CENTER ON EDUCATION POLICY CEP

Are Private High Schools Better Academically Than Public High Schools?

Center on Education Policy

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I. Summary

Policymakers, parents, and other interested citizens often assume that private schools, on the whole, are better academically than public schools. But is this empirical assumption actually supported by evidence?

For the most part it is not, suggests the study of urban public and private high school students described in this paper.

About the Study

This study, commissioned by the Center on Education Policy (CEP) and conducted by researcher Harold Wenglinsky, was based on statistical analyses of a nationally representative, longitudinal database of students and schools (the National Educational Longitudinal Study of 1988-2000, or NELS). The study focused on a sample of low-income students from inner-city high schools. This focus was chosen because policies for private school choice often target low-income, urban youth, on the grounds that these students should have the same advantage of a private school education that more affluent students already have. The study compared achievement and other education-related outcomes for students in different types of public and private schools, including comprehensive public high schools (the typical model for the traditional high school); public magnet schools and "schools of choice;" various types of Catholic parochial schools and other religious schools; and independent, secular private schools. Most importantly, the study took into account key background characteristics, including students' achievement before high school, their family's socioeconomic status (SES), and various indicators of parental involvement.

To test various assumptions made in this study, another researcher, Dong Wook Jeong, performed a series of sensitivity and replication analyses using the same group of students. These analyses included reorganizing the data quasi-experimentally using propensity score analysis (a statistical technique that estimates the effects of an educational "treatment" on a group of students when the treatment was not actually done). They also included testing the data for clustering (looking at whether the data converge around certain variables) and introducing other non-school controls, such as the influence of peers on student achievement. All of these analyses produced the same results as Wenglinsky's initial analysis—namely, that the private school effects, in most instances, could be explained by the demographics and family characteristics of the students.

Core Findings

The study found that low-income students from urban public high schools generally did as well academically and on long-term indicators as their peers from private high schools, once key family background characteristics were considered. In particular, the study determined that *when family background was taken into account,* the following findings emerged:

1. Students attending independent private high schools, most types of parochial high schools, and public high schools of choice performed no better on achievement tests in math, reading, science, and history than their counterparts in traditional public high schools.

2. Students who had attended any type of private high school ended up no more likely to attend college than their counterparts at traditional public high schools.

3. Young adults who had attended any type of private high school ended up with no more job satisfaction at age 26 than young adults who had attended traditional public high schools.

4. Young adults who had attended any type of private high school ended up no more engaged in civic activities at age 26 than young adults who had attended traditional public high schools.

Taken as a whole, these findings suggest that students who attend private high schools receive neither immediate academic advantages nor longer-term advantages in attending college, finding satisfaction in the job market, or participating in civic life.

This study did identify two exceptions to this general finding. The primary exception is that students who attended independent private high schools had higher SAT scores than public school students, which gave independent school students an advantage in getting into elite colleges. (These independent private schools enroll many students from affluent families and are often expensive and fairly elite themselves, with tuitions as high as $30,000 a year.) This finding suggests that while these schools are no better at teaching the subject matter, they may provide students with test-taking skills that help them further their education, or they may enroll students with higher IQs (aptitude tests like the SAT are a better measure of IQ than achievement tests are).

A second exception is that one special type of private school, Catholic schools run by holy orders (such as Jesuit schools), did have some positive academic effects. There are very few such schools, however; most Catholic schools are run by their diocese, not by an order (Meyer, 2007).

Unique Features of This Study

What accounts for the fact that the findings from this study are largely at odds with those of some earlier studies, which did find a private school academic advantage? Many past studies, beginning with that of Coleman, Hoffer, and Kilgore (1982), found a private school advantage even when students' socioeconomic status was taken into account. Yet these studies did not measure other aspects of family life that are also critically important in shaping students' academic, civic, and economic life.

This CEP-commissioned study, for the first time, included a range of family educational activities and attitudes towards schooling. When these were taken into account, the private school advantage went away. This suggests that the private school advantage is a chimera; it merely shows that private schools contain a larger proportion of children whose parents have characteristics that contribute to learning than do public schools.

In addition, this study, unlike many other public-private school comparisons, focused specifically on low-income, urban youth. It also looked at several long-term outcomes, in addition to high school achievement, and distinguished between several different types of public and private schools.

II. Prior Studies of Private School Effects

Decisions by parents or policymakers about private school choice are often rooted in the assumption that, by choosing private schools, families will improve the academic preparation of their children. This notion of a positive private school effect rests on a body of research that suggests private schools outperform public schools. This section briefly reviews the most relevant studies and describes how this study represents a departure.

Early Studies

The existence of a private school effect was first identified by James Coleman and his colleagues in a 1982 study (Coleman, Hoffer & Kilgore, 1982). That study found that, even after taking into account key background characteristics of students (mainly their socioeconomic status), students attending private high schools, on average, outperformed students attending public high schools. While the study was roundly criticized on a number of methodological grounds, Coleman and Hoffer in 1987 reanalyzed the national data from the 1982 study to respond to these criticisms and to replicate successfully their findings. The key issue, which comes up again in this paper, is whether the data are "cross-sectional" or "longitudinal." The first Coleman study looked at high school students at a single point in time; students were tested in various subjects at the same time they were attending their private or public school. Thus, finding a relationship between private school attendance and student achievement could simply mean that students who were higher performing *before* entering private school remained higher performing. The later Coleman study addressed this to some extent by following students from 10th to 12th grades and comparing student growth in performance over time. The researchers found that private school students did indeed experience more rapid growth than their public school counterparts.

Methodological issues aside, study after study has found a private school advantage. For example, a 1993 study by Bryk, Lee, and Holland found a Catholic school academic advantage, which the researchers attributed to a more cohesive academic and social environment in the Catholic schools.

Voucher Studies

After the study by Bryk and his colleagues, little work was done directly comparing private and public schools; however, a flurry of research examined the private school voucher programs that were starting to emerge around the country. Most of these programs focused on the elementary school level, but their findings may indicate what to expect at the high school level. One of the earliest voucher programs, in Milwaukee, was evaluated by John Witte, who found mixed results (Witte, 1996). A reanalysis of the Milwaukee data by Rouse (1998) found a lack of private school effects. Studies of privately funded voucher plans in New York City, Washington, D.C., and Dayton, Ohio, initially found positive effects for African American students (Peterson & Howell, 2001) although in later years of the program these effects washed out (Howell & Peterson, 2002). And an evaluation of a statewide program in Florida found positive effects there as well (Greene, 2001).

These findings about voucher programs have been disputed; for instance, the positive finding of the private voucher plans was based almost entirely on positive effects in the New York City program; the effects in Dayton and Washington, D.C. were not statistically significant. Still, until recently, little affirmative evidence had emerged showing that public schools performed as well as private schools. (For a fuller review of the research on private school effects to this point, see Belfield & Levin, 2005.)

Recent Studies

The debate about private school effects changed with a set of studies published in 2006 that used data from the National Assessment of Educational Progress (NAEP). The first of these studies, by Lubienski and Lubienski (2006), used hierarchical linear modeling, a technique that takes into account the multilevel nature of the data, to compare the achievement of public and private school 4th graders in mathematics. It found that when student background, mainly SES, was taken into account, students attending public schools actually outperformed students at private schools.

This finding was replicated in a larger study by Braun and his colleagues the same year (Braun, Jenkins & Grigg, 2006). This study looked not only at 4th grade mathematics, but at 4th grade reading, 8th grade mathematics, and 8th grade reading, using the same statistical techniques and taking into account largely the same background characteristics as the Lubienskis did. The study confirmed a negative effect for private schools in 4th grade math, found no difference between public and private schools for 4th grade reading and 8th grade math, and found a private school advantage for 8th grade reading.

Critics of these studies noted, however, that these studies suffered from a "fatal" flaw, namely their cross-sectional nature. NAEP collects data on students and schools at a single point in time. Thus, for a given year (in the case of these studies, 2003) the data can indicate whether public and private schools have different levels of student achievement. But it is not possible to attribute the different levels of achievement to private schooling; it may be that private schools are more likely to attract students who were already performing higher. To test this possibility, longitudinal data—that is, data that follow students over time—need to be collected to know how students were performing before they entered their current school. Other shortcomings of these studies have also been raised. Peterson and Laudet (2006) have noted that the student background characteristics examined in the study were measurable only for public school students. In particular, two measures of public school students' background were available, one that was based on student self-reports and covered all students in NAEP, and another that was based on administrative data and covered only a subset of students. Peterson and Laudet found that taking the student self-reports into account changed the results, producing a larger private school effect.

One other recent study has made use of longitudinal data that can address these issues. In a 2005 study, the National Association of Independent Schools (NAIS) compared public and private high schools using data from the National Educational Longitudinal Study of 1988-2000. NELS includes data not only on student achievement in high school, but also on educational outcomes after college, including civic-mindedness, job satisfaction, and educational attainment. The NAIS study found that the average private school student outperformed public school students on all of these measures. It did not, however, make full use of the data's longitudinal nature. The study did follow students after high school to obtain long-term outcomes.

But it did not take into account their performance prior to entering high school, an approach that would have addressed the shortcomings of the NAEP-based studies. And NELS does include such a prior measure of student achievement. Nor did the NAIS study take into account student background characteristics, such as socioeconomic status. Thus, although the NELS data seem a promising route for looking at current student achievement while taking into account prior achievement, the NAIS study did not accomplish this.

Different Methodology for This Study

Fortunately, using the more sophisticated statistical techniques of the earlier private school effect studies makes it possible to answer questions about the impact of prior achievement. As explained in more detail in section IV, this CEP-commissioned study examined a special subgroup of the NELS students, those who lived in the inner cities and whose families ranked in the lowest quartile of SES nationally. This group of 1,003 students, which constitutes a nationally representative sample of all inner-city, low-income high school students, was analyzed using a technique known as "regression analysis." Regression analysis makes it possible to take into account multiple factors that affect student outcomes. While this study did not use multilevel techniques, such as the hierarchical linear modeling used in the NAEP studies, it did use weights and design effects, statistical tools that are equally good at taking into account the nature of the data. (For more discussion of these and other methods used, see appendix A).

Consideration of Family Characteristics

One final wrinkle, unique to this study, needs to be noted. An ongoing debate among educational researchers is whether schools "make a difference." Until the mid-1960s, most researchers assumed that student performance depended on the quality of the school. But another bombshell report by Coleman and his colleagues, the Equality of Educational Opportunity Report of 1966 (Coleman et al., 1966), actually found few relationships between school characteristics and student performance. The researchers concluded that it was the family, not the school, that really mattered.

Various researchers, such as Eric Hanushek, have continued making the intriguing claim that student performance is largely predetermined by student background (Hanushek, 1997). Proponents of this view do not claim that educational policymakers should therefore wring their hands and give up on students. Rather, as Lawrence Steinberg argued persuasively in *Beyond the Classroom* (1997), greater attention needs to be paid to what parents can do to make a difference, from expressing to their children the value of a good education to helping them with their homework. Indeed, research has shown that these forms of parental involvement have an enormous impact on student learning (Epstein, 2001).

But what happens when parental involvement is considered in comparisons of public and private schools? One might conjecture that parents who enroll their children in private school are by definition more involved. By taking into account several measures of parent involvement in the NELS database, the CEP-commissioned study sought to see how much the school contributed to student outcomes and to what extent student performance was due to attentive parents.

III. Measuring the Private School Advantage

A superficial look at the differences in student achievement between public schools and various types of private schools suggests the existence of a private school advantage, especially in urban areas. This section reviews the differences in achievement according to type of school, before students' family background characteristics are considered. It examines both the 12th grade achievement of the 1,003 low-income, urban students in the NELS database, and changes in their achievement over the four years of high school. It also describes differences in family background between public and certain private school students that might account for some of these disparities in achievement.

Basic Differences in Achievement by Type of School

Student achievement data from the National Educational Longitudinal Study, unadjusted for family background, reveals private school advantages for low-income, urban youth in all four subjects measured—reading, mathematics, science, and history. NELS measured student achievement in these subjects by giving students assessments in grades 8, 10, and 12. Student scores were all put on a common scale, so a student scoring 30 points in 8th grade and 40 points in 10th grade could be said to have improved by 10 points.

At the typical urban comprehensive public high school, 12th grade students scored 29 points in reading, 41 points in mathematics, 20 points in science, and 32 points in history.

NELS also includes data on public school students in magnet schools (small public high schools with a well-defined theme) and public "schools of choice." Both types of schools draw many of their students on a non-geographical basis and are somewhat analogous to today's charter schools. (When the NELS data were first collected in 1988, few, if any states, had passed charter school laws, but magnet schools and other schools of choice were often permitted more flexibility in their educational programs.) Magnet schools and schools of choice had somewhat higher student achievement than comprehensive public schools. At public schools of choice, for instance, the average student scored 31 in reading, 44 in mathematics, 21 in science, and 32 in history.

Students at parochial schools performed still better. The typical student at a Catholic diocesan school (the most common of parochial schools) scored 32 points in reading, 46 points in mathematics, 21 points in science, and 34 points in history. And students at independent private schools scored best of all, averaging 43 points in reading, 60 points in mathematics, 27 points in science, and 38 points in history. Thus, it appears there is a private school advantage.

Yet this portrait of the schools does not take into account the backgrounds of the students attending them. For one, students enter high school at different levels of achievement, and it is possible that the average private school student is a higher performer than the average public school student before their first day in high school. Also, research has suggested again and again that other background characteristics of students can influence their academic success. Indeed, depending upon their social class, students may enter kindergarten with different achievement levels (Lee & Burkham, 2002). Possible reasons are that lower-income students have fewer educational resources in their home than students from higher-income

families, and their parents often have less available time and education to support their children's learning (e.g. Lareau & Horvat, 1999). If, as seems likely, students entering private schools are higher achieving to begin with and come from more advantaged backgrounds, the private school advantages seen in 12th grade could be a reflection of attracting previously successful students, rather than contributing to that success.

Differences When Prior Achievement Is Considered

Looking back to the 8th grade assessment scores of low-income, urban youth in the NELS database who entered public or private high schools provides some support for this view. The average student attending a comprehensive public high school had 8th grade scores of 22 points in reading, 30 points in mathematics, 16 points in science, and 27 points in history. The average "school of choice" student entered high school at roughly the same level, with 8th grade scores of 23 points in reading, 32 points in mathematics, 16 points in science, and 27 points in history. The typical student at a Catholic diocesan school, however, entered with higher 8th grade scores: 27 points in reading, 34 points in math, 17 points in science, and 30 points in history. And independent private school students also entered more advantaged, with scores of 23 points in reading, 36 in math, 14 in science, and 28 in history. It seems, then, that the data support the idea that private school students enter school academically ahead of public school students.

Since the tests were all measured on the same point scale, one can gauge how much students improved between 8th ands 12th grades. Change over time is important to observe because if students improve at the same rate, it raises a real question about private school advantages; on the other hand, if students at private schools gain more points over the four years, then perhaps private schools have conditions that support greater academic growth in their students than do public schools.

And indeed, private school students in the NELS database did appear to gain more during their four years of high school. Among public high schools organized along traditional lines, the gain was 6 points in reading, 11 points in math, 4 points in science, and 5 points in history. For public schools of choice, the gain was 9 points in reading, 12 points in math, 5 points in science, and 6 points in history. Thus, whereas students at public choice schools started out at roughly the same place as comprehensive public school students, they ended up somewhat ahead.

The pattern for Catholic diocesan students is reversed. Students at these schools started out ahead of comprehensive public school students, but gained about as much as comprehensive public school students during high school. For Catholic diocesan students, the reading gain was about 5 points, the math gain about 12 points, the science gain 3½ points, and the history gain 4 points. The group that both started out ahead and grew at a faster rate was the independent private school group. There, the gain was 20 points in reading, 23 points in math, 13 points in science, and 10 points in history. In short, the greatest academic growth occurred in independent schools, while the least growth occurred in comprehensive public and Catholic diocesan schools. (For a full presentation of these raw differences, see the Jeong paper at www.cep-dc.org.)

Differences in Student Background between Private and Public Schools

Still, it is not safe to assume that the greater gains at independent private schools are attributable to the schools. To the extent that students attending independent schools come from more affluent backgrounds, they may be more likely to progress rapidly. And, indeed, the data do indicate that independent students have many advantages over students at the other types of schools.

According to the NELS data, students at comprehensive public schools are of markedly lower SES than students at independent schools. The NELS data further indicate that the parents of public school students have lower expectations for their future education. Parents of comprehensive public school students are much less likely to expect their children to go further than a two-year college than are parents of independent school students, for whom at least two years of college is pretty much a given. Finally, student interactions with their parents are different at the two types of school. Parents of students at independent schools are much more likely to discuss schoolwork with their children and help them with it. Thus, the independent school student, in addition to starting high school ahead of the public school student, obtains more support from the family.

The family advantage is not purely a financial one. As might be expected, independent school parents are more affluent; otherwise, they could not afford independent school tuitions, which are the highest of all private school tuitions. They also offer an advantage referred to by researchers as "cultural capital." Affluent students often engage in different types of activities than less affluent students do. They are more likely to go to museums with their parents, take music lessons, participate in academic enrichment experiences, and discuss academic issues with their parents and peers. In many cases, less affluent students have access to these experiences only if they are offered by the school. These experiences form a store of cultural knowledge, or cultural capital, on which affluent students can draw in their classes and on assessments.

These differences in family background raise doubts about the alleged private school advantage. For one thing, the phenomenon of "creaming" is occurring. Like the cream on the top of non-homogenized milk, students who have performed better academically in elementary and middle school are more likely to gain entry into various private schools. Once there, it is true that at some types of private schools, student performance is accelerated. But this acceleration could just as easily be the result of another form of creaming, either socioeconomic or cultural. Simply comparing the different types of schools on all of these measures does not address the key issue: the relative impact of school organization and family background on educational outcomes.

To resolve that issue, this study used regression analysis, which is designed to address just these kinds of problems. Regression analysis permits researchers to look at an outcome, such as 12th grade student achievement in reading, and break it up into the component parts that are associated with it, in order to discover how much of student achievement is attributable to 8th grade achievement, SES, or cultural capital. The next section describes the findings from these regression analyses.

The exercise described in this section—that of comparing superficial differences in 12th grade achievement between public and private schools—could be performed with other outcomes from the NELS database, such as college attendance, civic-mindedness, and job satisfaction. And indeed, doing so would reveal more of the same. Private schools have consistently better outcomes than public schools, but these outcomes are potentially attributable to prior achievement, SES, and cultural capital.

IV. The Root Causes of the Private School Advantage

How does attending a parochial school relate to science test scores when SES and parental involvement in school are taken into account? How does attending an independent private school relate to job satisfaction several years down the line if the same student background variables are taken into account? This study sought to tease out these kinds of relationships. This section describes the study's findings about differences between public and private schools in student achievement and other outcomes, once various background factors are considered.

How the Study Was Conducted

This study hinged on data from the National Educational Longitudinal Study, particularly data concerning 1,003 low-income students attending urban high schools. These students are a subset of more than 13,000 8th graders who were selected from across the country to participate in NELS and who together formed a nationally representative sample of all 8th graders enrolled in U.S. schools. The NELS data collection began in 1988. Information about the 13,000-plus students was collected by the National Opinion Research Center, based at the University of Chicago. The team collected a battery of data from these 8th graders. These students were tested in four subjects (reading, math, science, and history) and answered a questionnaire on their school experiences, home experiences, and plans for later education and life. Their parents were also surveyed.

In 1990, these same students, now in 10th grade, were retested and resurveyed. The test results, as mentioned above, were put on the same scales as the 8th grade tests so that gains could be measured among the students. In 10th grade, two teachers and the principal were surveyed for each student. In 1992, when the students were in 12th grade, the procedure was repeated, except that parents were again included. In 1994, the same students were surveyed to find out what they did after high school, and in 2000 they were resurveyed to see what they were doing eight years after high school graduation.

The 1,003 students who were the focus of the CEP-commissioned study consisted of those among the 13,000 who were included in all of the survey waves, attended urban high schools, and had family incomes in the lowest quartile nationally of socioeconomic status.

Using a battery of statistical techniques, it is possible to paint a nuanced and textured picture of the extent of private school effects. Any given characteristic of students, schools, teachers, and parents can be said to "vary" when different students, teachers, and parents have different values of that characteristic. Different families have different adjusted gross incomes, and consequently income can be said to vary and is referred to in social science terminology as a "variable." Variables can be said to be correlated when the values of one change along with the values of another. To the extent that families with high incomes tend to have high levels of educational attainment, the two can be said to be correlated. This correlation is referred to as a "relationship," which is considered positive if the two variables go up and down together and negative if one goes up while the other goes down.

To tease out these kinds of relationships, this study used the technique of multiple regression analysis. The technique differs from simple correlation in that it shows the extent to which two variables go up and down together, while student values on a third variable are held constant. For instance, class size could be related to student achievement, assuming that students are of similar SES.

Influences on 12th Grade Student Achievement

As explained above, NELS measured the achievement of participating students in grades 8, 10, and 12 in four subjects. Students were tested in reading and language arts; mathematics, including algebra and geometry; science, including biology and chemistry; and history, including some civics and geography. The topics covered were intended to be broadly reflective of high school curricula, although they did not perfectly cover the curriculum content in any one state because academic standards varied by state.

For this study, regression analyses were conducted in the four subject areas. These analyses treated the 12th grade scores as the outcome variables. Because the issue of interest was differences among various types of school organization, the following types of schools were included as inputs:

- *Magnet schools:* Small public high schools with a well-defined theme that often draw students from beyond a specific attendance zone
- *Public schools of choice:* Schools that draw most of their students on a non-geographical basis
- *Catholic diocesan schools:* The most common type of Catholic school, subject to control by a superintendent in the office of the local bishop
- *Catholic holy order schools:* Schools founded and run by a religious order, such as the Jesuits, and which generally have the highest level of autonomy from the Church among Catholic schools
- *Catholic parish schools:* Schools run by the local congregation, independent of the episcopate
- *Non-Catholic religious schools:* Mostly Lutheran schools, as well as schools of other Protestant denominations, Muslim schools, or Hebrew schools.
- *Independent private schools:* Secular private schools, generally with very high- income students and high tuitions

Comprehensive public high schools were not included in the analyses as an input because they were intended to be the basis of comparison. A positive number for any given school would indicate a private school effect pertaining to that school.

In addition to specifying the different types of schools, the analyses took into account other inputs likely to influence 12th grade test scores. These included the following inputs:

- *Eighth grade test scores:* The 8th grade test scores in each of the four assessed subjects were compared with the 12th grade scores in a particular subject. By including these prior scores, the analyses were in essence expressing gains in scores between 8th and 12th grades, generally the high school years.

- *Socioeconomic status:* Even though all of the analyzed students were of below average SES, there was some variation in SES among them that needed to be taken into account.

- *Parental expectations:* Parents had varying expectations about the educational attainment of their children; one might expect children of parents with high expectations to outperform children of parents with low expectations.

- *Parental discussions:* Parents varied in the extent to which they discussed schoolwork with their children; one might expect that parent-child interaction in this area would be associated with high student performance.

- *Parental involvement in school activities:* One might expect parents who participated in a range of school activities, from attending parent-teacher conferences to serving on PTAs, to have children who performed better in school.

The first regression analysis focused on reading achievement (see **table 1**). As expected, the inputs of SES, parental discussion, parental expectations, parental involvement with the school, and 8th grade achievement in all four subject areas were all positively related to 12th grade reading scores. The strongest effects were for the 8th grade test scores. Among the school types, none had an advantage over comprehensive public schools except for the small number of religious order schools. These had an effect comparable in size to the parental discussion and expectation variables.

The second regression analysis was for math achievement. Here, unlike reading achievement, parental discussions and involvement had no effect, although SES and parental expectations did. Prior test scores in the four subjects had the largest effects, with the prior math score, not surprisingly, having the greatest effect. Among school types, the Catholic religious order schools performed better than comprehensive public schools, having the same effect size as SES and parental expectations. None of the other school types showed an advantage.

The third regression analysis focused on 12th grade science achievement as its outcome. Here SES proved influential, but the other parental variables did not. Prior achievement, particularly in math and science, had the strongest effects. None of the school types, even the religious order schools, differed in effect from the comprehensive public schools.

Finally, the fourth regression related the inputs to history achievement. Here parental expectations and discussion had a positive effect, as did the four 8th grade achievement scores. Among the various types of schools, only Catholic religious order schools evinced an advantage over comprehensive public schools. The size of this advantage was about half the effect of SES.

In sum, there appears to be no general private school advantage related to 12th grade achievement. Across subjects, only one of the seven types of school organization showed a discernable effect, and the effect was quite small. On average, the positive effect for religious order schools was about 1 point, meaning that of the 5-10 point gains discussed in the preceding chapter, only a single point for a single type of school could be attributed to the organization of the school.

Table 1. Public Versus Private Schools: Summary of Key Findings

Outcome	Finding of Private School Effect
Impact on reading achievement	Only positive effect for Catholic religious order schools; all school effects overshadowed by SES and parental involvement measures
Impact on mathematics achievement	Only positive effect for Catholic religious order schools; all school effects overshadowed by SES and parental involvement measures
Impact on science achievement	No positive effect for any school type; substantial effect for SES
Impact on history achievement	Only positive effect for Catholic religious order schools; all school effects overshadowed by SES and parental involvement measures
Impact on SAT math scores	Substantial effect for independent private schools, suggesting these schools have a college prep advantage
Impact on SAT verbal scores	Substantial effect for independent private schools, small effect for non-Catholic religious schools; suggests effect on college prep advantage
Impact on completion of at least some college	Independent schools have moderate advantage, Catholic diocesan schools have moderate disadvantage; all effects overshadowed by family background variables
Impact on civic-mindedness at age 26	No positive effect for any school type; substantial effect for family background
Impact on job satisfaction at age 26	No positive effect for any school type

SAT Scores

While achievement tests given as part of NELS were designed to measure what students learned in high school, no student was ever admitted to college based on NELS scores. The existence or nonexistence of a private school advantage in SAT scores is important, not because of what it indicates about what students learned in high school (since it is more an aptitude test than an achievement test) but because it indicates how well prepared they are to gain admittance into college.

For this reason, the study also analyzed the relationship between the input measures described above and the SAT scores reported in the NELS database for the target group of 1,003 students. The analysis revealed the SAT mathematics scores to be strongly related to student background measures. Prior 8th grade test scores were, by and large, positively related to SAT math scores, as was SES. Other parental measures, such as discussion and expectations, proved to be unrelated or even negatively related to SAT math scores. Among the types of schools, only one showed a private school advantage: independent schools.

A similar picture emerged when SAT verbal scores were analyzed. Prior test scores and SES were positively related to SAT scores, whereas other parental measures were not. Among the schools that were not comprehensive public high schools, the independent private schools and non-Catholic religious schools had an advantage, although for this latter group the advantage was substantially smaller (20 points on the test as opposed to 60 for the independent schools). Thus, although independent schools do not provide an edge in student knowledge of subject areas, they do appear to provide an edge in college preparation.

Outcomes at Age 26

This study also examined the NELS data from 2000, when the original participants were around age 26. In particular, the study sought to determine whether attending a private school gave young people an advantage in three types of post-high school outcomes: college attendance, civic-mindedness, and job satisfaction (the same outcomes analyzed in the NAIS study of public and private schools).

The study examined the outcome of completing some college because in the current job market, the lack of college education can be a major liability. As the research on educational attainment has shown previously, SES is a strong predictor of college attainment. The better educated the parents, the better educated the children. Of the various types of schools analyzed, only independent schools provided an advantage in students completing at least some college. That advantage, however, was quite modest compared to the impact of SES. The SES effect was five times as big as the independent school effect.

Research has also indicated that the higher a student's level of educational attainment, the higher his or her level of civic-mindedness (e.g. Persell & Wenglinsky, 2004). While there has been some investigation of high school classroom practices that affect student civic-mindedness, relatively little research has been done on the existence of a private school advantage. As with other outcomes, the NAIS study found an independent school advantage in civic-mindedness, but without taking into account prior achievement or student demographics. The CEP-commissioned study included a regression analysis that related private schooling to civic-mindedness eight years after graduation. The analysis took into account prior achievement—in this case, 12th grade achievement—as well as family characteristics. It also included SAT scores. While student achievement in history and civics was, as might be expected, a good predictor of the civic-mindedness of young adults, attending private school was not. These schools had no advantage over comprehensive public schools in preparing students to become civic-minded.

Finally, this study estimated the impact of private school attendance on job satisfaction. For this outcome, there proved to be no difference between comprehensive public schools and the other types of schools. Indeed, nothing had a positive effect, which suggests that either job satisfaction is poorly measured in this study or the inputs included are not good predictors of job satisfaction eight years down the line.

In summary, it appears that while private school effects exist in some circumstances, they are limited and inconsistent. In comparison, family characteristics appear repeatedly to influence student performance in high school and later life.

V. Conclusions

As described above, this study uncovered a variety of relationships between attendance at a particular type of school and specific outcomes. This concluding section pulls together these findings into a single model of private school effects.

Study Limitations

Before considering cumulative implications, one must recognize certain methodological shortcomings of the study. First, while the study does address the need for longitudinal achievement data, it does not address the need to understand family characteristics longitudinally. Just as it is possible in the NAEP research that private schools attract higher achieving students to begin with, it is possible in this study that private schools promote greater parental involvement. Because parental involvement was measured when students were in 10th grade, it may have been positively affected by private school attendance over the previous two years.

Second, other potential influences on student achievement and other educational outcomes were not included in the regression analyses—primarily because they were not available in NELS. The regression analyses indicated that much of the variation in the outcome variables remains unexplained; indeed, in the case of job satisfaction, the analyses pointed to virtually no explanations. It is possible that other factors, such as the instructional practices of teachers, are much bigger influences on student achievement than the factors included in this study.

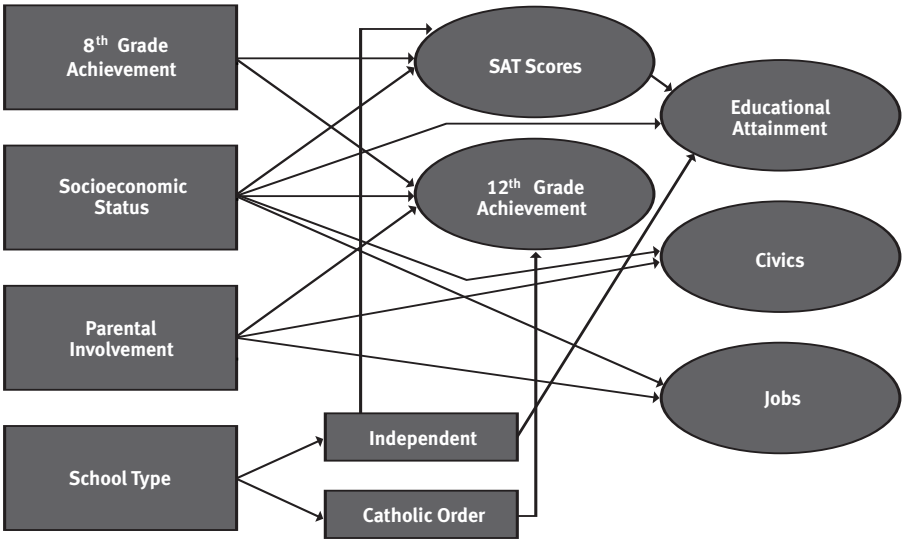
Third, many of the family variables are highly correlated with one another. While these correlations fall below the levels that would make the analyses problematic, they are still high enough that some family variables have small negative effects when others have large positive effects. Thus, while the regression analyses show the importance of including cultural capital variables, the relative effects of these variables remain to be teased out.

Factors Influencing High School Performance

All of the relationships identified in section IV can be conceptualized in three stages. As **figure 1** shows, the high school performance of adolescents is influenced primarily by three factors: their performance before they enter high school; the kinds of economic and resource advantages their parents can give them during high school, as reflected by their SES; and the involvement of their parents in school-related activities, including attitudes towards schooling and behaviors such as discussing schoolwork with children.

Figure 1 also shows a second stage in which, under certain circumstances, certain types of private schools influence student achievement or SAT scores. But this advantage is highly idiosyncratic. Only one type of school shows an advantage over comprehensive public high schools in student achievement across subjects: Catholic religious order schools. All told, attending these schools is a rarity; only 34 of the 1,003 students studied attended them, amounting to about one-quarter of the religious school population in the cities.

Figure 1. Factors Influencing Achievement and Other Outcomes



If students attend a religious school, they are much more likely to attend a Catholic school regulated by the diocese, or a Protestant, Jewish, or Muslim private school. And while this one type of school does consistently improve student performance, it does not positively influence the other outcomes studied here. There is no effect on SAT scores, educational attainment, civic-mindedness, or job satisfaction, except insofar as attending this type of school increases high school achievement.

One other private school advantage became clear, a kind of "special path" to high educational attainment. Independent private school students do not learn any more than other students as measured on achievement tests, but they do perform better on the SATs. This could mean that students in private schools tend to have higher IQs (aptitude tests are a better measure of IQ than achievement tests) or that private schools are better at honing students' test-taking skills (on which SAT scores are somewhat dependent). In either case, success on admissions tests has a longer-term consequence—a greater likelihood that students will attend and persist in college. (The validity of the SAT is based upon its ability to predict grades in the first year of college.)

Figure 1 also shows a third stage, in which high school success influences future outcomes. Students who leave high school with high levels of achievement are more likely to continue on to college. Also, students who perform well in subjects that support citizenship activities (such as history) will ultimately behave in a more civic-minded fashion eight years out. Finally, students who finish high school strong in math will enter the workforce more computer literate. In sum, high school success can have a substantial impact on future success.

The findings from this study also indicate that the family, in all of its dimensions, has a major influence on student achievement. Even among the study group of 1,003 low-income students, the slightly higher-income students performed better. The cultural capital of the

students also made a difference. Among low-income families, those with high educational expectations had children who were more likely to fulfill those expectations. And parents who took the time to discuss schoolwork with their children saw student achievement scores grow more rapidly in high school.

This study presents an answer to Coleman's studies of private school effects. Once the full scope of the family is taken into account, cultural capital as well as economic capital, private school effects disappear. These findings suggest a need to maintain the focus on improving schools while also bolstering supports for low-income families, such as providing adequate health care and preventive care, better wages, and high-quality child care and preschool programs. Although families do make a considerable difference, the good news is that concerned parents are not unique to any race, religion, geographic region, or social class, and there are as many of them in urban areas as suburban areas. But families need a combination of economic and social supports, as well as high-quality public education, to ensure that their children can take advantage of the social contract our society makes through the institution of public schools—to give every child a chance to rise higher than his or her parents.

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Appendix A: How the Study Was Conducted

Methodological Issues

The research question for this study was:

- When the full variety of student and family characteristics are taken into account, do private school students outperform public school students?

While prior research has attempted to address this question, this study represents a methodological advance over previous ones in that it addresses the following five issues:

1. *Longitudinal nature:* Most prior studies of private school effects are cross-sectional. The first Coleman study (1982) was a cross-sectional analysis of data from High School and Beyond, a nationally representative collection of data about high school sophomores and seniors conducted in 1980. The recent studies applying hierarchical linear modeling to results of the National Assessment of Educational Progress are also cross-sectional studies. The Lubienski and Lubienski (2005) study was a cross-sectional analysis of the 2003 NAEP 4th grade mathematics assessment. The Braun et al. (2006) study was a cross-sectional analysis of the 2003 NAEP 4th and 8th grade assessments in mathematics and reading. The second Coleman study (1987) was longitudinal, in that it used data from High School and Beyond in which sophomores from 1980 were followed to their senior year in 1982. But that database is only partially satisfactory for comparing the effects of private and public high schools, in that it only captures effects during the junior and senior years; nothing is known about students' achievement prior to entering high school. The National Educational Longitudinal Study was used for this study because it measures student achievement in 8th and 12th grades, thus covering all four years of high school.

2. *Multiple outcomes:* Certain educational outcomes, such as student achievement or dropping out, can be measured while students are of high school age. But other outcomes, such as college attendance or job satisfaction, are only measurable well after students graduate. Both High School and Beyond and NELS, because they are longitudinal, contain such information, although the results from NELS are much more valid since they cover all four years of high school. But NAEP, because it is cross-sectional, lacks these outcomes entirely. Thus, for a full assessment of long-term outcomes, only the second Coleman study or the CEP-commissioned study can be relied upon.

3. *Family characteristics:* All of the prior studies did control for socioeconomic status, but none took other aspects of families into account. NELS has a much richer set of family characteristics than either NAEP or High School and Beyond. It is crucial to include as wide a range of family characteristics as possible because research has found them to be commonly associated with educational outcomes and therefore a possible source of selection bias. In other words, without taking these characteristics into account, apparent private school effects might actually be attributable to private schools attracting more motivated parents. This is likely given that public school enrollment is the default setting for most school systems.

4. *Multiple school types:* None of the prior studies included all types of public and private schools in their analyses. The studies based upon High School and Beyond distinguished either between public and private schools, or among public, private Catholic, and other private schools. The studies based on NAEP made more nuanced distinctions among private schools but did not differentiate among types of public schools.

5. *Focus on urban schooling:* Many policy discussions about private school choice, including voucher plans, are focused on creating alternatives for students in urban school systems. The comparison between public and private schools means something different in suburban areas, where suburban public schools have many of the advantages of private schools. Including suburban schools might bias models away from private school advantages.

Sample

This study utilized the only nationally representative database that can currently address all of these issues, the National Educational Longitudinal Study of 1988-2000. This database first surveyed a nationally representative sample of students in 8th grade. It resurveyed the students in 10th and 12th grades (1990 and 1992), and again two years after graduation (1994) and eight years after graduation (2000). NELS assessed students' achievement three times, in grades 8, 10, and 12, in four subjects: reading, mathematics, science, and history. Parents were also surveyed when the students were in 8th and 12th grades; teachers were surveyed when the students were in 10th and 12th grades; and principals were surveyed when the students were in 8th, 10th, and 12th grades. In total, 13,626 students were surveyed for 8th, 10th, and 12th grades.

From this universe of students, the study pulled out a subset of students, consisting of all those who completed all five surveys, who lived in an urban area, and whose families ranked in the lowest socioeconomic quartile (as defined by an index in the 12th grade survey). This subset amounted to 1,003 students. By focusing on this subset, the study limited private school comparisons to those affecting inner-city populations (issue 5 above). Because the study used data from all four years of the NELS surveys, it addressed issue 1, and because it included NELS responses from the 2000 survey about participants' post-high school educational and employment experiences, it addressed issue 2. NELS also included a parent survey, which made it possible for the study to include a rich set of family characteristics (issue 3). And because NELS oversampled private school students, it was possible to distinguish between six types of private schools (issue 4). No type had fewer than 25 NELS survey participants for this analysis.

Variables

For these 1,003 students, the study measured the following independent variables:

- Eighth grade achievement in four subjects
- Socioeconomic status (a scale based upon the material possessions available in the home)

- Parental discussion of school work
- Parental expectations of their child's educational attainment
- Level of parental involvement in school activities
- Five types of private schools (Catholic diocesan, Catholic holy order, Catholic parish, non-Catholic religious, and independent)
- Three types of public schools (comprehensive, magnet, schools of choice)
- For post-high school analyses, 12th grade achievement in four subjects

The outcomes of interest were 12th grade achievement in four subjects, SAT scores (controlling for 12th grade achievement), students' attainment of at least some college, civic-mindedness eight years after high school, and job satisfaction eight years after high school.

Modeling Issues

The study sought to estimate separate Ordinary Least Squares (OLS) models for each of the outcomes using the following equation:

where
Y_i is the value of the educational outcome for student i
is the value of the intercept
is the impact of a school or student characteristic on the educational outcome
X_i is the value of that school or student characteristic for student i
is the unexplained variation in the educational outcome

These equations were estimated using OLS regression with weighting and design effect estimates. Because the sample is stratified and clustered, various sampled students had different probabilities of selection. The sampling weights were adjusted for these probabilities (such as the high probability of selecting a private school student). In addition, because students are clustered in schools, standard errors were multiplied by a design effect to adjust significance tests for the hierarchical nature of the data. (There are no school-level weights for the full five-wave panel; consequently, weights could not be created that would permit multilevel modeling. Jackknife or bootstrap-based design effects provide more accurate standard errors in such situations.)

In total, nine OLS regression models were estimated, one for each outcome. The standardized coefficients were used as the basis for comparing effect sizes, and a t-test at the .05 level was used for testing significance. These tests are one-tailed because the research question is interested in positive effects versus no effect/negative effects. The r-square was used to assess overall model fit. All model results are presented in appendix B. (Underlying means, standard deviations and correlations are available from the author upon request.)

Replication and Sensitivity Analyses

A series of analyses were performed on the same sample to test the assumptions of the models. Standard errors were adjusted for clustering; other non-school variables (e.g., peer demographics) were added to the models. Propensity score analyses were conducted to account for unobserved variables. The analyses produced the same basic results as the original analyses, thus indicating that the original models are not sensitive to the assumptions. For the outcomes replicated (academic achievement, SAT scores, and educational attainment), the only consistent school effects were for Catholic religious order schools. Full results from these analyses are available on the Web site of the Center on Education Policy, www.cep-dc.org.

Appendix B: Data Tables

Table B-1. 12th Grade Achievement

Variable	Reading	Mathematics	Science	Social Studies
Magnet school	.298	−1.197†	−.677†	.383†
	.356	.433	.225	.196
	.007	−.019	−.025	.016
Public school of choice	−.059	.168	.014	.239
	.224	.273	.142	.123
	−.002	.004	.001	.016
Catholic diocesan school	.331	.633	−.503	.172
	.438	.533	.277	.241
	.006	.008	−.015	.006
Catholic parish school	−.695	.050	−1.217	.838
	1.65	2.007	1.042	.908
	−.003	.001	−.009	.007
Catholic order school	1.518†	2.543†	.343	1.042†
	.474	.577	.299	.261
	.026	.031	.010	.034
Non-Catholic religious school	.635	−.301	−.349	−.132
	.544	.661	.343	.299
	.010	−.003	−.009	−.004
Independent secular school	.507	−.393	−.222	.243
	.450	.547	.284	.247
	.010	-.005	−.007	.009
8th grade reading	.518†	.115†	.057†	.107†
	.015	.018	.010	.008
	.443	.068	.079	.170
8th grade mathematics	.114†	.777†	.145†	.055†
	.011	.013	.007	.006
	.136	.640	.279	.123
8th grade science	.180†	.246†	.400†	.173†
	.028	.033	.017	.015
	.087	.082	.311	.155
8th grade history	.372†	.194†	.213†	.427†
	.029	.035	.018	.016
	.169	.061	.156	.362
Socioeconomic status	.048	.246†	.118†	.096†
	.026	.032	.017	.014
	.018	.065	.072	.068
Parental discussion	.188†	.047	−.066	−.040
	.059	.072	.037	.033
	.027	.005	−.016	−.011

Table B-1 continued

Variable	Reading	Mathematics	Science	Social Studies
Parental involvement	−.138	−.112	.044	−.084*
	.071	.087	.045	.039
	−.017	−.009	.008	−.019
Parental expectations	.311*	.613†	−.126	.219†
	.123	.150	.078	.068
	.022	.030	−.014	.029
R-squared	.618	.729	.600	.596

*p<.05

†p<.01

Note: Cells contain unstandardized coefficients, standard errors, and standardized coefficients, in that order.

Table B-2. SAT Scores

Variable	Mathematics	Verbal
Magnet school	4.986	.999
	5.403	5.713
	.009	.002
Public school of choice	−2.980	−.779
	3.408	3.604
	-.009	−.003
Catholic diocesan school	−53.146†	−38.891†
	6.457	6.828
	-.083	−.067
Catholic parish school	−122.018†	−107.904†
	24.977	26.412
	−.049	−.047
Catholic order school	−8.235	4.648
	7.025	7.429
	−.012	.007
Non-Catholic religious school	3.909	21.578*
	8.035	8.497
	.005	.030
Independent secular school	42.580†	63.808†
	6.517	6.891
	.068	.112
12th grade reading	−2.139†	3.965†
	.217	.229
	−.175	.355

Table B-2 continued

Variable	Mathematics	Verbal
12th grade mathematics	7.27†	1.264†
	.158	.167
	.838	.159
12th grade science	3.262†	1.974†
	.375	.397
	.162	.107
12th grade history	−.554	4.448†
	.413	.436
	−.024	.207
Socioeconomic status	2.984†	2.746†
	.395	.417
	.094	.095
Parental discussion	−7.979†	−2.311†
	.897	1.979
	−.097	−.015
Parental involvement	−3.609†	−.837
	1.084	1.146
	−.036	−.009
Parental expectations	.632	−2.311
	1.871	1.979
	.004	−.015
R-squared	.747	.661

*p<.05

†p<.01

Note: Cells contain unstandardized coefficients, standard errors, and standardized coefficients, in that order.

Table B-3. Long-Term Outcomes

Variable	Civic-Mindedness	Goes on to College	Job Satisfaction
Magnet school	−.023	.028	−.159
	.107	.029	.187
	-.004	.016	−.017
School of choice	.037	.003	−.027
	.068	.018	.118
	.010	.003	−.005
Catholic diocesan school	−.134	−.109†	−.086
	.131	.035	.227
	−.020	−.051	−.008
Catholic parish school	−.600	−.225	−.903
	.498	.134	.866
	−.023	−.027	−.021

Table B-3 continued

Variable	Civic-Mindedness	Goes on to College	Job Satisfaction
Catholic order school	−.001	−.011	.230
	.140	.038	.243
	.001	−.005	.019
Non-Catholic religious school	.103	.019	.192
	.160	.043	.277
	.012	.007	.014
Independent secular school	.238	.113†	−.051
	.132	.035	.229
	.036	.054	−.005
SAT math	−.003†	−.002†	.001
	.001	.001	.001
	−.294	−.662	.062
SAT verbal	−.001	−.001	−.001
	.001	.001	.001
	−.030	−.213†	−.053
12th grade reading	−.005	.002	−.011
	.005	.001	.008
	−.041	.041	.083
12th grade math	.023†	.025†	.012
	.005	.001	.008
	.267	.881	.083
12th grade science	−.002	−.002	.001
	.007	.002	.013
	−.008	−.032	.004
12th grade history	.040†	.010†	−.003
	.008	.002	.014
	.169	.127	-.008
Socioeconomic status	.035†	.023†	.001
	.008	.002	.014
	.106	.214	.001
Parental discussion	.056†	-.002	.045
	.018	.005	.031
	.065	-.009	.032
Parental involvement	.101†	.005	.032
	.022	.006	.038
	.095	.016	.018
Parental expectations	.076*	.053†	−.134
	.037	.010	.065
	.042	.093	−.045
R-square	.105	.358	.005

*p<.05

†p<.01

Note: Cells contain unstandardized coefficients, standard errors, and standardized coefficients, in that order.

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