content bias, methodological bias, prediction bias, and selection system bias (Jencks, 1998).

appears that a test score gap exists. As Jencks & Phillips (1998b) have noted, "the typical American Black still scores below 75% of American Whites on most standardized tests [and] on some tests scores below more than 85% of Whites" (p. 1). Moreover, there is evidence that the gains by Blacks over the past few decades are eroding (Hauser & Huang, 1996). As a result, researchers conducting research pertaining to student achievement should continue to include student race in their list of factors to be studied.

Socioeconomic Status and Achievement

While a great number of studies have examined the effects of individuals' race and/or the racial composition of schools on student achievement, comparatively fewer have been conducted in regard to the effects of student and school SES on student achievement (Biddle, 1997). Compounding this relative dearth of research has been some confusion in the research community about what constitutes individual and family SES.

In the past, researchers have defined SES in a number of different ways. Indicators used in research studies include family income, parents' occupation(s), parental educational attainment, size of family, ethnicity, mobility, educational aspirations, presence of reading materials in the home, quality of housing, status of dwelling area, and the amount of travel (White, 1982). Unsurprisingly, "the way in which SES is defined is of critical importance in determining the strength of the relation[ship] between SES and academic achievement" (White, 1982, p. 474).

White (1982) noted that family income is the "highest single correlate of academic achievement" (p. 470), but the National Center for Educational Statistics (1997) has stated that "independent of income, . . . parents' level of education [can] influence the value that parents place on education, which in turn can influence their children's educational attainment" (p. 10). Most researchers today would agree that the best indicator of SES is one that combines family income, parents' occupation(s), and parental educational attainment (Kahlenberg, 1996; Matuszek & Haskin, 1978).

Several commentators have remarked on the paucity of research in regard to student and school SES and academic achievement. For example, Biddle (1997) has stated that,

> given the seriousness of the poverty problem, one might assume that a host of good studies investigating the effects of child poverty on achievement would have appeared. Actually, such studies are hard to find. Part of the difficulty seems to be that good data on the poverty of individual students or their families are not often gathered in America. Thus studies of poverty effects in schools must usually make do with indirect indicators, such as students' eligibility for free or reduced-price lunches . . . . [and] many of these studies have not involved statistical controls. The time is surely ripe for better research on the achievement effects of . . . child poverty in America. (p. 11)

Some research does exist on SES and achievement, of course, and most researchers have found relationships to exist between SES and achievement. However, disagreements about the strengths of those relationships are not uncommon.

Individual Student Socioeconomic Status

A number of studies have found relationships to exist between individual student SES and educational success. Anderson, Hollinger, & Conaty (1993) noted that results from the National Assessment of Educational Progress (NAEP) routinely indicate lower achievement in core subjects for disadvantaged students. Similarly, Hodgkinson (1995) stated that results from the National Education Longitudinal Study (NELS) show "that the wealthiest one-fourth of White, Black, Hispanic, and Asian eighth-graders do at least twice as well in math as the poorest quarter of their racial / ethnic group - and sometimes three or four times as well" (p. 178). These effects cut across racial / ethnic lines as well. For example, affluent Black children do better at math than do disadvantaged Asian children (Hodgkinson, 1995, p. 178). In the *Prospects* study of nearly 40,000 Chapter I students, Puma et al. (1997) found that family income and SES [a composite measure of parental education and occupation] were consistently, and positively, related to student achievement. A study of 1994 mathematical instructional practices and curricula and California Learning Assessment System (CLAS) outcomes noted that "student social status is still the foremost predictor of school performance" (Hill, Cohen, & Moffitt, 1999, p. 61). The Children's Defense Fund (1998) has stated that poor children exhibit lower achievement and are more likely to be retained in grade and less likely to attend college than more affluent peers. Other studies have affirmed these results (see, e.g., Cohen

& Hill, 1998; Coleman et al., 1966; Bridge, Judd, & Moock, 1979; Guskey & Kifer, 1990; Mandeville & Anderson, 1987; Bulach, 1995).

Yet while researchers generally have agreed that individual student SES is related to academic achievement, disagreements about the strength of those relationships abound. Some studies have found the relationships between student SES and achievement to be quite strong. Using data from the National Longitudinal Survey of Youth (NLSY) Child Supplement and the Infant Health and Development Program (IHDP), Brooks-Gunn, Duncan, & Maritato (1997) found that, after "controlling for other family characteristics, [the effects of income] on intelligence and verbal test scores [in early childhood were] quite large - about one-third of a standard deviation" (p. 10). Similarly, Smith, Brooks-Gunn, & Klebanov (1997) found that children who lived in persistently poor families scored six to nine points lower on verbal ability, IQ, and achievement tests than did children who had never experienced poverty. Puma & Drury (2000) have concurred, stating that poverty at the individual student level is "strongly associated with decreased school performance" (p. 1; see also Coleman et al., 1966).

In contrast, however, other researchers have found the relationships between individual SES and achievement to be much weaker. An early assessment of Title I noted that the association of family poverty with students' educational achievement was not particularly strong (National Institute of

Education, 1977; Wolf, 1977). Likewise, in a meta-analysis of 101 studies of SES and academic achievement, White (1982) found only a modest relationship (r = .22) between low SES and individual student achievement. White's results were similar to those found in a study of 10,000 students in public and Catholic schools (Raudenbush & Bryk, 1986). Using a hierarchical linear modeling (HLM) analysis, Raudenbush & Bryk (1986) found that the correlation between student SES and mathematics achievement was approximately .20. Two studies of high school students also have found weak correlations between SES and achievement (McCartin & Meyer, 1986; Hennessey & Merrifield, 1978).

Some researchers have noted that the effects of individual student SES on achievement may not be consistent. For example, the effect of family SES on achievement may be greater for younger children than for older children (Entwisle, Alexander, & Olson, 1997) and may be greater for students in extreme poverty than for students in near poverty (Smith, Brooks-Gunn, & Klebanov, 1997). Also, Entwistle, Alexander, & Olson (1997) have stated that differences in achievement for disadvantaged children may be due to seasonal learning differences: "poor children's cognitive growth . . . virtually ceases when schools are not in session" because they are not exposed to "the resources they need to grow outside school, especially in summer" (pp. 32-33). Low SES students, who make equal progress during the school year (Entwisle et al., 1997, p. 57), may only fall behind more advantaged peers during the times when school is closed.

Disagreement thus exists in regard to the strength of the relationships between family SES and individual student achievement. In contrast, however, most studies have found much stronger relationships to exist at the school level.

School Socioeconomic Status

Although the authors of the Coleman Report generally found that school characteristics had little effect on test performance, they did find that lower SES students were likely to exhibit increased academic achievement when exposed to higher SES student peers (Coleman et al., 1966, p. 22). Subsequent studies have underscored the importance of school-level SES for students' achievement.

In 1989, Mayer & Jencks noted that attending high SES elementary schools may raise children's test scores and that attending affluent high schools may increase students' chances of graduating (see Bryk & Driscoll, 1988). Similarly, a study of 10th-grade students in the HS&B study found that students attending high SES schools were less likely to drop out than those of the same race and SES attending low SES schools (Mayer, 1991, p. 327).

In a study of 145 elementary schools in Missouri, Alspaugh (1992) found that the best predictor of reading achievement was a school's percentage of students receiving free or reduced price lunch. The *Prospects* study of Chapter I students concurred, finding that "school poverty [depressed] the scores of all students in schools where at least half the students are eligible for subsidized lunch" (Puma et al., 1997, p. 12; see also Flaxman, Schwartz, Weiler, & Lahey,

1998; United States Department of Education, 1993). A series of four studies of school districts in Minnesota also found that "the degree to which poor children [were] surrounded by other poor children . . . [had] as strong an effect on their achievement as their own poverty" (Schellenberg, 1999, p. 130).

A study of 19,000 NELS eighth-graders found that school SES had the greatest impact on achievement in schools with very high poverty concentrations (i.e., those in which the percentage of students receiving free or reduced price lunch was above 50%) (Anderson et al., 1993). These results confirmed those from an earlier study, an assessment of Title I that found that schools with high percentages of low SES students were far more likely to have lower mean achievement scores than other schools (National Institute of Education, 1977; Wolf, 1977; see also White, 1982; Puma et al., 1997).[11] In a study of 20,000 students in Milwaukee and its surrounding suburban school districts, Walsh (1986) found the relationship between academic achievement and school SES to be curvilinear and that school SES explained more than half of the variation in academic achievement. However, in contrast to Anderson, Hollinger, & Conaty (1993), Walsh found that negative effects on achievement increased little once school poverty concentrations rose above 25% or so.[12]

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[11]Similar results have been found for data aggregated at the school district level (see Payne & Biddle, 1999).

[12]Walsh's work was a reanalysis of an earlier study by Walsh & Witte (1985) that had found a correlation of .70 between mean scores on the Iowa Test of Basic Skills (ITBS) and school poverty concentrations.

These robust relationships between school-level SES and academic achievement are at least partly due to the effects of aggregation. As White (1982) has noted, "correlations computed from aggregated data [almost always] will be much higher than correlations computed using individuals as the unit of analysis" (p. 467; see also Robinson, 1950). School-level correlations between SES and academic achievement found by some researchers to range from .67 (Walsh & Witte, 1985) to .80 (Klein, 1971) thus contrast sharply with individual-level correlations found by others to range from .19 (McCartin & Meyer, 1986) to .36 (Wright & Bean, 1974), and great care must be taken when surveying the literature on SES and academic achievement because researchers' language often can be misleading.[13] A reanalysis of the data from the Milwaukee study (i.e., Walsh & Witte, 1985; Walsh, 1986) further underscores this point: by using individual student data [and substituting eligibility for free or reduced price lunch for the broader category of eligibility for Chapter I], White, Reynolds, Thomas, & Gitzlaff (1993) found that SES accounted for less than 20% of the variance in academic achievement instead of over half. Moreover, "in central city schools, where the variations in income and achievement [were] greater, student SES [explained] only 8% of the variance" (White et al., 1993, p. 340).

The effects of school SES appear to work in both directions. Just as

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[13]See, e.g,. Bulach, Malone, & Castleman (1995), in which the authors found a "significant positive relationship between the socioeconomic status of *students* and achievement" (p. 26, emphasis added) in a study in which "the unit of analysis . . . was the school" (p. 25).

higher school SES has been found to be associated with higher achievement, lower school SES appears to have devastating effects on academic achievement. Schellenberg (1999) noted that even students receiving no lunch subsidy achieve "much less . . . if they attend high poverty schools" (p. 137), and Mayer (1991) found "little evidence that disadvantaged students [gained] proportionately more from increases in schools' mean SES than advantaged students [lost] from decreases in mean SES" (p. 330; see also Puma et al., 1997). A 1981 assessment of Chapter I also found that "non-poor students attending a school with large proportions of poor students [were] more likely to fall behind than poor students who [attended] a school with a small proportion of poor students" (Kennedy, Jung, & Orland, 1986, p. 22). There also is some evidence that mean high school SES may have a greater effect on affluent students than on low income students (see Mayer & Jencks, 1989; Bryk & Driscoll, 1988).[14]

In short, if data are analyzed at the individual student level, only a modest relationship appears to exist between SES and academic achievement. Studies that use data aggregated at the school and community level, however, often find much stronger relationships.[15] These stronger relationships may occur for several

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[14]Mean SES of high schools also may have "more impact on the cognitive skills of Black students than the cognitive skills of White students" (Mayer & Jencks, 1989, p. 1442).

[15]But see Brookover et al. (1978), who found in a study of 24 Michigan elementary schools that school mean SES never added "more than 5% to the [explained] variance . . . after the effects of climate variables [were] removed" (p. 312). See also Rutter, Ouston, & Mortimer

reasons, including the natural statistical effects of data aggregation, the fact that schools "reflect and support the class structure of the communities they serve" (Hodgkinson, 1995, p. 178), or the possibility that "the average SES of the student body [may influence] the aspirations of individual . . . [students] in the direction of conforming to the majority" (Teahan, 1974, p. 246).

Separating Individual-Level Characteristics

From School-Level Characteristics

Only a few, relatively recent research studies have attempted to control for aggregate student characteristics when examining individual students' achievement. Even fewer have tried to determine with specificity the differential effects of individual and aggregated student characteristics on student achievement.

In a descriptive study of eighth-grade student data from NELS, Anderson, Hollinger, & Conaty (1993) found that "low SES students in low poverty schools [scored] higher than their counterparts in high poverty schools" (p. 23). Moreover, all students attending high poverty schools, regardless of their SES, tended to have lower achievement than those attending low poverty schools (Anderson et al., 1993, p. 31). These results indicated that school SES had an effect on student achievement above and beyond that of students' individual SES and confirmed results from earlier analyses which also found that the average social

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(1979).

class of schools has a separate, albeit small, effect on students' achievement beyond that of their individual social class (Kennedy et al., 1986; Alexander, Fennessey, McDill, & D'Amico, 1979). However, Anderson, Hollinger, & Conaty (1993) also noted that high SES students tended to outscore low SES students in reading and mathematics, even when the high SES students attended high poverty schools and the low SES students attended low poverty schools (p. 23). These results suggested that the effects of individual poverty on academic achievement were greater than those of school poverty.

In a series of linear regression studies, Caldas & Bankston (1997) analyzed the performance of 10th-grade students on the Louisiana GEE (see also Caldas, 1993; Bankston & Caldas, 1996). They found that school poverty had no effect on student achievement but that individual poverty had a small negative effect. They also found that the family social status [defined as parents' educational and occupational level] of both individuals and their student peers had substantial positive effects on student achievement. These results indicated that "attending school with classmates who [came] from higher SES backgrounds [tended to positively raise students'] academic achievement, independent of [their] own SES background, race, and other factors" (Caldas & Bankston, 1997, p. 275). However, Caldas & Bankston also noted that the effects of SES differed by race. While the most important individual-level influence on White students' scores was family social status, the "percentage of African-American students in

schools [was] by far the strongest influence on test scores of African-American students" (Bankston & Caldas, 1996, p. 548), even when controlling for individual-level minority status and individual- and school-level SES characteristics (see also Caldas, 1993; Caldas & Bankston, 1997). Indeed, the achievement gap between White and African-American students remained even when controlling for all other individual- and school-level factors (Bankston & Caldas, 1996; see also Yancey, Breeding, & Freely, 1999). The authors thus concluded that "although the significance of race in other parts of the United States may have declined as an independent factor apart from class and economics (Wilson, 1978), such is apparently not the case in Louisiana - at least not with respect to school achievement" (Caldas & Bankston, 1997, p. 275).

Schellenberg (1999), in a series of studies of four Minnesota school districts, noted that school poverty concentrations affect children's achievement as much as their own poverty and that students from poor neighborhoods appeared to benefit academically from attending more affluent schools (p. 130). However, he also noted that "these results were not as strong with less extreme shifts, such as when a student moved from an area of 60 to 80% poverty to a school between 20 and 40%" (Schellenberg, 1999, p. 137). These results appear to contradict earlier findings by Mayer & Jencks (1989), who compared "high school graduates who had the same test scores in 9th or 10th grade and [who] came from families of the same SES but attended different high schools" and

found that "the mean SES of the school [had] almost no effect on [students'] chances of planning to attend college, actually attending college, or graduating from college" (p. 1442; see also Hauser, Sewell, & Alwin, 1976; Nelson, 1971; McDill & Rigsby, 1973; Alwin & Otto, 1977; Jencks & Brown, 1975).

Several HLM studies have attempted to separate out the effects on student achievement of individual- and school-level demographic characteristics. Raudenbush & Bryk (1986), in an analysis of 176 public and Catholic schools in the HS&B study, noted that both student SES and school SES had independent positive effects on student achievement, although the effect of student SES was more modest. They also found that school SES affected "the strength of the SES-achievement relationship within schools" and thus "a student's social class [had] a stronger effect on individual achievement in higher social class schools than in [more disadvantaged] schools" (Raudenbush & Bryk, 1986, p. 11). These results were confirmed in a later study of 198,000 high school seniors in California, which found that "average achievement levels [were] higher in schools with students of higher SES [defined as parental education], independent of the status of individual SES on individual achievement" (Rumberger & Willms, 1992, pp. 389-390).

In a study of high school seniors from the 1990 NAEP mathematics assessment, Lee, Croninger, & Smith (1997) found that the contextual effect of school SES remained strong (effect size of 0.46 SD), even when controlling for

student-level SES, and that "neither minority concentration nor school size [had] independent effects on achievement" (p. 112). These results were similar to those of the *Prospects* study of Chapter I students, which found that the poverty level of schools, "over and above the economic status of [individual students], . . . [was] negatively related to standardized achievement scores" but that "the proportion of Black and Hispanic students [had] inconsistent associations with student outcomes" (Puma et al., 1997, p. 73).

Summary

In general, "studies have experienced persistent difficulty in separating the effects of social class from those of race" (Bazemore & Noblit, 1978, p. 346). Correlations between individual SES and individual minority status usually are fairly strong (see, e.g., Caldas & Bankston, 1997), and correlations between school SES and school minority concentrations usually are even higher (see, e.g., Caldas & Bankston, 1997; Flaxman et al., 1998; Yancey et al., 1999; National Center for Educational Statistics, 1997). In a study of 7,000 schools in the East and Midwest, Yancey, Breeding, & Freely (1999) found that while 4% of achievement variance was explainable by schools' minority concentrations and 13% by school SES, 36% of the variance was shared between the two. Furthermore, Flaxman, Schwartz, Weiler, & Lahey (1998) noted that "while only a twentieth of the nation's segregated White schools face the conditions associated with concentrated poverty among their children, more than 80% of African-

American and Latino schools do" (see also Orfield et al., 1997). These confounding effects of SES and minority status are pernicious both at the individual and school levels (see, e.g., National Center for Educational Statistics, 1997) and underscore the importance of conducting research with models that separate out the effects of individual- and school-level demographic characteristics.

Other Student and School Demographic Characteristics

As can be expected, researchers investigating factors related to student achievement have not been monolithic in their approaches. In addition to examinations of factors related to race and SES, other student and school characteristics have been investigated as well. Some of the most widely-researched areas pertain to student sex and English proficiency, class size, and school size and urbanicity.

Student Sex

One characteristic frequently examined by researchers in relation to academic achievement is student sex. Differences in student sex have been found by researchers to be associated with differences in academic achievement. However, instead of general differences in achievement existing between girls and boys, differences usually have been found only in particular subject areas, such as mathematics or writing.

In 1992, the American Association of University Women (AAUW), which has been at the forefront of the issue of girls and achievement during the past decade, issued a report that received a great deal of scholarly and public attention. Entitled *How Schools Shortchange Girls*, the report noted that gender gaps existed between girls and boys in both mathematics and science achievement (American Association of University Women, 1992). The AAUW report was based on data from the 1986 NAEP assessment and noted that these gender gaps in mathematics and science were consistent across racial and ethnic lines (Orenstein, 1994).

The AAUW report affirmed findings from previous research. For example, several researchers had found that mathematics achievement differences existed related to student sex. In a study that used data from the first follow-up of the 1980 national High School and Beyond study, differences were found between girls and boys in tenth-grade mathematics achievement (Ethington & Wolfle, 1986). Ethington & Wolfle (1986) further noted that the higher achievement exhibited by boys may be attributable to both ability and attitudes. In another study, one that aggregated the results from twenty-four surveys of large, nationally-representative samples, including the 1986 NAEP assessment, Cole (1997) also found small, but significant, differences to exist between girls and boys in mathematics achievement (see also Puma et al., 1997).

Similar findings have been reached regarding science achievement. For

example, Steinkamp & Maehr (1983), in a synthesis of 66 articles and reports, found that boys tend to achieve slightly better in science than girls. Moreover, like Ethington and Wolfle (1986) did for mathematics, they attributed the differences in science achievement to both boys' ability and attitudes (Steinkamp & Maehr, 1983). In another study, one that used student achievement data from NELS, researchers found that not only did differences exist in tenth-grade boys' and girls' science achievement but also that the advantage enjoyed by boys actually increased from eighth to tenth grade (Burkam, Lee, & Smerdon, 1997). These findings were consistent with other research that has noted that sex differences in achievement tend to increase over the school years (Cole, 1997; Callahan & Clements, 1984; Dossey, Mulis, Lindquist, & Chambers, 1988).[16] Lee & Burkam (1996), however, noted that the gap in science achievement may not include all science disciplines but rather may be limited to the physical sciences; in the life science area, eighth grade girls in NELS actually achieved better than boys.

The AAUW report noted that the gender gap in science was increasing but that the gender gap in mathematics was declining (American Association of University Women, 1992). In contrast, however, Cole (1997) found that sex-related differences in both mathematics and science achievement have decreased dramatically over the past 30 years. Cole (1997) also noted that,

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[16]This phenomena may suggest that "the decline of female achievement [in mathematics and science] is the result of a strong pattern of socialization to . . . success or failure rather than to gender differences in innate ability" (Schwartz & Hanson, 1992).

unlike the academic progress exhibited by their female counterparts, boys have yet to lessen the advantage that girls have traditionally enjoyed in language ability and writing skill (p. 14). Data from a national sample of Canadian students also has affirmed the advantage held by girls in both reading and writing (Council of Ministers of Education, 1999; see also Puma et al., 1997). In addition to reading and writing, girls also may outperform boys in the fine arts. A review of the data from the NAEP 1997 Arts Assessment for eighth-graders showed pronounced differences in achievement by gender, with girls outperforming boys in all three art forms assessed (music, theatre, and visual arts) (White & Vanneman, 1999).

While much evidence thus exists that points to sex differences in achievement, at least in certain subject areas, there also is conflicting research on the matter. For example, recent data from the Third International Mathematics and Science Study (TIMSS) showed no sex differences to exist for general mathematics achievement, at least in the United States (National Center for Educational Statistics, 1998). Similarly, data from a random sample of more than 37,000 Canadian students showed no statistical difference between 13-year-old girls and boys in science achievement (Council of Ministers of Education, 1997), while a parallel study showed no difference in Canadian 13-year-old students' mathematics achievement (Council of Ministers of Education, 1998). However, the Canadian studies did show slightly higher achievement for 16-year-old boys

in both mathematics and science (Council of Ministers of Education, 1997; Council of Ministers of Education, 1998) and 12th-grade American boys in TIMSS exhibited higher achievement for both physics and the advanced mathematics section (National Center for Educational Statistics, 1998).

It thus appears that there may be some academic subject areas in which boys tend to do better than girls, such as mathematics or science, and others in which girls tend to do better than boys, such as reading or writing. However, research also exists that finds no achievement differences related to sex. As a result of these conflicting research findings, student sex probably should continue to be included as a factor to be studied in student achievement research.

Student English Proficiency

Many students in our country are limited in their English proficiency, and it stands to reason that these students are likely to have greater difficulty in school than those who are not. Students need to be able to read, speak, and write English if they are to be successful in classes taught in the English language, and indeed students whose "native language is other than English and [whose] skills in speaking, reading, or writing English are such that they can derive limited benefit from school instruction in English" (Puma, Jones, Rock, & Fernandez, 1993, p. 321) have been found to exhibit lower academic achievement than peers who are not limited English-proficient (LEP).

In 1982, O'Malley noted that over half of LEP students below the age of 14

were at least one-half year below grade level in reading. Other researchers have reported similar findings for LEP students' achievement, in both reading (Carlson & Strang, 1988; Cox et al., 1992; Puma et al., 1997) and mathematics (Carlson & Strang, 1988; Puma et al., 1997). In the *Prospects* study of Chapter I students, Puma et al. (1993) found that LEP students were "greatly overrepresented" among students who scored "below the 35th percentile on nationally normed achievement tests" (p. 323) and that the gap between LEP and non-LEP students was not narrowing (see also Puma et al., 1997). Data from NELS have supported these findings, showing a moderate, but significant, relationship between LEP status and educational achievement (Singh & Hernandez-Gantes, 1996).

The lower achievement exhibited by LEP students is particularly important given the changing demographics of today's students. An increasingly diverse student population is now attending American schools, and numerous students enter school without full English proficiency. One study estimated that over 1.3 million LEP students attend public and private schools in the United States (Young et al., 1984), while another estimated the total number of students receiving language-related special services to be about twice that, at 2.6 million (Pelavin Associates, 1985).[17] While the large majority, about three-fourths, of

[17]The total in the Pelavin Associates (1985) study was higher because it included both LEP students and non-English-language background (NELB) students. NELB students are those students who live in a home where the primary language is one other than English. Unlike LEP students, the English language skills of NELB students are sufficient for them to derive benefit

LEP students are Spanish-speaking, significant numbers of LEP students also can be found who speak Vietnamese, Hmong, Cantonese, or Cambodian (Development Associates, 1993). The number of LEP students in America continues to increase every year (National Center for Educational Statistics, 1997), with the greatest gains exhibited by Spanish-speaking students (Development Associates, 1993).

Most LEP students still are concentrated within a few geographic areas. California, Texas, and New York contain almost half of the nation's LEP students, and in some cities almost half of the population may speak languages other than English at home (Development Associates, 1993). This concentration of LEP students within just a few states and within central cities has allowed many school systems to ignore the issue of LEP student achievement to date. However, as LEP students are increasingly found in all areas of the country, a growing number of districts will face the issue of addressing the special language needs of these students.

In addition to dealing with LEP students' language needs, districts also must often address needs related to LEP students' socioeconomic status. Students who are LEP often live in poverty (Burkheimer, Conger, Dunteman, Elliot, & Mowbray, 1989); indeed, Puma et al. (1993) noted in the *Prospects* study that over 33% of the Asian / Pacific Islander and Hispanic first-grade

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from school instruction in English.

students receiving Chapter I services were LEP. For the third grade, LEP percentages were 25% for Asian / Pacific Islander Chapter I students and 44% for Hispanic Chapter I students (Puma et al., 1993).

Some researchers have gone so far as to state that any LEP-related differences in achievement may be attributable to students' SES rather than their LEP status (Birman & Ginsburg, 1983; Sole, 1990), especially in poor schools, which can have more than "three times the number of LEP students in compensatory programs than wealthy schools" (Development Associates, 1993). Yet while poverty undoubtedly is an influence upon LEP students' academic achievement, it also is true that lower test results probably occur because LEP students' achievement reflects their language proficiency as well as their academic knowledge (LaCelle-Peterson & Rivera, 1994; Secada, 1994). This is in contrast to non-LEP students, who presumably are being measured primarily on their content knowledge.

In sum, there appears to be little to no evidence to contradict the research finding a relationship between LEP status and academic achievement. While a few researchers have argued that LEP students' poverty is the real issue rather than their limited English proficiency, most researchers have found the link between LEP status and low achievement to be more directly related to LEP students' low English language skills. The limited English proficiency of students seems to be an important factor to consider when conducting student

achievement research, especially as a growing number of districts nationwide face the need to accommodate the special needs of these students.

School Size

A great deal of attention has been paid lately to the issue of school size. Urban and suburban high school enrollments of 2,000 and 3,000 are quite common, and in some cities schools may be nearly twice that large (Henderson & Raywid, 1994). Many commentators have wondered if the large, comprehensive middle and high schools so famously espoused by Conant (1959) are worth the potential alienation from peers and adults that students may suffer in return (Fowler & Walberg, 1991; Campbell, Cotterell, Robinson, & Sadler, 1981). Chase-Lansdale, Gordon, Brooks-Gunn, & Klebanov (1997) have stated that "sheer crowdedness [in schools] may potentiate feelings of anxiety and danger" (p. 83), and indeed students may be at risk of losing meaningful contact with caring school professionals simply because of the sheer number of students present in the schools they attend (Fowler & Walberg, 1991; Campbell et al., 1981). In addition to potential student emotional and social alienation, the research literature is replete with evidence that students' academic achievement may suffer as well.

In what may be the most sophisticated recent look at the effects of school size on academic achievement, Lee & Smith (1997) used a hierarchical linear model to analyze data from the first three waves of NELS. They found that the

"ideal" high school enrolls between 600 and 900 students, and that students in smaller schools were found to learn a little less than those in the ideal range. Students in larger schools were found to learn "considerably less" (Lee & Smith, 1997, p. 205). The negative influence of school size on achievement was especially great in schools with more than 2,100 students (Lee & Smith, 1997).

Earlier large-scale research also had found that larger school sizes have negative influences upon student achievement. For example, Eberts, Kehoe, & Stone (1982) used data from 300 school districts nationwide to find that student achievement was higher in small and medium-size schools. In another study, Huang & Howley (1993) analyzed the Iowa Test of Basic Skills (ITBS) scores of more than 13,000 Alaskan elementary and middle school students to find that students in small schools significantly outperformed their large school peers. The academic advantages of smaller schools have been found to exist even when variables other than size, such as student or staff characteristics or the rural nature of the school, are held constant (Cotton, 1996b; Walberg, 1992).

Student achievement is not the only student behavior that has been found to be negatively affected by larger school sizes. For instance, Barker & Gump (1964) found that students in smaller schools are more likely to participate in extracurricular activities, a result corroborated in a later study of over 10,000 high school seniors in New York state (Schoggen & Schoggen, 1988). Students in smaller schools also have been found to generally have a more positive attitude

toward school (Fowler & Walberg, 1991; Howley, 1994; Gregory & Smith, 1983), to have higher rates of school attendance (Gregory, 1992; Fowler & Walberg, 1991), to have more positive self-concepts (Rutter, 1988), and to experience a greater sense of belonging and fewer feelings of alienation (Campbell et al., 1981; Fowler & Walberg, 1991; Gregory, 1992; Burke, 1987). Smaller schools also generally have lower dropout rates (Gregory, 1992; Toenjes, 1989; Fetler, 1989) and lower rates of negative social behavior (Gregory, 1992; Burke, 1987).

In addition to the overall negative effects generally associated with larger school sizes, differential effects on achievement have been found to exist for low SES and minority students. For example, Lee & Smith (1997) found that achievement differences between low and high SES students were less in smaller schools than in larger schools. Other researchers have reported similar findings (see, e.g., Bryk, Lee, & Holland, 1993; Lee, Bryk, & Smith, 1993; Berlin & Cienkus, 1989; Eberts, Kehoe, & Stone, 1982; Howley, 1994; Rutter, 1988). Lee & Smith (1997) also found that the negative relationship between school size and achievement is greater in schools with larger numbers of minority students. Cotton (1996b) noted that although low SES and minority students are the ones that experience the greatest harm from attending larger schools, they also are the ones most likely to be in such schools.

A few studies have found little or no differences to exist between the achievement levels of students in large and small schools. For example, Puma et

al. (1997) found in the *Prospects* study of Chapter I students that school size had "limited and inconsistent connections with student outcomes" (p. 73; see also, e.g., Caldas, 1993; Edington & Martellaro, 1989). However, even if no differences do exist between small and large schools,"none of the research finds large schools superior to small schools in their achievement effects" (Cotton, 1996b). Thus, achievement of students in small schools "is at least equal" to that of students in larger schools (Cotton, 1996b), and there are many studies that show that it is superior (see, e.g., Haller, Monk, & Tien, 1993; Fowler & Walberg, 1991; Gregory, 1992).

The evidence seems to be fairly clear that smaller schools are better for students, especially for poor or minority students. Whether school size is a proxy for other factors (Lee & Smith, 1997; McGuire, 1989) or a key structural variable in its own right (Howley, 1996), many districts have begun to act upon the evidence that larger schools may be of detriment to students. But while initiatives such as the creation of schools-within-schools are not uncommon (Burke, 1987), simultaneous consolidation of rural schools continues to proceed apace (Schoggen & Schoggen, 1988) and the academic effectiveness of smaller schools often is sacrificed for purposes of fiscal efficiency.[18] In light of such

[18]While larger schools often are assumed to be less expensive to operate and to offer richer curricula than smaller schools, neither of these necessarily may be true (Gregory, 1992; Fowler & Walberg, 1991; Nachtigal, 1992; Williams, 1990). Moreover, there is a large body of research that "affirms the superiority of small schools" in the "affective and social realms" (Cotton, 1996a). Berlin & Cienkus (1989) have stated that children's instructional needs, rather than districts' and schools' organizational needs, should determine the structure and organization of

conflicts, the issue of school size, and its effects upon student achievement, is one that continues to be important.

Class Size

In addition to the relationship between smaller school size and higher levels of student achievement, there appears to be evidence that smaller class sizes positively influence student achievement as well. Many studies have found an association between class size and student achievement, including the most famous, Tennessee's Project STAR (Student-Teacher Achievement Ratio).

Project STAR was a five-year study of almost 12,000 Tennessee students and is generally recognized as the "largest, longest-lasting study to date on the effects of smaller classes" (Viadero, 1999). An experimental, rather than empirical, study, Project STAR randomly assigned students to classes that ranged in size from 13 to 25 students. All students were in kindergarten through third grade. Early results showed that students in the smaller classes (i.e., those with 17 or fewer students) exhibited higher reading and mathematics achievement than did their peers (Achilles, Finn, & Bain, 1998). This academic edge was maintained even after students returned to regular classes and persisted as late as the eighth grade (Office of Educational Research and Improvement, 1999). Minority and poor students from urban schools were found to especially benefit from the smaller classes (Viadero, 1999; Achilles et al.,

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our nation's schools.

1998).

In a follow-up study entitled Project Challenge, Tennessee implemented the findings of Project STAR by phasing in smaller class sizes for 16 of the state's poorest school districts. In 1993, three years after Project Challenge was initiated, participating school districts had "moved from near the bottom of school district performance in Tennessee to near the middle in both reading and mathematics for second grade" (Office of Educational Research and Improvement, 1999).

Together Project STAR and Project Challenge have been called "one of the great experiments in education in U.S. history" (Mosteller, Light, & Sachs, 1996), and at least twenty states and the United States Congress have enacted measures to help decrease class size because of the findings from the Tennessee studies (Viadero, 1999). Two of the more notable initiatives include Wisconsin's Student Achievement Guarantee in Education (SAGE) Program and California's Class Size Reduction Program, both of which began in 1996 (Office of Educational Research and Improvement, 1999). The most recent findings from Project STAR indicate that the benefits of smaller K-3 classes may persist beyond eighth grade and into high school: students from small grade school classes were found to be more likely to take challenging high school courses and receive honors diplomas, more likely to be inclined to go to college, and less likely to drop out of school (Viadero, 1999). Although these findings are still

preliminary, it is likely that, as a result, even more states will enact measures designed to decrease class size.

The findings from the Tennessee studies mirrored the results of previous research that had shown the positive influences of smaller class size upon student achievement. In two meta-analyses of 77 empirical studies, Glass & Smith (1978) found that smaller classes were associated with higher achievement at all grade levels. This was especially true if classes were smaller than 20 students and if students were in the small classes for more than 100 hours (Glass & Smith, 1978). In a "best evidence synthesis" that selected for review only those class size studies that lasted at least a year, that involved a substantial reduction in class size, and that involved either random assignment or initial matching of students, Slavin (1989) also found that reductions in class size had a small, but positive, effect on student achievement. However, he also noted that those effects were not found to persist after students returned to regular classes (Slavin, 1989).

In a study that combined data from three nationally-representative datasets, Wenglinksy (1997) reported that class size was an important predictor of both fourth-grade and eighth-grade students' mathematics achievement. He also found that the largest mathematics gains were in those school districts that had both students of below-average SES and above-average teaching costs (Wenglinksy, 1997). Robinson & Wittebols (1986) also found that reducing class

size positively influenced student achievement, and noted that the effects were greatest for students in kindergarten through third grade and, like in Project STAR, for disadvantaged and minority students.

Although a great deal of research has found a positive relationship to exist between smaller class size and student achievement, the research literature is not unanimous in its findings. For example, the noted economist Eric Hanushek, in a review of 112 studies, reported that student-teacher ratio was not an important correlate of student performance (Hanushek, 1986; see also, e.g., Puma et al., 1997). Hanushek's findings have been disputed, however, and other researchers, using different analytical techniques to examine the same data, have found that smaller classes do positively influence student achievement (see Hedges, Laine, & Greenwald, 1994; Laine, Greenwald, & Hedges, 1995).

Thus despite Hanushek's warnings of the dangers of instituting statewide class-reduction initiatives based on the findings from Tennessee's Project STAR (Hanushek, 1998), it is likely that educators and politicians will continue to work together to reduce class sizes in the hope of furthering student achievement. To date the bulk of research evidence seems to support smaller class size as an important factor that influences student achievement.

School Urbanicity

Many studies have found that children who live in urban areas are particularly at risk for school failure. Urban children often possess a number of

risk factors that can negatively impact upon school achievement, including poverty, welfare dependence, the absence of one or both parents, the non-married status of mothers, and the low educational attainment of one or both parents (Bureau of the Census, 1997). While students in rural and suburban areas often possess these characteristics as well, these risk factors are more likely to be prevalent in urban children's lives and urban children are more likely to have several of these risk factors simultaneously. In addition to these common risk factors, urban children often suffer consequences unique to their urban living environment. For example, children in urban communities are more likely than suburban or rural children to be victimized by crime and are less likely to have access to regular medical care by a physician, instead relying more upon hospital emergency rooms, clinics, or community health centers (Lippman, Burns, & McArthur, 1996). Urban children also are more likely to engage in risk-taking behaviors, such as teenage pregnancy, which may affect their schooling (Lippman et al., 1996). These types of non-academic influences take a toll on the physical and emotional well-being of urban children and support the commonly-held supposition that the attainment of desirable academic outcomes by urban students generally is more difficult than for rural or suburban students(Lippman et al., 1996).

In addition to adverse community-related factors, urban students often suffer additional disadvantages related to the schools that they attend. In *Quality*

Counts '98. The Urban Challenge: Public Education in the 50 States, which may be "the most detailed analysis ever of urban education in the 50 states," (Education Week, 1998, p. 6), it was found that students in urban districts generally attend schools that are larger, have less involvement from parents, and have higher truancy rates (Education Week, 1998). Students in urban districts also have been found to generally attend schools with higher concentrations of poor students, minority students, and students with difficulty speaking English (Lippman et al., 1996) and to attend schools with inadequate supplies, shortages of licensed teachers, and greater rates of student-to-student violence (Association for Supervision and Curriculum Development, 1996).

These problems associated with urbanicity are especially relevant for poor or minority children. More than 30% of urban children live in poverty, a rate more than twice that of suburban children (13%), and almost 50% of urban children are minorities, a rate about twice that of the national average of 24.8% (Lippman et al., 1996). These tendencies are reflected in urban schools. For example, only 38% of urban students attend schools with poverty concentrations of 20% or less, in sharp contrast to the 75% of suburban students that do so (Lippman et al., 1996). Moreover, although the composition of public schools nationally is about 31% minority, in many cities that percentage is much higher (Orfield et al., 1997). In fact, in our nation's ten largest central city school districts[19] the average

[19]New York, Los Angeles, Chicago, Miami, Philadelphia, Houston, Detroit, Dallas, San Diego, and Memphis.

minority percentage is over 85%, and in all large cities the typical Black or Latino student attends a school that is only about 17% White (Orfield et al., 1997).

Research has shown that urbanicity of students and schools is associated with low student achievement. For instance, data from NELS show that the academic achievement of eighth-graders in urban schools is lower than that of both suburban and rural students (Lippman et al., 1996). By the tenth grade, the difference in rural and urban students' achievement disappears, but the gap between urban and suburban students still persists (Lippman et al., 1996). Similarly, data from *Quality Counts '98*, which come from the 1994 NAEP reading and 1996 NAEP mathematics and science tests, highlight the particularly poor achievement of high poverty urban schools. Indeed, the NAEP reading achievement test data in *Quality Counts '98* show that the percentage of students in high poverty urban school districts scoring at the "basic" level or higher in reading (23%) is just over one-third of the achievement level of students in all non-urban school districts (63%) and is still only one-half of the achievement level of students in high poverty non-urban school districts (46%) (Education Week, 1998). With achievement levels so low, it is no wonder that Jonathan Kozol, a noted writer on social issues, referred to many of these high poverty urban schools as being "death zones" of education (Kozol, 1991, p. 5).

While the research literature generally supports the association of urbanicity with lower academic achievement, a handful of studies have found

urban students' achievement to be the same or higher than that of other students, especially those in rural schools. For example, a study of rural students in Kansas found that the American College Testing (ACT) college admissions test scores of rural students were about two points lower than those of urban students in every category of the ACT (Downey, 1980). A study of New Mexico high school students also found that rural students performed the same as those in urban areas (Ward & Murray, 1985), as did a study of fifth-graders in Missouri (Alspaugh, 1992). In another study of New Mexico students, researchers found that there was no rural-urban achievement gap once SES and race were held constant (Edington & Martellaro, 1984).

Yet despite the existence of a handful of studies to the contrary, the association of urbanicity with lower student achievement appears to be fairly well-accepted in the research literature and a variety of detrimental community, school, and individual characteristics have been identified as factors affecting urban students' achievement. One consequence of the confluence of these factors is that students in urban schools are far less likely to graduate on time than are students in non-urban schools (Education Week, 1998). Another is that adults who attended urban schools are much more likely to later be unemployed and to be living in poverty (Lippman et al., 1996). These findings are particularly important when one considers that one-fourth of America's student population, or 11 million students, currently attends school in an urban district (Education

Week, 1998). Although a few studies have found that urban students' achievement is the same or higher than that of other students, the urbanicity of students and their schools thus seems to be an important consideration for researchers studying student achievement.

Conclusion

In sum, it appears that a number of individual and school demographic characteristics can influence student achievement. Some school demographic factors that have been found to be associated with lower student academic achievement are class size, school size, and school urbanicity. High percentages of minority students or low income students also often have been found to be associated with low student achievement. These five school characteristics probably constitute the most-commonly investigated demographic areas in the research on academic achievement.

In addition to these school characteristics, several individual student characteristics commonly have been found to be predictors of academic achievement. These include student poverty status, minority status, sex, and limited English proficiency. While there also are a number of other factors that have been identified by researchers as commonly influencing student achievement, such as school climate, administrative leadership, teacher experience and qualifications, and the level of parent involvement (Cruickshank, 1990; Bliss, Firestone, & Richards, 1991; Coleman et al., 1966), demographic

factors generally are easier to identify and likely would be key components of school district student assignment plans.

This chapter summarized the research on student and school demographic characteristics as they relate to academic achievement. This chapter also included an overview of the legal context in which school district student assignment plans operate. The next chapter describes the primary and secondary research questions that guided this study as well as the design and methodology of the study and the variables used in the statistical analysis. Chapter III also discusses the limitations of this study and the appropriateness of the statistical model and the research instrument. Chapter IV presents the results of the study's statistical analysis, which used hierarchical modeling techniques to analyze the research questions. Chapter V discusses in further detail the results of the statistical analysis and their implications for future research and practice.