53. Michael Cook and William Evans, "Families or Schools? Explaining the Convergence in White and Black Academic Performance," *Journal of Labor Economics*, vol. 18, no. 4 (October 2000), pp. 729–54, in a careful decomposition of the narrowing of the black-white National Assessment of Educational Progress test score gap between 1970 and 1988, find that at least three quarters of the reduction in the gap occurred within schools and no more than one quarter occurred because of relative changes in parental education. The fact that black students appear to benefit more from smaller classes than white students—combined with the general decline in class size—could account for the large within-school effect that they find.

54. Boozer, Krueger, and Wolkon, "Race and School Quality since *Brown v. Board of Education.*"

3

Voucher Programs and the Effect of Ethnicity on Test Scores

PAUL E. PETERSON AND WILLIAM G. HOWELL

Just ten years ago, the only data available related to school vouchers came from a flawed public choice program conducted during the 1960s in Alum Rock, California. But the early and mid-1990s brought new privately and publicly funded voucher programs to cities such as Cleveland, Ohio; Dayton, Ohio; Indianapolis, Indiana; Milwaukee, Wisconsin; New York City; San Antonio, Texas; and Washington, D.C.[1] With them came a wealth of new research opportunities.

Three privately funded voucher programs were particularly advantageous. The programs in Dayton, New York City, and the District of Columbia awarded vouchers by lottery, thus creating ideal conditions for a randomized field trial. Before the lotteries were conducted, our evaluation team collected data on student test scores and family background characteristics. As of mid-2000, students had been reevaluated one and two years later. Because the abilities and family backgrounds of the test and control groups were, on average, similar before they entered the lottery, subsequent differences observed between the lottery winners and losers may be attributed to the effects of a voucher. Because of their design, our evaluations of the Dayton, New York City, and Washington, D.C., voucher programs have yielded the best available information on students' test score outcomes and parental assessments of public and private schools.

Elsewhere in 2000 we, with our colleagues, reported the impact of vouch-

ers on student test score performance in all three cities, finding positive effects of vouchers on African American test scores but no effects on the test scores of students from other ethnic backgrounds.[2] In this paper we summarize these findings, then examine parental responses in New York City to try to explain why vouchers seem to have differential effects depending on the students' ethnic background.

Prior Research

The first indication that private school effects are concentrated among African American students came from the High School and Beyond data collected by the U.S. Department of Education in 1980 and 1982. By surveying and testing a national sample of public and private schools in two waves, the Department of Education generated data on the determinants of academic gains in high school between a student's sophomore and senior years. In a 1985 issue of *Sociology of Education,* three particularly trenchant essays analyzed and interpreted the data.[3]

The authors of these essays noted serious disagreements about aggregate private school impacts. Thomas Hoffer, Andrew Greeley, and James Coleman found substantial, positive private school effects on student test performance, while Douglas Wilms found trivial effects, if any. Christopher Jencks mediated the conflict, reaching judicious conclusions somewhere in the middle.

Few observers, however, noticed in the *Sociology of Education* disputation the discussion of the effects of private schools on minority students. Hoffer, Greeley, and Coleman found especially strong positive effects on low-income, minority students, whose test scores increased by 4.4 answers, as compared to 1.6 answers for students generally.[4] Jencks showed that Wilms's data, despite their exclusion of dropouts, also contained positive (though not statistically significant) effects of attending a Catholic school on African Americans' reading scores. Taking all of the evidence from both studies into account, Jencks concluded that "the evidence that Catholic schools are especially helpful for initially disadvantaged students is quite suggestive, though not conclusive."[5] While overall impacts remained contested, those on minorities appeared more robust.

Subsequent studies tended to reaffirm Hoffer, Greeley, and Coleman's findings. In an analysis of the National Longitudinal Survey of Youth, Derek Neal concluded that students who attend Catholic schools are more likely to graduate from high school and college. The effects, Neal noted, are the greatest among urban minorities. Catholic schools also have a significant, positive effect on black earnings potential, but not whites'.[6] In separate studies, David

Figlio and Joseph Stone and William N. Evans and Robert M. Schwab generated consistent findings for African Americans.[7]

Because they draw upon national data sets, all of these studies are of particular interest. One cannot rule out the possibility, however, that the observed positive effects were due to selection bias, a problem that arises when a population differentiates itself by freely choosing a treatment—in this case, attending a private school. This problem may be serious if those families with children in private schools looked very different from those with children remaining in public schools. Most of these studies adjusted for observable family background characteristics, such as mother's education, family income, and other demographic factors. Still, one cannot be sure that the adjustments adequately account for an intangible factor—the willingness of a family to pay for their child's tuition, and all that this implies about the importance it places on education. Others performed two-stage regression models that reduce potential selection bias. But as the disagreements between Neal and Figlio and Stone attest to, instrumental variables that are correlated with the type of school students attended but unrelated to the error term in the second-stage equation are sparse.

The best solution to the self-selection problem is the random assignment of students to test and control groups. Until recently, most evaluations of voucher programs have not utilized a random-assignment research design and therefore cannot rule out possible selection problems. Privately funded programs in Indianapolis and San Antonio admitted students on a first-come, first-served basis. And in the state-funded program in Cleveland, though scholarship winners were initially selected by means of a lottery, eventually all applicants were offered a scholarship, thereby precluding the conduct of a randomized experiment. The public Milwaukee program did award vouchers by a lottery, but data collection was incomplete.[8]

As a consequence, the programs in Dayton, New York, and Washington, D.C., provide unique opportunities to examine the effects of school vouchers on students from low-income families who live in central cities. In contrast to prior studies, the evaluation team conducted the lotteries in all three cities. Follow-up test score information was obtained from about one-half to two-thirds of the students who participated in the lottery, and baseline data provided information that allowed the analysts to adjust for nonresponse.

The Programs

In several key respects, the three voucher programs followed similar designs. All were privately funded; all were targeted at students from low-income fam-

ilies, most of whom lived in the inner city; all provided only partial vouchers that the families were expected to supplement; and all of the students in the evaluations of these three programs previously had been attending public schools.

In the spring of 1998, Parents Advancing Choice in Education (PACE) offered low-income students in grades K–12 the opportunity to win a scholarship to attend private school in Dayton, Ohio. For the 1998–99 school year, PACE offered scholarships to 515 students who were in public schools and to 250 who were already enrolled in private schools in the Dayton metropolitan area. During the program's first year, the PACE scholarships covered 50 percent of tuition at a private school, up to $1,200. Support was guaranteed for at least four years, with a possibility of continuing through high school, provided funds remained available. Of those students offered scholarships, 51 percent enrolled in a private school during the second year of the program.[9]

The School Choice Scholarships Foundation (SCSF) in New York City offered thirteen hundred scholarships worth up to $1,400 annually toward tuition at a private school for at least three years. To qualify for a scholarship, children had to be entering grades one through four, live in New York City, attend a public school at the time of application, and come from families with incomes low enough to qualify for the U.S. government's free school lunch program. More than twenty thousand students applied between February and late April 1997. By the end of the scholarship program's second year, 74 percent of the lottery-winning students were attending a private school.

The Washington Scholarship Fund (WSF), established in 1993, is the oldest of the three programs. By the fall of 1997, the WSF was serving approximately 460 children at twenty-two private schools. After receiving a large infusion of new funds from two philanthropists, the WSF announced a major expansion in October 1997.

To qualify, applicants had to reside in Washington, D.C., and be entering grades K–8 in the fall of 1998. Families with incomes at or below the poverty line received vouchers that equaled 60 percent of tuition, or $1,700, whichever was less. Families with incomes above the poverty line received smaller scholarships. Families with incomes higher than two-and-a-half times the poverty line were ineligible. The WSF claims that it will maintain tuition support for at least three years and, if funds remain available, until students complete high school. In April 1998, the WSF awarded more than one thousand scholarships by lottery, with the majority going to students previously attending a public school. Of those students offered scholarships, 48 percent were still using them to attend a private school in the second year of the program.

Evaluation Procedures

The evaluation procedures used in all three studies conform to those in randomized field trials. Our evaluation team collected baseline test score and family background information before the lottery, administered the lottery, and collected follow-up information one and two years later.

Students took the Iowa Test of Basic Skills (ITBS) in reading and mathematics. Students who were entering grades one through four in New York City and grades two through eight in Dayton (and other parts of Montgomery County, Ohio) and Washington, D.C., were included in the evaluations. Parents filled out surveys on their satisfaction with their children's schools, their involvement in their children's education, and their demographic characteristics. Students in grades four and higher completed similar surveys. In all three cities, the follow-up procedures replicated the pre-lottery procedures: students again took the ITBS in reading and math; parents and older students filled out surveys regarding their backgrounds and educational experiences.

In Dayton, 1,440 students were tested pre-lottery, 803 of whom were attending public schools at the time. More than five thousand students participated in pre-lottery testing in New York City. Of the students who did not win the lottery, approximately one thousand were selected at random to compose a control group representing approximately 960 families. All of these students were attending public schools at the time. In Washington, D.C., 2,023 students were tested pre-lottery, of whom 1,582 were attending a public school. Because only public school children were eligible to apply for a scholarship in New York, separate public and private lotteries did not have to be held there. Separate lotteries were held in Dayton and Washington for students who were enrolled in public and private schools. Only those students who were in public schools at the time of the lotteries are included in this study.

In Dayton, 47 percent of the students participating in the second year of the evaluation were African Americans; in New York City, 42 percent; and in Washington, 94 percent. Hispanic students accounted for 2 percent of the Dayton population, 51 percent of New York City's, and 4 percent of Washington's. Whites accounted for 24 percent of Dayton's evaluation group, versus 5 percent in New York City and 1 percent in Washington. The remaining students came from a variety of other ethnic backgrounds.

In Dayton, 56 percent of the students included in the evaluation attended the first-year testing sessions; 49 percent attended the second-year sessions. In New York City, 82 percent of families attended follow-up sessions after

one year, and 66 percent after two years. In Washington, the response rate after one year was 63 percent; after two years, 50 percent.

We are reasonably confident that these modest response rates do not undermine the integrity of our findings. First, with the exception of the second year in New York, response rates were similar for treatment and control groups after one and two years in all three cities. Second, comparisons of baseline test scores and background characteristics revealed only minor differences between the second-year respondents and nonrespondents in all three cities. Finally, to account for the minor differences between respondents and nonrespondents that we did observe, the test scores of children who, based on their demographic characteristics, were more likely to attend follow-up sessions were weighted less heavily, while the test scores of children who were less likely to attend follow-up sessions, but nevertheless did, were weighted more heavily. Given the slight differences between respondents and nonrespondents, however, the weights do not change the results substantially.

The randomized lottery ensured that lottery winners as a group were not significantly different from the control group (those who did not win a scholarship). In all three cities, the demographic characteristics and pre-lottery test scores of scholarship winners and losers (the treatment and control groups, respectively) were identical to one another. Only in Dayton were minor differences in the pre-lottery test scores observed: those offered a voucher scored 6.5 percentile points lower in math and 3.1 points lower in reading than those not offered a scholarship, a statistically significant difference.

To measure the impact on children's test scores of switching to a private school, we estimated a statistical model that takes into account whether a child attended a public or private school, as well as baseline reading and math test scores. Baseline test scores were included to adjust for the minor baseline differences between the treatment and control groups on the achievement tests and to increase the precision of the estimated impacts of switching from a public to a private school.

The lottery generated two groups: those who were offered a voucher and those who were not. In this paper, we are less interested in the effect of being offered a voucher than the effect of using a voucher to attend a private school. A simple comparison between public and private school students, however, is inappropriate because certain students may be more likely to take advantage of a voucher offered them. Their parents might place greater value on education, have greater resources to supplement the voucher, or may live in a neighborhood with a broader selection of private schools. If these children differ from students who won a voucher but failed to use it in ways that are related to student achievement, it could bias our findings.

To solve this problem, we performed a two-stage regression model. In the first stage of the model, we predicted the probability that each individual would attend a private school based upon whether or not he or she was offered a voucher. With these predicted values, we then recovered estimates of the impact of switching from a public to a private school. This two-stage technique was first used in medical research and is now commonplace in econometric studies of educational interventions.[10]

Test Score Results

This chapter reports the impacts of vouchers on student test scores after one and two years in Dayton, New York City, and Washington. Impacts are different from levels or trends. Levels refer to the absolute standards at which students perform at a given time; trends refer to changes in levels experienced by a single group over time. Impacts, by contrast, refer to the differences in test scores between those students who received treatment and those who did not. Consequently, positive impacts imply that those who attended a private school scored higher than comparable students who remained in public schools; and negative impacts suggest that members of the treatment group scored lower than they otherwise would have.

Our findings varied systematically according to the student's ethnicity. In all three cities, no significant differences were found between the test score performance of non–African American students who switched from a public to a private school and the performance of students in the control group—either after one or two years (see table 3-1).[11] For African American students, however, vouchers made a substantial difference. In the three cities combined, African American students who switched from public to private schools scored, after one year, 3.9 percentile points higher on the combined math and reading tests (expressed as national percentile ranking [NPR] points, which run from 0 to 100 with a national median of 50). After two years, African American students who used a voucher to enroll in a private school scored 6.3 percentile points higher than their public school peers.

The data in table 3-1 also show that the largest voucher impacts for African American students were observed in the Washington, D.C., program. African American students who attended D.C. private schools for two years scored 9.2 percentile points higher than students in the control group. The smallest differences after two years were observed in New York City, where African American students attending private schools scored 4.3 percentile points higher than the control group. In Dayton, the difference between test and control groups was 6.5 percentile points.

Table 3-1. *Impact of Switching to a Private School on Test Score Performance*

	Year one		Year two	
Ethnic group	Percentile	Number	Percentile	Number
African Americans				
Dayton, Ohio	3.3	296	6.5*	273
New York City	5.4***	622	4.3**	497
Washington, D.C.	–0.9	891	9.2***	668
Average private school impact	3.9*		6.3***	
All others				
Dayton, Ohio	1.0	108	–0.2	96
New York City	–2.2	812	–1.5	699
Washington, D.C.	7.4	39	–0.1	42
Average private school impact	–1.0		–1.4	

* Significant at the 0.10 level on a two-tailed test.
** Significant at the 0.05 level on a two-tailed test.
*** Significant at the 0.01 level on a two-tailed test.

Note: Weighted two-stage least squares regressions performed; treatment status used as instrument. Impacts expressed in terms of national percentile rankings. In Dayton, 2.0 percent of the African American control group in the year-two models attended a private school in the second but not the first year; in New York City, 2.8 percent of the African American control group in the year-two models attended a private school for one of two years; and in Washington, D.C., 3.7 percent of the African American control group in the year-two models attended a private school in the second year but not the first year.

The average impact of vouchers on the test scores of African Americans was moderately large. After one year, black students who switched to private schools scored 0.18 of a standard deviation higher than the students in the control group. After two years, the difference grew to 0.28 of a standard deviation, roughly one-third of the test score gap between blacks and whites.

The magnitude of the effects can be further assessed by comparing them to those effects observed in an evaluation of a class-size reduction intervention conducted in Tennessee, the only other major education reform to be evaluated with a randomized field trial. The effects on African Americans of attendance at a private school shown here are comparable to the estimated effect of a seven-student reduction in class size. According to a recent reanalysis of data from Tennessee, the class-size reduction effect for African Americans after two years was, on average, between 7.9 and 8.6 percentile points, slightly higher than the 6.3 percentile effect of switching to a private school.[12]

The size of the effects of the voucher intervention can also be compared with the size of the effects reported in the RAND study entitled *Improving*

School Achievement released in August 2000.[13] Identifying the most successful states, North Carolina and Texas, which have introduced rigorous accountability systems that involve statewide testing, the study finds what it says are "remarkable" one-year gains [in math scores] of "as much as 0.06 to 0.07 standard deviation per year"—or 0.12 to 0.14 over two years. The two-year effects of the school voucher intervention on African American students observed here are roughly twice as large.

Controlling for Demographics

Most research on the impact of private schools attempts to control for differences in family income and other background characteristics among students attending public and private schools. When a lottery is used to separate research subjects into experimental and control groups, however, such statistical adjustments are generally unnecessary, given that the two groups being compared are virtually identical to one another.

Nonetheless, a number of analysts have expressed concern at the apparent absence of controls for family background characteristics. Bruce Fuller and his colleagues at the University of California at Berkeley, for instance, argued that "the experimental group may have been biased as some of the most disadvantaged voucher winners did not switch to a private school, and therefore were excluded from the group (possibly boosting mean achievement levels artificially)."[14] An interest group, People for the American Way, lodged a similar complaint: "The . . . study's key finding improperly compares two dramatically different groups and may well reflect private-school screening-out of the most at-risk students."[15]

In the three cities, approximately half the students took the voucher that was offered to them (the takers) and about half did not (the decliners). However, the decliners remained a part of the evaluation, contrary to the suggestions made by Fuller and by People for the American Way. All those offered a voucher and all members of the control group were invited to follow-up testing sessions, and all the participating students are included in the analysis. The analysis does not provide a simple, raw comparison between those who took the voucher and the members of the control group who did not win the lottery. Instead, as previously discussed, the fact that the vouchers were awarded randomly is used to create an instrumental variable that permits one to recover a consistent estimate of the effect of switching to a private school.

Given this analytical strategy, results are unlikely to vary, if one controls for family background characteristics. The use of a randomized lottery ensures that the background characteristics of lottery winners and losers will not differ significantly. To show this, we recalculate the impact of attending a

private school on test scores, this time including explicit controls for the mother's educational level, her employment status, family size, and whether the family received welfare. As expected, the difference in combined reading and math test scores of African Americans after two years in all three cities remains exactly the same—6.3 NPR points, a statistically significant impact.

The Sore Loser Hypothesis

Since releasing our study in 2000, some have suggested that the observed differences between public and private school parents may be due to the frustrations of members of the control group. *New York Times* columnist Richard Rothstein, for example, iterates a hypothesis first made by Stanford University professor Martin Carnoy:

> Volunteers for vouchers . . . may have their hopes raised, then dashed when they were not selected for a voucher. Sorely disappointed, they may then demand less of their children in public school.[16]

To explore this hypothesis, we examined the control group's satisfaction levels at baseline, after one year, and after two years. On each of these occasions, parents were asked: "How satisfied are you with the following aspects of your child's current school?" Items included teaching, school safety, parental involvement, class size, school facility, student respect for teachers, communication regarding student progress, freedom to observe religious traditions, and the school's location.[17] Parents then were given four response options, "very satisfied," "satisfied," "dissatisfied," and "very dissatisfied." Indexes of satisfaction were constructed from all individual satisfaction items and range from 1 ("very dissatisfied") to 4 ("very satisfied"). The results presented here come from New York City.

In all cases, those not receiving the voucher reported slightly higher levels of satisfaction one year after having been denied a scholarship than at baseline. At baseline, members of the control group scored, on average, 2.7 on the satisfaction scale; one year later, they scored 2.8; and then after two years, 2.7. Overall, no evidence shows that upon learning that children of members of the control group had not won a voucher, satisfaction rates among the parents declined significantly.

Parental responses to questions about their relationships with their children cast further doubt on the hypothesis that the frustration associated with losing the voucher lottery lead control-group parents to care less about the education of their children. Parents were asked how often they helped their child with homework, talked with their child about school, attended school

Table 3-2. *Impacts of Switching to a Private School on Measures of Parental Involvement of African Americans and Latinos in New York City*

Parental involvement	African Americans		Latinos		Difference in impacts
	Percentile	Number	Percentile	Number	
With child's education					
Year-one impact	−0.04	531	−0.11	568	—
Year-two impact	−0.06	470	−0.15	529	—
With child's school					
Year-one impact	−0.15	518	0.04	553	—
Year-two impact	−0.23*	470	−0.08	529	—

 * Significant at the 0.10 level on a two-tailed test.
 — Not statistically significant.
 Note: The last column denotes whether the difference in the estimated impacts for African Americans and Latinos is statistically significant. Weighted two-stage least squares regressions performed; treatment status used as instrument. All models control for lottery indicators. Impacts expressed in terms of effect sizes.

activities, and worked on school projects. In every case, the answers given by parents with children in the public school control group after both one and two years remained roughly constant, and they closely resembled the responses of parents in the treatment group (see table 3-2).[18]

These data lend little support for the claim that control-group parents were sore losers. Given that parents knew their children had only about a one in twenty chance of winning the lottery, their initial expectations probably were not unduly high. It is hard to imagine, then, that whatever disappointment parents felt when their children lost the lottery led to their children's systematic underachievement when tested one and two years later.

Hawthorne Effects

As a corollary to the sore loser hypothesis, Carnoy suggested that our findings might represent Hawthorne effects. If so, then the observed gains for African Americans may have little to do with vouchers per se, but rather the surge of enthusiasm associated with winning a lottery. Upon learning that their children could now attend a private school, the interest and involvement of treatment-group parents in their children's education may have been reinvigorated. A year later, such enthusiasm might wane and children could lose the family support they need to excel academically.

To ascertain whether Hawthorne effects explain the pattern of results, we revisited our measures of parental satisfaction, again focusing on New York

Table 3-3. *Impacts of Switching to a Private School on Measures of Satisfaction for African Americans and Latinos in New York City*

Satisfaction index	African Americans		Latinos		Difference in impacts
	Percentile	Number	Percentile	Number	
Year-one impact	1.18***	533	0.99***	567	**
Year-two impact	1.00***	466	1.12***	529	—

** Significant at the 0.05 level on a two-tailed test.

*** Significant at the 0.01 level on a two-tailed test.

— Not statistically significant.

Note: The last column denotes whether the difference in the estimated impacts for African Americans and Latinos is statistically significant. Weighted two-stage least squares regressions performed; treatment status used as instrument. All models control for lottery indicators. Impacts expressed in terms of effect sizes.

City. The parental satisfaction indexes were standardized to have a standard deviation of 1.0.

When comparing the impact of attending a private school on parental satisfaction in years one and two, we find some support for the Hawthorne hypothesis. The effect size of attending a private school on the parental satisfaction of African Americans in year one was fully 1.2 standard deviations (see table 3-3). The effect size attenuates somewhat in year two, dropping to 1.0 standard deviation.

Other facts, however, cast doubt on Carnoy's intuition. First, the impact of attending a private school on parental satisfaction remains very large in both years one and two. Even after two years, the effect size for parental satisfaction hovers around a full standard deviation. The 0.2 diminution of satisfaction among African American parents that occurred between year one and year two was modest when compared with the striking differences in satisfaction with private and public schools that remained after two years.

Second, the impacts on satisfaction rates of Latino and African American parents were comparable in year one, and by year two the impact for Latinos was slightly higher. If all it takes to elevate test scores is to enhance parental satisfaction with a school, then why haven't Latinos posted significant test score gains?

Finally, while they may inform parental satisfaction rates, Hawthorne effects are less likely to drive student achievement. Students participating in voucher experiments are being asked to change schools, form new friendships, adjust to new rules and expectations, and acquire new study habits. In Washington, D.C., for instance, older students who transferred to private schools indicated intense resentment with these changes, which in turn was

reflected in their first-year test scores.[19] Instead of leveling off, then, observed impacts may increase as students have a greater amount of time to adjust to their new schools and the educational expectations laid upon them.

Explaining Ethnic Differences in Voucher Impacts

Neither the absence of background controls, nor the disappointment of losing a voucher, nor Hawthorne effects appear to explain away the observed gains for African Americans, at least after two years. An important puzzle, therefore, arises. Why should vouchers have a positive impact on the test scores of African American students, but not anybody else? This finding is particularly curious in New York, where African American students posted positive and significant test score gains, but Latinos did not. As poor, minority residents of inner cities, both groups presumably face a common set of educational obstacles. One would think, then, that an intervention that successfully improves the test scores of one group would have a similar impact on the other.

The remainder of this chapter draws upon parental survey data from New York City to assess a broad array of possible explanations for the observed differential race effects: language, school disruptions, class size, school size, parental communications, and a kitchen-sink model that simultaneously controls for a multiplicity of factors. We first test the impact of vouchers for African Americans and Latinos on each of these aspects of a student's education. Using these results, we then select a subset of factors to include in the original test score models to see whether or not they reduce the positive effect of vouchers experienced by African Americans. Unfortunately, they do not, either singularly or additively. Ultimately, and perhaps unfortunately, we are better able to rule out possible explanations than draw positive conclusions.

Language Needs

The fact that African Americans appear to benefit from vouchers, but Latinos do not, may have nothing to do with race per se, and everything to do with language. Private schools may be poorly equipped to deal with students who do not speak English as their primary language; public schools, meanwhile, often have well-established English as a Second Language (ESL) programs and specially trained personnel to deal with the particular cultural and linguistic needs of minority populations. The gains associated with a private education may transfer only to those students who can function in all-English classrooms.

Table 3-4. *Impact of Switching to a Private School on Test Score Performance in New York for Latinos Who Speak English as a Primary and Secondary Language*

	English primary		English secondary	
Impact	Percentile	Number	Percentile	Number
Year one	–2.6	399	2.3	305
Year two	–1.6	342	3.1	290

Note: Weighted two-stage least squares regressions performed; treatment status used as instrument. All models control for baseline test scores and lottery indicators. In no year are the estimated impacts for the two groups of Latinos statistically significantly different from one another.

To test this hypothesis, we compared the impact of switching to a private school on the test scores of Latino students whose primary language (according to their parents) was English with the impact on those for whom English was a secondary language. As can be seen in table 3-4, the results, if anything, run directly contrary to expectation. Non–English speaking Latinos post slightly positive impacts, while Latinos for whom English is the primary language post slightly negative effects. Neither the positive nor negative impacts, nor the slightly larger differences in impacts, are statistically significant.

These findings do not provide much of a basis on which to judge the ways in which public and private schools deal with students with language needs. They probably rule out language, however, as an explanation for why African Americans appear to benefit from vouchers, while Latinos do not.

Parental Perceptions of Public and Private Schools

Parents accompanied children to follow-up testing sessions. Because the testing took over an hour, parents had time to complete fairly lengthy questionnaires about the schools their children were attending. In previous papers, we reported the results from these surveys for all parents regardless of their ethnic background.[20] These results provide information concerning the impact of switching to a private school on parental perceptions of numerous aspects of school life. Generally speaking, in Dayton, New York, and Washington, D.C., we found that

—Private schools have stricter dress codes.

—Hallways in public schools are more closely monitored—students are more likely to need passes to leave the classroom and visitors are more likely to have to get permission slips.

—School disruptions—fighting, cheating, property disruption, student misbehavior, truancy, tardiness, and so forth—are more extensive in public schools.

—Suspension rates are similar in the two sectors.

—Public schools have more physical resources—cafeteria, nurse's office, gymnasium, and so forth.

—Public schools have a greater variety of academic programs—special education, advanced education, bilingual education, and so forth.

—Private schools communicate more with parents by means of teacher-parent conferences, parental participation in school, and so forth.

—Students in private schools do more homework.

—Private schools have fewer students and smaller classes.

—Although results differ from city to city, on the whole the degree of segregation is similar in the two education sectors.

—Parents in both sectors are equally involved in their child's education.

—Parents in both sectors volunteer and participate equally in their child's school.

The observed impacts of vouchers on some of these school characteristics may vary for different ethnic groups, and therefore may explain why African Americans appear to benefit from vouchers, while Latinos do not. To explore this possibility, we estimated the impact of attending a private school in New York City separately for African Americans and Latinos.

Some aspects of school life—class size, school size, amount of time spent on homework, degree of ethnic segregation, and suspension rates—could be easily measured by using responses parents gave to a single question. When possible, though, we constructed indexes from multiple survey questions that measured the same school characteristic. Appendix 3A reports questions used to generate each index.

We estimated the impact of switching to a private school on each aspect of school life in the same way that we estimated the impacts on test scores, except that we did not control for baseline test scores. The results of this investigation are reported in table 3-5; for parental involvement items, see table 3-2.

For African Americans, the impacts of switching to a private school on parental perceptions of most aspects of school life were fairly stable from the first to the second year. In both years, African American parents with children in private schools reported significantly fewer school disruptions (fighting, cheating, property destruction, and so forth) than parents with children in public schools. They also reported significantly more demanding dress codes, less hallway monitoring, fewer school resources, greater parental communication with the school, more homework, smaller schools, and slightly less involvement in school activities (though this final difference is statistically significant only in year two). In year one, African American parents

Table 3-5. *Impacts of Switching to a Private School on Characteristics of Schools Attended by African Americans and Latinos in New York City*

Characteristic	African Americans		Latinos		Difference in impacts
	Percentile	Number	Percentile	Number	
School disruptions					
Year-one impact	−0.46***	524	−0.02	564	**
Year-two impact	−0.27**	465	−0.16	523	—
Suspensions					
Year-one impact	0.01	514	−0.13	547	—
Year-two impact	0.02	463	0.09	526	—
Dress rules					
Year-one impact	1.47***	525	1.30***	559	**
Year-two impact	1.06***	461	0.90***	512	—
Hallway monitors					
Year-one impact	−0.62***	516	−0.55***	556	—
Year-two impact	−0.67***	464	−0.10	519	***
School facilities					
Year-one impact	−0.24*	529	−0.15	567	—
Year-two impact	−0.49***	468	−0.08	526	**
School programs					
Year-one impact	0.22*	527	0.05	564	—
Year-two impact	−0.16	462	−0.04	522	—
School communication with parents					
Year-one impact	0.71***	532	0.30**	564	***
Year-two impact	0.78***	469	0.43***	528	**
Amount of homework					
Year-one impact	0.64***	527	0.49***	565	—
Year-two impact	0.48***	470	0.33**	527	—
Class size					
Year-one impact	−0.61***	515	−0.04	540	***
Year-two impact	−0.21	460	0.01	512	—
School size					
Year-one impact	−0.88***	366	−0.47***	364	**
Year-two impact	−0.82***	353	−0.54***	408	*
Racial segregation					
Year-one impact	−0.02	517	−0.07	553	—
Year-two impact	−0.16	457	−0.11*	513	—

* Significant at the 0.10 level on a two-tailed test.
** Significant at the 0.05 level on a two-tailed test.
*** Significant at the 0.01 level on a two-tailed test.
— Not statistically significant.
Note: The last column denotes whether the difference in the estimated impacts for African Americans and Latinos is statistically significant. Weighted two-stage least squares regressions performed; treatment status used as instrument. All models control for lottery indicators. Impacts expressed in terms of effect sizes.

with children in private schools reported that their child was in a significantly smaller class, but not in year two. African American parents with children in private schools, as compared with those in public schools, also reported no differences in suspension rates, in their involvement with their child's education, in the likelihood that their child attended a segregated school, and the number of specific programs (bilingual education, special education, advanced education, and so forth) at their child's school.

In some respects, the results for Latino parents revealed similar trends. Latino parents with children in private schools reported stricter dress codes, more communication with their schools, more homework, and smaller schools. They also reported no difference between the two sectors in suspension rates, the range of school programs, and their own involvement with their child's education.

In several other respects, however, school vouchers appeared to have very different effects on the education of Latino students. Latino parents whose children attended private schools, for instance, did not report a reduction in the number of school disruptions. Nor did they report smaller classes or fewer school resources than the control group in either year. Only after one year did Latino parents with children in private schools report less hallway monitoring and less racial segregation in the private sector.

The last column of tables 3-2 and 3-5 identifies whether or not the observed impacts for African Americans and Latinos are statistically significantly different from one another. Those items with asterisks represent plausible components of an explanation for why African Americans appear to benefit from vouchers, but Latinos do not. Four aspects of school life stand out: school size, parental communications, class size, and school disruptions. In both years, vouchers had a smaller impact on the size of the private schools and classrooms attended by Latino students than they did on those attended by African Americans. Also, while vouchers had a large and positive impact on the communication levels of African Americans, they had a relatively small impact on those of Latinos. And perhaps most striking, the magnitude of the impacts on school disruptions varied dramatically for Latinos and African Americans.

Other differences are evident in one of the two years. In year two the negative impact of attending a private school on hallway monitoring was significantly smaller for Latinos than it was for African Americans. The year-two impact on school resources, meanwhile, was larger. Given the sign of these differences, however, they probably do not explain why African American voucher students log the only test score gains. Could it be that African American students in private schools benefit from the fact that their hallways are less closely monitored? Do black students in private schools benefit because

Table 3-6. *Impact of Switching to a New York City Private School on African Americans' Test Scores Controlling for Likely Suspects*

Characteristic	Year one		Year two	
	(1)	(2)	(3)	(4)
Attend private school	5.4***	5.7***	4.3**	5.2**
School disruptions	—	−0.3	—	−2.1***
Communication	—	−0.4	—	−0.9
School size	—	−0.1	—	1.0
Class size	—	0.3	—	−0.2
Baseline math score	0.4***	0.4***	0.4***	0.4***
Baseline reading score	0.4***	0.4***	0.3***	0.3***
Constant	−2.9	−2.2	0.5	3.4
N	622	622	497	497
Adjusted R^2	.52	.51	.45	.43

** Significant at the 0.05 level on a two-tailed test.

*** Significant at the 0.01 level on a two-tailed test.

— Item not included in this model.

Note: Weighted least squares regressions performed. Impacts expressed in terms of national percentile rankings. All models control for baseline test scores and lottery indicators. Missing values for school covariates imputed by best subset regression.

they have fewer school resources than their public school peers, while Latinos in private schools have comparable levels? Probably not.

Note that from these impacts we cannot infer whether African Americans are coming from a particularly poor lot of public schools or are gaining access to a particularly effective group of private schools. All that we know is that along some dimensions, the impact of the switch from public to private school for African Americans was greater than that for Latinos.

School Characteristics and Voucher Effects

We added to our test score model measures of class size, school disruptions, school size, and school communications. If these four school characteristics explain the differential impact of attending a private school on the two ethnic groups, the voucher impact on African Americans should diminish or entirely disappear once they are included in the model.

The results for African Americans are reported in table 3-6. Column 1 reports the impact on African American test scores of attending a private school in New York City after one year: 5.4 percentile points. Column 3 shows the same effect after two years: 4.3 percentile points.

In columns 2 and 4, we report the effects of attending a private school in years one and two, respectively, after controlling for parental reports on

Table 3-7. *Impact of Switching to a New York City Private School on Latinos' Test Scores Controlling for Likely Suspects*

Characteristic	Year one		Year two	
	(1)	(2)	(3)	(4)
Attend private school	−1.4	−1.4	−0.9	−1.0
School disruptions	—	−2.2***	—	−0.9
Communication	—	1.5*	—	−0.3
School size	—	1.0	—	0.9
Class size	—	1.3*	—	2.5***
Baseline math score	0.4***	0.4***	0.4***	0.4***
Baseline reading score	0.4***	0.4***	0.3***	0.3***
Constant	20.2*	11.6	11.5	4.9
N	704	704	612	612
Adjusted R^2	.44	.46	.45	.46

* Significant at the 0.10 level on a two-tailed test.

*** Significant at the 0.01 level on a two-tailed test.

Note: Weighted least squares regressions performed. Impacts expressed in terms of national percentile rankings. All models control for baseline test scores and lottery indicators. Missing values for school covariates imputed by best subset regression.

school disruptions, school communications, class size, and school size. If these factors drive African American test score gains, then the effect of a voucher should diminish or disappear once they are added to the model. Unfortunately, this does not happen. The size of the impact remains essentially constant. Neither separately nor combined, these four factors do not explain why African Americans perform better on tests when given an opportunity to attend a private school. Parenthetically, only one of the four items in either year—the school disruption index in year two—has a significant and direct impact on African Americans' test scores. The others do not appear to have any causal impact at all.

Table 3-7 reports the results for Latino students from equivalent regressions. The offer of a voucher has no impact on student performance either before or after additional items are included in the equation. Furthermore, school disruptions appear to have a negative direct impact on student performance, especially after one year. Class size also has an effect, but its sign is perverse: Latinos do better in larger classes. This correlation could be caused, however, by the assignment of Latino students with language or learning difficulties to smaller classes.

Perhaps the factors that impact African American test scores are not the same ones that distinguish the impact of vouchers on the perceptions of

African American and Latino parents. Instead, some other factor or all factors combined may account for the differential race effects on test scores that we observe. To examine this possibility, we conducted a kitchen-sink analysis, one that included every survey item in a single model, along with all relevant interaction terms. Such a model is not a very good way of estimating the impact of any particular aspect of school life on student test score performance. Because few of the indexes measure distinct school characteristics, the estimated impact of each is partially estimated by others. However, this approach allows us to ascertain whether measurable aspects of school life help explain the private school advantage for African Americans.

Again, they appear not to. Even when we include all items—not only school disruptions, school communications, school size, and class size but also suspensions, dress rules, hallway monitoring, school resources, homework, segregation, parental involvement with child, and parental involvement with the school—in the equation, the impact of attending a private school on African American test scores remains statistically significant, while that for Latinos does not. In both years one and two, the impacts for African Americans in the comprehensive models register a statistically significant 6.3 NPR points. For Latinos, the impacts for years one and two were −1.8 and −1.5, respectively.

Discussion

If African Americans learn more in New York City private schools than they do in public schools, and if the private school impact is not due to school size, class size, school disruptions, school communications, desegregation, dress rules, hallway monitoring, school resources, homework, level of parental involvement with child's education, or their involvement with the school, then what does explain the difference?

Parental perceptions are not always as precise as one might like, and so these school characteristics should not be prematurely ruled out as possible explanations for the differential race effects that vouchers seem to generate. Still, though, we remain impressed by the similar patterns of parental response from one year to the next and one city to another. If parents were responding to questions more or less randomly, then we should observe different patterns that vary across city and over time. Instead, the pattern of parental responses is remarkably stable.

The voucher impacts could derive not from these items considered separately or additively, but through some complex interaction among some or all of the variables. Perhaps it is the interaction between school disruptions and

school size that counts? Or the interaction between parental-school communications and class size? Different aspects of school life may come together in different ways for African Americans and Latinos, generating contrasting test scores outcomes for the two groups.

Private school impacts also could stem from instructional factors that none of the items in our parental survey adequately measures. Perhaps the disparities between the quality of teachers for African American students in public and private schools are much wider than those for Latino students. Perhaps African American students are particularly and uniquely receptive to teaching techniques that are more prevalent in private schools. Recent research has shown that teacher effectiveness can have a large impact on student test score performance.[21] Our models, however, do not include any measures of curriculum, teaching techniques, the expectations that teachers place on their students, or teacher quality. Such factors might be the key to understanding why African Americans benefit from choice, but Latinos do not.

Finally, the effects may have nothing to do with the characteristics of public and private schools that African Americans and Latinos attend. They may instead derive from the quality of the peer groups at these schools. Richard Rothstein, for instance, has suggested that positive effects arise when voucher recipients "are surrounded by pupils with higher academic expectations."[22] If African Americans attend private schools with a particularly elite group of classmates, while the peer groups of Latinos who switch from public to private school change very little, then peer effects may lie at the heart of the story we are trying to uncover.

We still do not know what makes private schools successful, at least for African Americans. And without an answer, it remains unclear how, or even whether, public schools can introduce appropriate reforms that benefit African American students. Future pilot studies that contain a larger number of subjects, proceed for longer periods of time, and collect a broader array of information may unearth some of the reasons that at least some students appear to benefit from choice.

Appendix 3A

Depending upon which year the surveys were administered, indexes were constructed from all or a subset of the items that follow. Response categories are available upon request.

School disruptions. "How serious are the following problems at this child's school? Very serious, somewhat serious, or not serious?: Kids destroying

property; kids being late for schools; kids missing classes; fighting; cheating; racial conflict; guns or other weapons; drugs or alcohol."

Suspensions. "During this past year, was this child ever suspended for disciplinary reasons?"

Dress rules. "Are students required to wear a uniform?" "Are certain forms of dress forbidden?"

Hallway monitors. "Are visitors required to sign in at main office?" "Are hall passes required to leave class?"

School resources. "At the school this child attends, which of the following programs or facilities are available to students?: A computer lab; a library; a gym; a cafeteria; child counselors; a nurses' office."

School programs. "At the school this child attends, which of the following programs or facilities are available to students?: Special programs for non–English speakers; individual tutors; special programs for students with learning problems; special programs for advanced learners; a music program; an arts program; an after-school program."

School communication with parents. "Do the following practices exist in this child's school?: Parents informed about student grades halfway through the grading period; parents notified when student are sent to the office the first time for disruptive behavior; parents speak to classes about their jobs; parents participate in instruction; parent open-house or back-to-school night held at school; regular parent-teacher conferences held; parents receive notes about this student from this child's teachers; parents receive a newsletter about what is going on in this child's school or classroom."

Amount of homework. "Approximately how much homework is assigned on an average day?"

Class size. "Approximately how many students are in this child's class?"

School size. "Approximately how large is the school this child attends?"

Racial segregation. "What proportion of students in this child's classroom is minority?" Percent responding "everyone" or "90–100 percent."

Parental involvement with child's education. "In the past month, how often did you do the following?: Help this child with his or her homework; help this child with reading or math that was not part of his or her homework; talk with this child about his or her experiences at school; attend school activities; work on school projects."

Parental involvement with child's school. "How many parent-teacher conferences did you attend this school year?" "How many hours have you volunteered in this child's school this past month?" "Are you a member of a PTA [Parent-Teacher Association] or other similar organization (Parent's Council, for example)?"

Satisfaction index. "How satisfied are you with the following aspects of this child's current school?: Location of school; school safety; teaching; how much school involves parents; class sizes; school facilities; student respect of teachers; how much teachers inform parents of students' progress; how much students can observe religious traditions; parental support for the school; discipline; clarity of school goals; teamwork among staff; teaching values; academic quality; the sports program; what is taught in the school."

Notes

1. Disparate findings have emerged from these studies. For example, one analysis of the Milwaukee, Wisconsin, choice experiment found test score gains in reading and math, particularly after students had been enrolled for three or more years, while another study found gains only in math, and a third found gains in neither subject. Jay P. Greene, Paul E. Peterson, and Jiangtao Du, "School Choice in Milwaukee: A Randomized Experiment," in Paul E. Peterson and Bryan C. Hassel, eds., *Learning from School Choice* (Brookings, 1998), pp. 335–56; Cecilia Rouse, "Private School Vouchers and Student Achievement: An Evaluation of the Milwaukee Parental Choice Program," Princeton University, Department of Economics, 1997; and John F. Witte, "Achievement Effects of the Milwaukee Voucher Program," paper presented at the 1997 annual meeting of the American Economics Association. On the Cleveland, Ohio, program, see Jay P. Greene, William G. Howell, and Paul E. Peterson, "Lessons from the Cleveland Scholarship Program," in Paul E. Peterson and Bryan C. Hassel, eds., *Learning from School Choice* (Brookings, 1998), pp. 357–92; and Kim K. Metcalf and others, "A Comparative Evaluation of the Cleveland Scholarship and Tutoring Grant Program: Year One: 1996–97," Indiana University, School of Education, Smith Research Center, March 1998. Greene, Peterson, and Du, "School Choice in Milwaukee," reports results from analyses of experimental data; the other studies are based upon analyses of nonexperimental data.

2. Since this paper was prepared, further information has been gathered and is reported in William Howell and Paul E. Peterson, with Patrick Wolf and David Campbell, *The Education Gap: Vouchers and Urban Schools* (Brookings, 2002). See also William G. Howell and others, "School Vouchers and Academic Performance: Results from Three Randomized Field Trials," *Journal of Policy Analysis and Management*, vol. 21, no. 2 (2002), pp. 191–218.

Other papers that report results from the evaluations include William G. Howell and Paul E. Peterson, "School Choice in Dayton, Ohio: An Evaluation after One Year," paper prepared for the Conference on Charters, Vouchers, and Public Education, 2000, sponsored by Harvard University, John F. Kennedy School of Government, Taubman Center on State and Local Government, Program on Education Policy and Governance, Cambridge, Mass., available at www.ksg.harvard.edu/pepg/; and Patrick J. Wolf, William G. Howell, and Paul E. Peterson, "School Choice in Washington, D.C.: An Evaluation after One Year," paper prepared for the Conference on Charters, Vouchers, and Public Education, 2000, sponsored by Harvard University, John F. Kennedy School of Government, Taubman Center on State and Local Government, Program on Education Policy and Governance, Cambridge, Mass., available at www.ksg.harvard.edu/pepg/. First-year results from the New York City evalua-

tion are reported in Paul E. Peterson and others, "The Effects of School Choice in New York City," in Susan B. Mayer and Paul E. Peterson, eds., *Earning and Learning: How Schools Matter* (Brookings, 1999), chapter 12. For results from the second-year evaluation of New York City's voucher program, see David Myers and others, "School Choice in New York City after Two Years: An Evaluation of the School Choice Scholarships Program," Occasional Paper (Harvard University, John F. Kennedy School of Government, Taubman Center on State and Local Government, Program on Education Policy and Governance, September 2000), available at www.ksg.harvard.edu/pepg/.

3. Thomas Hoffer, Andrew Greeley, and James Coleman, "Achievement Growth in Public and Catholic Schools," *Sociology of Education*, vol. 58 (April 1985), pp. 74–97; Douglas Wilms, "Catholic School Effects on Academic Achievement: New Evidence from the High School and Beyond Follow-up Study," *Sociology of Education*, vol. 58 (April 1985), pp. 98–114; and Christopher Jencks, "How Much Do High School Students Learn?" *Sociology of Education*, vol. 58 (April 1985), pp. 128–35.

4. Hoffer, Greeley, and Coleman, "Achievement Growth in Public and Catholic Schools," tables 1.7 and 1.8., pp. 80–81; these are the estimates of effects when controlling for background characteristics and years in Catholic school.

5. Jencks, "How Much Do High School Students Learn?" p. 134.

6. Derek Neal, "The Effects of Catholic Secondary Schooling on Educational Achievement," *Journal of Labor Economics*, vol. 15, no. 1 (1997), part 1, pp. 98–123.

7. William N. Evans and Robert M. Schwab, "Who Benefits from Private Education? Evidence from Quantile Regressions," University of Maryland, Department of Economics, 1993; and David Figlio and Joe Stone, "School Choice and Student Performance: Are Private Schools Really Better?" University of Wisconsin, Institute for Research on Poverty, 1977. Other studies finding positive educational benefits from attending private schools include James S. Coleman, Thomas Hoffer, and Sally Kilgore, *High School Achievement* (Basic Books, 1982); and John E. Chubb and Terry M. Moe, *Politics, Markets, and America's Schools* (Brookings, 1990). Critiques of these studies have been prepared by Arthur S. Goldberger and Glen G. Cain, "The Causal Analysis of Cognitive Outcomes in the Coleman, Hoffer, and Kilgore Report," *Sociology of Education*, vol. 55 (April–July 1982), pp. 103–22.

8. Results from these evaluations are reported in Paul E. Peterson and Bryan C. Hassel, eds., *Learning from School Choice* (Brookings, 1998).

9. Take-up rates are the percentage of those offered vouchers who attend private schools. The rates reported here are for those who participated in the evaluations in years one and two. Take-up rates are somewhat lower when calculated for those who did not participate in the evaluation.

10. More precisely, the notation for the two-stage models is as follows:

$$P = \alpha_1 + \beta_1 V + \beta_2 Y_{0R} + \beta_3 Y_{0M} + \mu_1$$

$$Y_t = \alpha_2 + \beta_4 P + \beta_5 Y_{0R} + \beta_6 Y_{0M} + \mu_2$$

P is an indicator variable for attendance at a private school. β_2 represents the estimated impact of switching from a public to a private school on student test scores. Y_t is each student's total achievement score on the Iowa Test of Basic Skills expressed in national percentile ranking (NPR) points, where the subscript *t* denotes the year the student completed the follow-up test (either 1 or 2). The total achievement score is a simple average of the math and reading components. Because it is based upon a larger number of test items, the total achievement score is likely to generate more stable estimates than are reading and math scores estimated separately. (See Alan B. Krueger, "Experimental Estimation of Production Function," *Quarterly Journal of Economics* [May 1999], pp. 497–537.) *V* is an indicator variable for whether or not an individual was offered a voucher. Y_{0R} and Y_{0M} are the baseline reading and math scores.

11. In this paper we focus on overall or combined test score results, which simply represent the average of the math and reading components. When we use one-hour testing sessions to gauge student performance, their combined reading and math scores serve as a better indicator of student achievement than either subcomponent separately. Theoretically, the more test items used, the more likely performance is accurately measured. As Jencks, "How Much Do High School Students Learn?" p. 131, points out with respect to Douglas Wilms's findings in "Catholic School Effects on Academic Achievement," "some of the apparent 'noise' in Wilms's Table 7 might have disappeared had he collapsed different sophomore tests into a single composite."

12. See chapter 2 in this volume, Alan B. Krueger and Diane M. Whitmore, "Would Smaller Classes Help Close the Black-White Achievement Gap?"

13. See also Ann Flanagan, Jennifer Kawata, and Stephanie Williamson, *Improving Student Achievement: What NAEP Test Scores Tell Us* (Santa Monica, Calif.: RAND Corporation, 2000), p. 59.

14. Bruce Fuller, Luis Huerta, and David Ruenzel, *A Costly Gamble or Serious Reform? California's School Voucher Initiative—Proposition 38* (University of California at Berkeley and Stanford University, Policy Analysis for California Education, 2000), p. 10.

15. *Deception by the Numbers: Ten Reasons to Doubt the Latest Claims for Vouchers*, report available at www.pfaw.org.

16. Richard Rothstein, "Judging Vouchers' Merits Proves to be Difficult Task," *New York Times*, December 13, 2000, p. A25; and Martin Carnoy, "Do School Vouchers Improve Student Performance?" *American Prospect*, vol. 12, no. 1 (January 2001), available at www.prospect.org.

17. Items listed in the previous section include only those that formed part of the baseline survey. Later surveys added more items.

18. Howell and Peterson, with Wolf and Campbell, *The Education Gap*, chapter 5.

19. Wolf, Howell, and Peterson, "School Choice in Washington, D.C."

20. See Howell and others, "Test-Score Effects of School Vouchers"; Howell and Peterson, "School Choice in Dayton, Ohio"; Wolf, Howell, and Peterson, "School

Choice in Washington, D.C."; Peterson and others, "The Effects of School Choice in New York City"; and Myers and others, "School Choice in New York City after Two Years."

21. Steven G. Rivkin, Eric A. Hanushek, and John F. Kain, "Teachers, Schools and Academic Achievement," April 2000.

22. Rothstein, "Judging Vouchers' Merits Proves to Be Difficult Task," p. A25.