

## **Racial Segregation and the Private/Public School Choice**

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**Abstract:** Using data from the National Educational Longitudinal Study (NELS), I examine ethnic and racial patterns of private school attendance. I find that a high level of racial sorting occurs between the private and public school systems. At both the 8th and 10th grade levels, blacks and Hispanics are substantially less likely to attend private schools than are whites. I also find evidence that racial sorting between the private and public school systems is partly due to preferences over the racial composition of schools. In particular, I find that white and Hispanic students enroll in private schools in response to large concentrations of black students, although the underlying causes are unknown. I also examine whether ethnic and racial income disparities contribute to the large differences in private school attendance rates. I find that lower levels of income among black and Hispanic families contribute substantially to the underrepresentation of these two groups in the private school system. My estimates indicate that racial disparities in income levels explain 34.9 to 56.7 percent of the white/black gap in the private school attendance rate and 49.7 to 57.5 percent of the white/Hispanic gap in the private school rate. Finally, I find that whites attend private schools that are less integrated than public schools, and blacks and Hispanics attend private schools that are slightly more integrated than public schools. These findings can be interpreted as providing both evidence suggesting that vouchers will lead to increased segregation and evidence suggesting that vouchers will lead to decreased segregation. The finding of racially motivated flight from public schools into private schools suggests that the introduction of private school tuition vouchers may lead to more segregation as families have increased opportunities to enroll their children in homogenous schools. In contrast, the finding that racial differences in income explain a significant portion of the gap in private school rates suggests that vouchers directed towards low-income families may reduce this gap. A definitive answer, however, to whether private school vouchers will increase or decrease racial segregation in the nation's schools is only possible after several large-scale and long-term experimental programs are implemented and evaluated.

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## 1. Introduction

Private school vouchers are perhaps the most hotly debated topic in current discussions of educational reform. Critics have often argued that vouchers for private school tuition will lead to increased racial segregation in the nation's schools. On the other hand, proponents contend that vouchers available to all students or vouchers targeted to only low-income students may reduce segregation as differences in parental income become less important in determining who attends private school.

A definitive answer to whether vouchers will increase racial segregation, however, is not possible until several large-scale experimental programs have been implemented and evaluated. Furthermore, it may take several years or possibly decades before a new long-run equilibrium is reached. Evaluations conducted only a few years after implementation may reveal very little about the long-run effects of vouchers because they will not fully account for, along with many other factors, the long-run supply responses of existing private schools, entry by new private schools, competitive responses by public schools, and long-run demand responses.

The goal of this paper is more modest. Using data from the National Educational Longitudinal Study (NELS) and a recently released confidential dataset from the National Center for Educational Statistics (NCES), I examine ethnic and racial patterns of private school attendance. This analysis may provide some suggestive evidence on whether increased school choice through private school tuition vouchers is likely to increase or decrease racial segregation in the nation's schools. I first document the large disparities that currently exist in private school attendance rates across ethnic and racial groups and examine how these patterns contribute to the racial composition of the private and public school systems. Second, I explore whether flight from public schools into private schools is racially motivated. A finding of large levels of racial motivated private school flight may suggest that a full-scale voucher system will lead to increased racial segregation as financial constraints are removed for many families. Third, I examine whether ethnic and racial income disparities contribute to the differences in rates of private school attendance. If racial differences in income explain a significant portion of the gap in private school rates, then vouchers directed towards minorities might help to eliminate this gap in private school attendance rates. On the other hand, if other factors less amenable to change through public policy explain most of the variation then vouchers might achieve little if any reduction in the observed gaps in private school attendance among groups. Finally, I provide some estimates of existing levels of racial segregation in private and public schools.

## 2. Data

I use data from the National Educational Longitudinal Study (NELS) and a recently released confidential dataset from the National Center for Educational Statistics (NCES). The NELS follows a national sample of American youths who were enrolled in the eighth grade in 1988 at two-year intervals.<sup>1</sup> In this analysis, I use data from the 1988 base year and the 1990 first follow-up. These two years of data allow me to examine the determinants of attending private school at both the 8th and 10th grade levels.

The data include detailed information on the student and his/her family. In addition to measures of family income and parental education, I use information on religion and racial attitudes, which are not available in most other national data sources. I also append school and community characteristics from various sources to these individual-level data. The restricted-use version of NELS that has been available for several years does not allow one to identify the residential location of respondents below the state level. Although the restricted-use version identifies the public schools attended by NELS respondents, it does not identify private schools. This information, however, would be less useful as many private school students are likely to attend schools outside of their immediate residential area.

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<sup>1</sup> See Huang, et al. (1996) for more details on the NELS.

To identify residential locations, I use a recently released dataset from the NCES that contains 1990 Census demographic data at the zip code level for each NELS respondent. This dataset, however, does not identify actual zip codes. With permission from the NCES, I use data from the 1990 Census STF 3B Files to match to this dataset, and thus identify each student's zip code. The zip codes are used to calculate distances to private schools and to identify each student's county of residence.<sup>2</sup> The latter, however, is not straightforward as many zip codes cross county boundaries. I therefore use the following algorithm to identify the county of residence. First, I eliminate counties in which the zip code only captures non-residential parts of that county. This step allows assignment of a unique county of residence to approximately 90 percent of the total sample. Second, for the remaining public school students I use the county of the student's school. Third, for the remaining private school students I use the county that represents the largest fraction of the total population for that zip code.

In the main analysis sample, I include only white, Hispanic and black children who are currently enrolled in school. I do not include Asian or Native American schoolchildren because of small sample sizes. I also do not differentiate between Catholic, other religious, and secular private schools due to small sample sizes.

### **3. Racial Differences in Private School Rates**

Racial groups differ markedly in their average propensities to attend private school. In Table 1, I report private school rates by race for 8th grade students in 1987-88 and 10th grade students in 1989-90. The private school rate is defined as the fraction of all schoolchildren that are enrolled in private school. All estimates are weighted to make them representative of the U.S. population of 8th and 10th graders in 1987-88 and 1989-90, respectively.

The estimates indicate that white schoolchildren are substantially more likely to attend private school than are black or Hispanic schoolchildren. Slightly more than 13 percent of white 8th graders and 11 percent of white 10th graders attend private school. In contrast, only 7.1 percent of black 8th graders and 6.9 percent of black 10th graders attend private school. The Hispanic private school rates are 9.5 and 8.4 percent.

These estimates imply that black and Hispanic schoolchildren are underrepresented in the private school system relative to the public school system. In Table 2, I report aggregate racial compositions in public and private schools. As expected from the patterns in private school rates, blacks and Hispanics represent a small fraction of all private school students. Blacks comprise 12.5 to 14.0 percent of all public schools students, but only 7.7 to 7.8 percent of all private school students. Hispanics also comprise a lower percentage of all private school students than public school students, although the difference is not as large. These estimates provide evidence of a high level of racial sorting into the private and public school systems at the aggregate level.

### **4. Private School Flight**

An important question is whether the racial sorting into the private and public school systems documented above is partly due to preferences over the racial composition of schools. Similar to some student, family, school and geographical characteristics, the racial composition of available schools may be an important determinant of the private/public school choice. In the presence of racially motivated flight from public schools into private schools, it is possible that the introduction of private school tuition vouchers will lead to more segregation as families have increased opportunities to enroll their children in homogenous schools.

Several recent studies explore whether the choice between private and public school among white students is influenced by the racial composition of the local student population. There is no consensus in the literature, however, on whether "white flight" exists. Conlon and

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<sup>2</sup> After identifying the county of residence I identify the student's PMSA by using the county-based definitions of PMSAs provided on the 1994 USA Counties CDROM.

Kimenyi (1991), Lankford, Lee, and Wyckoff (1995), Lankford and Wyckoff (1997) and Fairlie and Resch (2002) provide evidence of "white flight" from minorities or blacks. In contrast, Buddin, Cordes and Kirby (1998) find that the probability of attending private school among all students is insensitive to the minority share of public schools at both the elementary and secondary level, and Figlio and Stone (1999) find that the private school probability among all 10th graders is insensitive to the minority share of the population. In addition, Lankford and Wyckoff (1992) find that white children are more likely to attend public high school when these schools have larger concentrations of black students.<sup>3</sup>

Following the analysis in Fairlie and Resch (2002), I use the special release of the NELS to provide evidence on the "white flight" hypothesis. I also expand the analysis to examine whether black and Hispanic students are opting out of the public school system partly as a response to the racial composition of available schools.

To explore these issues, I first create and estimate a reduced-form equation for private school attendance. I assume that private school is determined by an unobserved latent variable,

$$(3.1) \quad Y_i^* = X_i' \beta + \varepsilon_i,$$

where  $X_i$  includes student, parental, school and geographical area characteristics, and  $\varepsilon_i$  is the disturbance term. Only the dichotomous variable,  $Y_i$ , is observed, however. It equals 1 if  $Y_i^* \geq 0$  (denoting private school attendance) and equals 0 otherwise (denoting public school attendance). If we take  $\varepsilon_i$  to be normally distributed, the assumptions imply that the data are described by a probit model. Although the normality assumption should only be taken as an approximation, the probit model provides a useful descriptive model for the binary event that a student attends private school.

A complication arises, however, in the use of a standard probit regression because the NELS includes an oversample of private school students. To correct for this problem I use a choice-based sampling maximum likelihood estimator (CBSMLE).<sup>4</sup> The likelihood function for this estimator is weighted to account for the oversample of ones for the dependent variable. Observations in which  $Y=0$  and  $Y=1$  are given weights of  $P^W/P^U$  and  $(1-P^W)/(1-P^U)$ , respectively, where  $P^W$  is the private school rate calculated using sample weights provided by the NELS, and  $P^U$  is the unweighted private school rate.

I estimate several choice-based sample corrected probit regressions for the probability of attending private school using a sample of white, black and Hispanic students. In addition to measures of student, parental, school and geographical area characteristics, I include the black and Hispanic shares of the school-age population. The coefficients on these two variables provide evidence on whether private/public school choices are sensitive to the racial composition of the local public schools. Because whites, blacks and Hispanics are likely to differ in how they respond to the racial composition of the schools, I interact the race of the student with the black and Hispanic population shares. These interactions, for example, will allow for the possibility that whites react differently than Hispanics to the presence of black schoolchildren.

I measure the black and Hispanic shares of the population at both the county and PMSA-levels. The main advantage to using the county-level measure is that it captures a smaller geographical area, and is thus less likely to suffer from problems associated with aggregating heterogeneous areas. However, there are a few disadvantages to using the county-level measure. The first of these is particularly important. Suppose that whites respond to high concentrations of minorities not by enrolling their children in private school, but instead by moving to other neighborhoods where the public schools have fewer minority students. This may cause an upward bias on the coefficient estimate for the minority proportion of the population if one focuses on narrow geographic areas such as counties. Specifically, any movement from high-

<sup>3</sup> They find a negative relationship, however, for public elementary students.

<sup>4</sup> See Amemiya (1985) for more details.

minority school districts to low-minority school districts increases the private school rate in the sending district and decreases the private school rate in the receiving district, thus implying a larger positive correlation between the private school rate and the minority share. In contrast, the use of PMSAs as the unit of analysis greatly reduces this problem because these areas typically encompass many neighborhoods.<sup>5</sup>

A second but related rationale for using PMSAs concerns the endogeneity of households' location more generally. The influence of educational resources on residential location decisions is likely to be much stronger across school districts or counties than across metropolitan areas. In other words, families are more likely to move between districts or counties within a PMSA as a result of variations in school quality than they are to move between PMSAs. Moves between PMSAs are likely to be influenced mainly by factors apart from schooling, such as the availability of jobs or the presence of family members. This suggests that the simultaneity of location decisions and school sector choices poses less of a problem when the unit of analysis is the PMSA than when it is a smaller geographical area, such as a county.

The third justification for using PMSAs as the unit of analysis is that they more accurately represent markets for private schools than do counties or school districts. Certainly, many families send their children across county lines to private schools.

Taking these arguments into consideration, I estimate separate regressions using PMSA and county-level measures of the black and Hispanic shares of the school-age population. I first discuss the results for the PMSA-level measures (reported in Specifications 1 and 2 of Table 3). I estimate separate regressions for the samples of 8th- and 10th-grade students. In addition to the black and Hispanic share interaction variables, I include controls for race, age, sex, number of siblings, religion, parental education, family income, distance to the closest private school, private and public school quality, poverty rate, and crime.<sup>6</sup> The coefficients on the individual-level variables generally have the expected signs. Catholics are more likely to attend private school than are members of other religious groups. The probability of attending private school increases with both mother's and father's education level. Finally, higher levels of family income increase the probability of attending private school. The coefficient estimates on the school and geographical area variables are generally statistically insignificant and in many cases have unexpected signs.

The results for the distance to the closest private school are noteworthy because of concerns about the accessibility of private schools across different racial groups. I create this variable by first identifying the longitude and latitude of all zip codes in the United States. For each NELS respondent I then calculate the distance to every private school with at least 100 students and include the closest distance and its square in the probit regressions.<sup>7</sup> I find that the distance to the closest private school has a negative (for almost its entire range in the sample) and statistically significant effect on the probability of attending private school.

I now turn to the results for the race/population share interactions. I first examine the interactions between the white dummy variable and the black and Hispanic shares of the school-

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<sup>5</sup> It would also be interesting to examine whether white families move to alternative school districts or counties in response to minority schoolchildren. However, it is difficult to distinguish between whether the locational choices of whites are determined by the presence of minorities in the public schools or by the presence of minorities in the neighborhood. These issues are beyond the scope of this paper.

<sup>6</sup> A more complete description of the effects of these control variables and their sources is available in Fairlie and Resch (2002).

<sup>7</sup> I thank Todd Elder for providing a Matlab program that calculates the distance between any two points given their longitude and latitude. A Fortran version of the program is available at the National Oceanic and Atmospheric Administration, National Geodetic Survey web page: [ftp://ftp.ngs.noaa.gov/pub/pcsoft/for\\_inv.3d/source/inverse.for](ftp://ftp.ngs.noaa.gov/pub/pcsoft/for_inv.3d/source/inverse.for). Private school zip codes are obtained from original records of the 1989-90 Private School Survey. I obtained a special listing from Steve Broughman at the NCES.

age population. Similar to the findings reported in several previous studies, the black share has a positive and statistically significant effect on the probability of attending private school among whites. This result holds at both the 8th- and 10th-grade levels. Furthermore, the coefficients in both specifications imply nontrivial effects. For example, a 10 percentage point increase in the black share increases the probability of private school attendance by 0.027 (or 18.8 percent) among white 8th graders and 0.032 (or 25.6 percent) among white 10th graders.<sup>8</sup> This finding and the estimates reported in Table 2 are consistent with "white flight" to private schools in response to larger concentrations of black schoolchildren.

An interaction between white race and the Hispanic share of the school-age population is also included in the regressions. The coefficient estimates on this variable are negative and statistically significant. In addition, the coefficients imply non-negligible effects on the probability of private school attendance among non-Hispanic whites. A 10 percentage point increase in the Hispanic share leads to a 0.032 to 0.036 decline in the private school probability. The negative sign on this variable is difficult to interpret. As indicated in Table 2, Hispanic schoolchildren comprise a smaller percentage of all private school students than public school students.

The second set of interaction variables are for black respondents. Both variables are statistically insignificant in the two specifications. Therefore, the estimates do not provide evidence that black students are responding to the racial composition of the local schools. There is some concern, however, that the point estimates imply somewhat large effects, which raises the issue of whether the lack of statistical significance is due primarily to smaller black sample sizes. The final set of interaction variables is for Hispanic respondents.<sup>9</sup> The black share of the school-age population has a positive and statistically significant effect on the probability of attending private school among Hispanics. The coefficients reported in Specifications 1 and 2 also imply large effects. An increase in the black share of 10 percentage points increases the probability of private school attendance by 0.047 (or 32.8 percent) among Hispanic 8th graders and 0.041 (or 32.8 percent) among Hispanic 10th graders. These results are consistent with "Hispanic flight" from black schoolchildren. The negative coefficients on the Hispanic share interaction, however, are difficult to interpret. One possible explanation is that the public schools located in PMSAs with large concentrations of Hispanic schoolchildren may better tailor their curricula for these students.

I also estimate probit regressions that include county-level measures of the black share, Hispanic share, public student to teacher ratio, public expenditures per pupil, crime rate and poverty rate (reported in Specifications 3 and 4). The number of observations used in these regressions increases appreciably as many NELS respondents live in counties that are located outside of PMSAs. Using the county-level measure of the black share, the coefficient estimates on the interactions with white race are larger for both grades. The coefficients imply that a 10 percentage point change in the black share increases the private school probability by 0.027 (23.5 percent) among white 8th graders and 0.030 (31.3 percent) among white 10th graders. In contrast, the Hispanic share interactions are now smaller.

Among black students, the black and Hispanic shares are notably smaller in absolute value and remain statistically insignificant, providing additional evidence that black students are not overly responsive to the racial composition of the school-age population. In contrast,

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<sup>8</sup> These estimates are calculated by multiplying the coefficient estimate by the average derivative adjustment factor reported at the bottom of Table 3. The average derivative adjustment factor is  $\sum \beta_i \phi(X_i' \beta) / N$ , where  $\beta_i$  is the coefficient on the minority share and  $\phi$  is the normal probability density function. The effect of a one unit increase in any of the independent variables on the private school probability can be estimated by multiplying the coefficient on that variable by the average derivative adjustment factor.

<sup>9</sup> See Fairlie (2002) for a more detailed analysis.

however, the county-level regressions provide additional evidence of "Hispanic flight" from black schoolchildren. The Hispanic/black share interaction variable is smaller, but remains large and statistically significant.

As a check of the robustness of these results, I estimate three additional sets of regressions. First, I estimate regressions that do not include the distance variables because of the potential endogeneity issues associated with this variable. Although the distance variables are highly significant, their removal does not have a notable effect on the coefficient estimates on the other variables. Most importantly, the resulting black and Hispanic share interaction coefficients do not differ appreciably from those reported in Table 3. Second, I estimate regressions that do not include the serious crime rate and the school-age poverty rate. These two variables are highly correlated with the Hispanic share. In all of the specifications, the black share interactions increase slightly and the Hispanic share interactions become notably smaller in absolute value. Finally, I estimate separate regressions by race.<sup>10</sup> As expected, the white results are very similar. The results for blacks and Hispanics differ somewhat, but the overall conclusions remain the same.

To summarize, I find that the black share of the school-age population measured at both the PMSA and county levels has a positive and statistically significant effect on the probability of private school attendance among whites and Hispanics. These results are robust to alternative specifications and samples, and provide evidence that white and Hispanic students enroll in private schools in response to large concentrations of black students. The evidence, however, is less clear for private school flight from Hispanic schoolchildren.

## **5. Do Racial Differences in Income Explain Group Differences in Private School Rates?**

Are the large racial differences in private school rates documented in Section 3 due to differences in income or are they primarily due to other factors? The answer to this question may provide insights into the effects of private school vouchers on school segregation. Specifically, if income explains a significant portion of the gap in private school enrollment rates, then vouchers directed towards minorities might help to equalize attendance rates among groups. On the other hand, if other factors less amenable to change through public policy explain most of the variation then vouchers might achieve little, if any, reduction in the observed gaps in private school attendance among groups.

The results from the probit regressions indicate that family income is a major determinant of who attends private school. In all of the specifications, the private school probability increases with each income category. Across many of these income categories, the effects implied by the coefficient estimates are extremely large. For example, a student with a family income of \$35,000 to \$50,000 is 5.6 to 7.3 percentage points more likely to attend private school than a student with a family income of less than \$15,000, all else equal. Even more striking is the finding that a family income of \$100,000 increases the probability of attending private school by 11.2 to 15.4 percentage points over a family income of \$35,000 to \$50,000 and by 17.2 to 21.7 percentage points over a family income of less than \$15,000. The effects are large when viewed in relation to the average sample probabilities of attending private school (0.072 to 0.176).

The results reported in Table 3 indicate that other student or family characteristics are also major determinants of private school attendance. In particular, religion and parental education play important roles in predicting who attends private school. Catholic and Jewish students, and students with more educated mothers and fathers are more likely to attend private school, all else equal. Finally, the distance between the student's residence and the closest private school has a large negative effect on the probability of attending private school.

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<sup>10</sup> Because of smaller sample sizes for blacks and Hispanics, I collapse some of the categories for religion and parental education.

Estimates from the NELS indicate that racial groups differ substantially in many of these characteristics that predict private school attendance (see Table 4).<sup>11</sup> The religious distributions, parental education levels, and family income levels differ substantially across racial groups. For example, 20.1 percent of white students have college educated mothers, whereas only 10.0 percent of black and 7.9 percent of Hispanic students have college educated mothers. Racial differences in income are similarly large. Only 21.6 and 26.2 percent of black and Hispanic students, respectively, have family incomes of more than \$35,000, compared to 55.6 percent of white students. Working in the opposite direction, however, black and Hispanic students live closer to private schools on average than white students. Finally, most of the school and geographical area characteristics are similar across races.

Although the coefficient estimates reported in Table 3 and the mean estimates reported in Table 4 imply that racial differences in parental education, religion, and family income contribute to racial differences in private school rates, it is useful to estimate the size of their separate contributions. Identifying the magnitude of these separate effects provides evidence on the relative importance of racial differences in income, and thus may shed some light on the impact of private school vouchers.

To explore these issues further I employ a slight variant of the familiar technique of decomposing inter-group differences in a dependent variable into those due to different observable characteristics across groups and those due to different "prices" of characteristics of groups (see Blinder 1973 and Oaxaca 1973). In particular, the difference between the private school rate of group  $g$  and the private school rate of group  $j$  can be expressed as:

$$(5.1) \quad \bar{Y}^g - \bar{Y}^j = (\bar{X}^g - \bar{X}^j)\hat{\beta}^g + \bar{X}^j(\hat{\beta}^g - \hat{\beta}^j),$$

where  $\bar{X}^g$  is a row vector of average values for the individual-level characteristics and the MA distribution, and  $\hat{\beta}^g$  is a vector of coefficient estimates for group  $g$ . The first term in the decomposition represents the part of the gap that is due to group differences in average values of the independent variables, and the second term represents the part due to differences in the group processes determining private school attendance. I further decompose the first term into the separate contributions from group differences in specific variables, such as religion, parental education, and family income. The second term or "unexplained" portion cannot be similarly decomposed into separate contributions and is typically calculated by subtracting the first term in (5.1) from the total gap.<sup>12</sup>

An equally valid method of calculating the decomposition is to use the coefficient estimates for group  $j$  (i.e.  $\hat{\beta}^j$ ) as weights in estimating the contributions from group differences in the independent variables. This alternative method of calculating the decomposition often provides different estimates, which is the familiar index problem with the Blinder-Oaxaca decomposition technique.

A third alternative, used in Neumark (1988) and Oaxaca and Ransom (1994), is to weight the first term of the decomposition expression using coefficient estimates from a pooled sample of the two groups. I follow this approach to calculate the decompositions. In particular, I use coefficient estimates from a regression that includes the pooled sample of white, black and Hispanic students. I then calculate the decomposition for the private school rate gap between whites and blacks or Hispanics. Thus, the first term in the decomposition that captures the explained variation in mean attendance rates between attendance group  $j$  and the white (W) group is

$$(5.2) \quad (\bar{X}^W - \bar{X}^j)\hat{\beta}^*,$$

<sup>11</sup> For brevity, I only report the racial distributions for the 8th-grade PMSA sample.

<sup>12</sup> The interpretation of this term for specific subsets of variables, such as parental education, is problematic because it is sensitive to the choice of the left-out category.

where  $\hat{\beta}^*$  are the pooled coefficients. The unexplained term in the decomposition is calculated by subtracting (5.2) from the total private school rate gap. This technique has two important advantages over the first two decomposition techniques. First, the use of the same coefficient estimates for weighting the explained part of the decomposition allows me to easily compare results across groups. Second, I avoid the problem of using imprecisely estimated coefficients for some of the smaller minority groups. This is important because of the many categorical variables used in the regressions that have small cell sample sizes.

In Table 5, I report the results from the decompositions of the white/black and white/Hispanic gaps in the private school rate. I report separate contribution estimates for racial differences in religion, parental education, family income, and distance to private schools. I also report contribution estimates for the controls (age, sex, and number of siblings), and school and geographical characteristics. I include only estimates from the PMSA-level specifications to partly remove urban/rural differences across racial groups.

I first discuss the results for the decomposition of the white/black 8th-grade private school rate gap of 0.0872 (reported in Panel I). As expected, the contribution from racial differences in family income is positive and large. This finding suggests that low levels of family income among black students contribute to the group's low rate of private school attendance. In fact, the white/black income difference explains nearly 35 percent of the private school rate gap. This contribution is larger than the contribution from racial differences in parental education of 23.5 percent, but is smaller than the contribution from racial differences in religious distributions (42.6 percent). Finally, the differences between white and blacks in average school and geographical area characteristics explain only a fraction of the gap, and the white/black difference in distances to the private schools provide a negative contribution to the gap. The negative contribution suggests that if blacks lived, on average, as far as whites do from private schools then the white/black gap in private school rates would be even larger. The average distance to the closest private school among blacks is 1.8 kilometers, compared to 4.0 kilometers for whites.

The private school rate gap between white and Hispanic students is 5.0 percentage points. Differences in family income provide a larger contribution to the white/Hispanic private school rate gap than the white/black gap. Nearly 50 percent of the private school rate gap is due to lower levels of family income among Hispanic students. This contribution, however, is smaller than the contribution of 64.1 percent from racial differences in parental education. Interestingly, the contribution from white/Hispanic differences in religious distributions is -0.050 or -100.0 percent. This finding suggests that the private school rate gap would be twice as large if whites and Hispanics had similar religious distributions, which is mainly due to the larger percentage of Hispanic students that are Catholics (71.9 percent compared to 33.8 percent for white students). The decomposition results for the 10th grade sample are fairly similar (reported in Panel II of Table 5). The most important difference is that the racial difference in family income now explains 56.7 percent of the white/black gap in the private school rate gap. This contribution estimate is very similar to the contribution from differences in family income to the white/Hispanic gap. The contributions from parental education and religion are also larger for the white/black gap, but are smaller in absolute value for the white/Hispanic gap.

The decomposition estimates indicate that group differences in income levels account for large percentages of the gaps in private school rates. This finding suggests that the high tuition costs of private schools may limit the opportunities of some blacks and Hispanics to attend these schools. It also implies that vouchers targeted at low-income groups may have the effect of reducing part of the racial differences in private school attendance.

The racial gaps in private school rates, however, are not entirely due to differences in income levels. Differences in parental education and religion are also important, although the white/Hispanic difference in religion works in the opposite direction. The policy implications from these results are not clear as they suggest that racial differences in private school attendance

may partly be due to differences in tastes. Furthermore, this leads to the important point that the income effect may also be due in part to differences in tastes for private school. In this case, vouchers may not have as large of an effect in terms of reducing racial differences in private school rates. In the end, the decompositions cannot provide specific estimates of the subsidies required to equalize private school attendance rates among all groups because they do not provide any evidence on the size of substitution effects created by the introduction of tuition vouchers.

## **6. Racial Segregation in Private Schools**

Are private schools currently more segregated than public schools? The answer to this question is important in that it may provide evidence on potential patterns resulting from voucher programs. I use the NELS sample to investigate this hypothesis.

There are three important issues that guide the analysis. First, the results presented in Tables 1 and 2 indicate that the private school system as a whole is "whiter" than the public school system. This finding, however, does not necessarily imply that private schools are less integrated than public schools. Racial integration must be measured at the individual school level.<sup>13</sup> Second, the racial composition of a school needs to be placed into the context of the racial composition of the surrounding area. For example, a school in the Los Angeles metropolitan area with the same percentage of white students as a school in the Minneapolis metropolitan area implies a different level of segregation. Third, even after controlling for the racial composition of the metropolitan area, the level of integration may differ based on the race of student. For example, a geographical area that has many schools integrated along white/Hispanic racial lines may also have many schools that are segregated along white/black lines.

To address these issues, I use the difference between the racial composition of the student's school and the racial composition of the student's PMSA as a measure of school segregation. I calculate this measure separately for students of each racial group and report the results in Figures 1-3. I only report estimates for the 8th grade due to small 10th-grade sample sizes.<sup>14</sup>

Figure 1 indicates that 21 percent of whites attend public schools that have a similar level of racial integration as their metropolitan areas (defined as being within 5 percentage points). A smaller percentage of whites attending private schools (12 percent) fall within this range. Furthermore, 31 percent of white public school students attend schools that are much "whiter" than their PMSAs (defined as having white shares that are at least 15 percentage points greater than the share of whites in the PMSA). In contrast, 52 percent of white private school students attend schools that have this level of segregation. Overall, the comparison of distributions indicates that white private school students are attending more segregated schools than are white public school students.

Figure 2 provides the same comparison of racial distributions for Hispanic students. In this case, the X-axis measures the difference between the Hispanic share of the student's school and the Hispanic share of the PMSA population. In contrast to the results for whites, Hispanics are attending private schools that are slightly more integrated than public schools. Sixteen percent of Hispanic private school students attend integrated schools compared to 12 percent of Hispanic public school students. Interestingly, however, very large percentages of Hispanics attend public and private schools that are much more "Hispanic" than the surrounding metropolitan area.

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<sup>13</sup> Previous studies argue that racial integration should be measured at the class level due to the presence of tracking (see Chubb and Moe 1996 and Greene 1999 for example). I do not follow this approach because of small black and Hispanic sample sizes.

<sup>14</sup> Estimates are similar, with only a few exceptions, when I use the 10th-grade sample.

Black private school students attend more racially integrated schools than black public school students (see Figure 3). Nineteen percent attend racially integrated private schools, whereas only 7 percent attend racially integrated public schools. In addition, a large percentage of blacks attend public schools that are very "black" (76 percent). In comparison, the percentage of blacks attending private schools with a similar composition is 60 percent, which is smaller, but remains large.

Overall, these estimates indicate that white private school students attend schools that are less integrated than those attended by white public school students. In contrast, Hispanics and blacks attend private schools that are slightly more integrated than public schools. These results, however, should be viewed with some caution due to small sample sizes.

## 7. Conclusions

Using data from the National Educational Longitudinal Study (NELS) and a recently released confidential dataset from the National Center for Educational Statistics (NCES), I examine ethnic and racial patterns of private school attendance. I find that a high level of racial sorting occurs between the private and public school systems. At both the 8th and 10th grade levels, blacks and Hispanics are substantially underrepresented in the private school system. I also find evidence that racial sorting between the private and public school systems is partly due to preferences over the racial composition of schools. In particular, I find that white and Hispanic students enroll in private schools in response to large concentrations of black students, although it is not clear as to whether this is due to personal prejudice or due to other factors. Assuming that these results are due to race (i.e. racism, concerns over peer group effects, etc...) and are not due to a spurious correlation, they provide suggestive evidence that the introduction of private school vouchers, or other forms of increased school choice for that matter, may lead to increased segregation as families have increased opportunities to enroll their children in homogenous schools.

I also examine whether ethnic and racial income disparities contribute to the differences in private school attendance rates. I find that lower levels of income among black and Hispanic families contribute substantially to the underrepresentation of these two groups in the private school system. My estimates indicate that racial disparities in income levels explain 34.9 to 56.7 percent of the white/black gap in the private school attendance rate and 49.7 to 57.5 percent of the white/Hispanic gap in the private school rate.

These findings suggest that the high tuition costs of private schools may limit the opportunities for many blacks and Hispanics to attend these schools. If private school vouchers that are targeted towards low-income families, such as the experimental programs implemented in Milwaukee and Cleveland, essentially reduce the importance of income in determining private school attendance then the level of black and Hispanic underrepresentation in the private school system is likely to decline. This is because a higher percentage of black and Hispanic schoolchildren than white schoolchildren will be eligible to receive private school vouchers.<sup>15</sup> I should note, however, that these findings only imply that the private school system as a whole will be more racially integrated. They do not imply that individual private schools will become more integrated. It is possible that low-income blacks and Hispanics who use their vouchers will attend segregated private schools.<sup>16</sup> Interestingly, however, estimates from NELS indicated that the blacks and Hispanics who currently attend private schools are attending schools that are slightly more integrated than the public schools attended by these groups.

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<sup>15</sup> I am also assuming that the same proportion of qualifying black and Hispanic students as qualifying white students will use the vouchers.

<sup>16</sup> This may be exacerbated by "white flight" from minority schoolchildren within the private school system as more blacks and Hispanics attend private school.

To conclude, the results presented in this paper provide both evidence suggesting that vouchers will lead to increased segregation and evidence suggesting that vouchers will lead to decreased segregation. In the end, it is extremely difficult to predict whether ethnic and racial mixing inside private schools will be high, low or non-existent after a widespread implementation of vouchers. It is equally difficult, to predict the resulting effects on racial segregation in the nation's public schools. Evaluations of experimental voucher programs are necessary for a better understanding of these patterns. In addition, a long-time frame and fairly comprehensive coverage of these programs will be needed to identify the full effects on racial segregation.

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Table 1  
Private School Rates by Race

	8th Grade (1987-88)		10th Grade (1989-90)	
	Rate	N	Rate	N
White, Non-Hispanic	13.2%	16317	11.2%	11537
Black	7.1%	3009	6.9%	1517
Hispanic	9.5%	3171	8.4%	1901

Notes: (1) The private school rate is the fraction of school children enrolled in private school.

(2) All private school rates are calculated using sample weights provided by the NELS.

Table 2  
Racial Composition of Schools

	8th Grade (1987-88)		10th Grade (1989-90)	
	Share	N	Share	N
<b>Public Schools</b>				
White, Non-Hispanic	70.6%	12343	73.7%	9676
Black	14.0%	2565	12.5%	1370
Hispanic	10.7%	2772	9.6%	1759
<b>Private Schools</b>				
White, Non-Hispanic	78.4%	3974	78.7%	1861
Black	7.7%	3009	7.8%	1517
Hispanic	8.2%	3171	7.4%	1901

Note: All shares are calculated using sample weights provided by the NELS.

Table 3  
 Probit Regressions for Probability of Attending Private School  
 Specification

Explanatory Variables	PMSA-Level		County-Level	
	8th Grade (1)	10th Grade (2)	8th Grade (3)	10th Grade (4)
Black	-0.1431 (0.3408)	0.1524 (0.3346)	0.1908 (0.2408)	0.3972 (0.3498)
Hispanic	-0.3929 (0.2489)	-0.3525 (0.2470)	-0.2548 (0.1874)	-0.1237 (0.1841)
Female	0.0133 (0.0263)	-0.0403 (0.0530)	0.0112 (0.0262)	-0.0388 (0.0452)
Number of Siblings	-0.0368 (0.0101)	-0.0381 (0.0137)	-0.0357 (0.0102)	-0.0415 (0.0131)
Baptist	-0.0651 (0.1283)	-0.3246 (0.1719)	-0.0654 (0.1157)	-0.2757 (0.1485)
Methodist	-0.1461 (0.1274)	-0.3186 (0.1714)	-0.1204 (0.1134)	-0.2934 (0.1484)
Lutheran	0.0680 (0.1450)	-0.2346 (0.1656)	0.1477 (0.1348)	-0.2184 (0.1539)
Other Christian	0.2265 (0.1021)	0.0464 (0.1496)	0.2443 (0.1003)	0.0725 (0.1311)
Catholic	0.7110 (0.1217)	0.4356 (0.1543)	0.7471 (0.1127)	0.4455 (0.1512)
Jewish	0.3880 (0.1528)	0.2561 (0.1866)	0.3674 (0.1659)	0.2139 (0.2029)
Other Religion	-0.1455 (0.1212)	-0.2643 (0.1918)	-0.1051 (0.1228)	-0.1647 (0.1561)
Mother Graduated from High School	0.3153 (0.0669)	0.1660 (0.0829)	0.3297 (0.0598)	0.1829 (0.0845)
Mother Has some College	0.4301 (0.0706)	0.2935 (0.0926)	0.4360 (0.0616)	0.3158 (0.0844)
Mother Graduated from College	0.6419 (0.0673)	0.5084 (0.0906)	0.6569 (0.0689)	0.5196 (0.0934)
Father Graduated from High School	0.1568 (0.0477)	0.2405 (0.0712)	0.1847 (0.0472)	0.2413 (0.0826)
Father Has some College	0.1728 (0.0529)	0.2967 (0.0775)	0.2172 (0.0510)	0.3317 (0.0892)
Father Graduated from College	0.4246 (0.0624)	0.5957 (0.0955)	0.4363 (0.0586)	0.6157 (0.0961)
Family Income: \$15,000 to \$25,000	0.1880 (0.0514)	0.2211 (0.0808)	0.2022 (0.0498)	0.2729 (0.0877)
Family Income: \$35,000 to \$50,000	0.4136 (0.0677)	0.3913 (0.0866)	0.4469 (0.0602)	0.4714 (0.0863)

(continued)

Table 3 (continued)  
 Probit Regressions for Probability of Attending Private School  
 Specification

Explanatory Variables	PMSA-Level		County-Level	
	8th Grade (1)	10th Grade (2)	8th Grade (3)	10th Grade (4)
Family Income: \$50,000 to \$100,000	0.4141 (0.0776)	0.4947 (0.0981)	0.4605 (0.0688)	0.5850 (0.0922)
Family Income more than \$100,000	1.2233 (0.1289)	1.3654 (0.1316)	1.2310 (0.0990)	1.4484 (0.1136)
Public School Student to Teacher Ratio	0.0511 (0.0279)	0.1100 (0.0376)	0.0496 (0.0238)	0.1069 (0.0279)
Public School Expenditures per Pupil (000s)	0.1025 (0.0523)	0.1230 (0.0679)	0.1060 (0.0511)	0.1351 (0.0551)
Private School Student to Teacher Ratio	-0.0066 (0.0319)	-0.0539 (0.0390)	0.0080 (0.0274)	-0.0455 (0.0297)
Serious Crime Rate	-3.9998 (2.5809)	1.0843 (3.8899)	-0.7825 (1.9793)	0.1011 (2.4329)
Poverty Rate (Ages 5-17)	1.6105 (0.9223)	0.5691 (1.2242)	1.4773 (0.6628)	0.9804 (0.8460)
Distance to Closest Private School (Km)	-0.0461 (0.0081)	-0.0459 (0.0084)	-0.0409 (0.0057)	-0.0361 (0.0065)
Distance Squared / 100	0.0197 (0.0042)	0.0176 (0.0044)	0.0175 (0.0037)	0.0123 (0.0043)
White * Black Share of Population (Ages 5-18)	1.5264 (0.6314)	2.0742 (0.7264)	1.9140 (0.4382)	2.5453 (0.5231)
White * Hispanic Share of Population (Ages 5-18)	-1.7898 (0.7925)	-2.3158 (1.0421)	-1.3534 (0.5254)	-1.6366 (0.6856)
Black * Black Share of Population (Ages 5-18)	1.5607 (1.0762)	1.2590 (1.0575)	0.3073 (0.6125)	0.3343 (0.7570)
Black * Hispanic Share of Population (Ages 5-18)	-1.0158 (1.1688)	-1.5427 (1.1512)	-0.8487 (0.8820)	-0.9412 (1.0905)
Hispanic * Black Share of Population (Ages 5-18)	2.6581 (0.9503)	2.6089 (0.9378)	1.9701 (0.5646)	2.2321 (0.6115)
Hispanic * Hispanic Share of Population (Ages 5-18)	-1.5671 (0.7128)	-1.7056 (0.9049)	-1.4706 (0.5269)	-1.6660 (0.6594)
Mean of Dependent Variable	0.1435	0.1251	0.1150	0.0958
Avg. Derivative Adj. Factor	0.1770	0.1566	0.1433	0.1186
Sample Size	13884	9006	17853	12076

Notes: (1) The sample consists of white, black, and Hispanic schoolchildren. (2) Standard errors are reported in parentheses and are adjusted for including multiple observations per PMSA or county. (3) All estimates are adjusted for oversample of private school students. (4) In addition to the reported variables, all specifications include a constant and dummy variables for age, and missing mother's and father's education levels. (5) The average derivative (or marginal effect) is equal to the adjustment factor multiplied by the coefficient. See text for more details.

Table 4  
 Probit Regressions for Probability of Attending Private School  
 Specification

Explanatory Variables	PMSA-Level		County-Level	
	8th Grade (1)	10th Grade (2)	8th Grade (3)	10th Grade (4)
Feel It Is Okay to Make Racist Remarks	-0.1269 (0.1238)	-0.0896 (0.1457)	-0.1382 (0.0890)	-0.0449 (0.1037)
Black Share	1.8981 (0.6751)	2.0230 (0.7466)	1.9798 (0.5142)	2.4695 (0.5694)
Black Share * Racist Remarks	0.7036 (0.5514)	0.3886 (0.6247)	0.5889 (0.3633)	0.2152 (0.3715)
Hispanic Share	-1.2197 (0.9145)	-2.3138 (1.1342)	-1.2903 (0.6656)	-1.7501 (0.7648)
Hispanic Share * Racist Remarks	0.1053 (0.4652)	0.5485 (0.5592)	-0.0636 (0.4063)	0.2509 (0.4856)
Avg. Derivative Adj. Factor	0.1768	0.1716	0.1326	0.1266
Mean of Dependent Variable	0.1424	0.1438	0.1071	0.1076
Sample Size	7063	6901	9736	9472

Notes: (1) The sample consists of white school children. (2) See notes for Table 3.

Table 5  
Means of Analysis Variables  
8th Grade - PMSA Level

	White	Hispanic	Black
Private School Probability	0.1639	0.1142	0.0768
Born in 1972 or 1973	0.3179	0.3949	0.4248
Female	0.4986	0.5277	0.5106
Number of Siblings	2.0963	2.7859	2.5505
Baptist	0.1735	0.0607	0.5921
Methodist	0.0949	0.0196	0.0962
Lutheran	0.0757	0.0095	0.0030
Other Christian	0.2346	0.1364	0.1382
Catholic	0.3377	0.7194	0.0900
Jewish	0.0300	0.0058	0.0010
Other Religion	0.0298	0.0356	0.0628
Mother Graduated from High School	0.2934	0.1959	0.2500
Mother Has some College	0.4127	0.3239	0.4664
Mother Graduated from College	0.2011	0.0786	0.1000
Father Graduated from High School	0.2207	0.1671	0.2763
Father Has some College	0.3450	0.2662	0.2825
Father Graduated from College	0.3065	0.1269	0.1290
Family Income: \$15,000 to \$25,000	0.1490	0.2286	0.2185
Family Income: \$25,000 to \$35,000	0.1887	0.1685	0.1406
Family Income: \$35,000 to \$50,000	0.2546	0.1482	0.1057
Family Income: \$50,000 to \$100,000	0.2456	0.0988	0.1032
Family Income more than \$100,000	0.0554	0.0153	0.0070
Public School Student-Teacher Ratio	17.8568	19.2848	17.9450
Public School Expenditures per Pupil	5.2791	5.2534	5.3276
Private School Student-Teacher Ratio	14.6029	14.5475	14.0713
Serious Crime Rate	0.0584	0.0715	0.0660
Poverty Rate (Ages 5-17)	0.1683	0.3129	0.1965
Distance to Closest Private School (km)	4.0423	2.5018	1.8386
Sample Size	10020	1986	1878

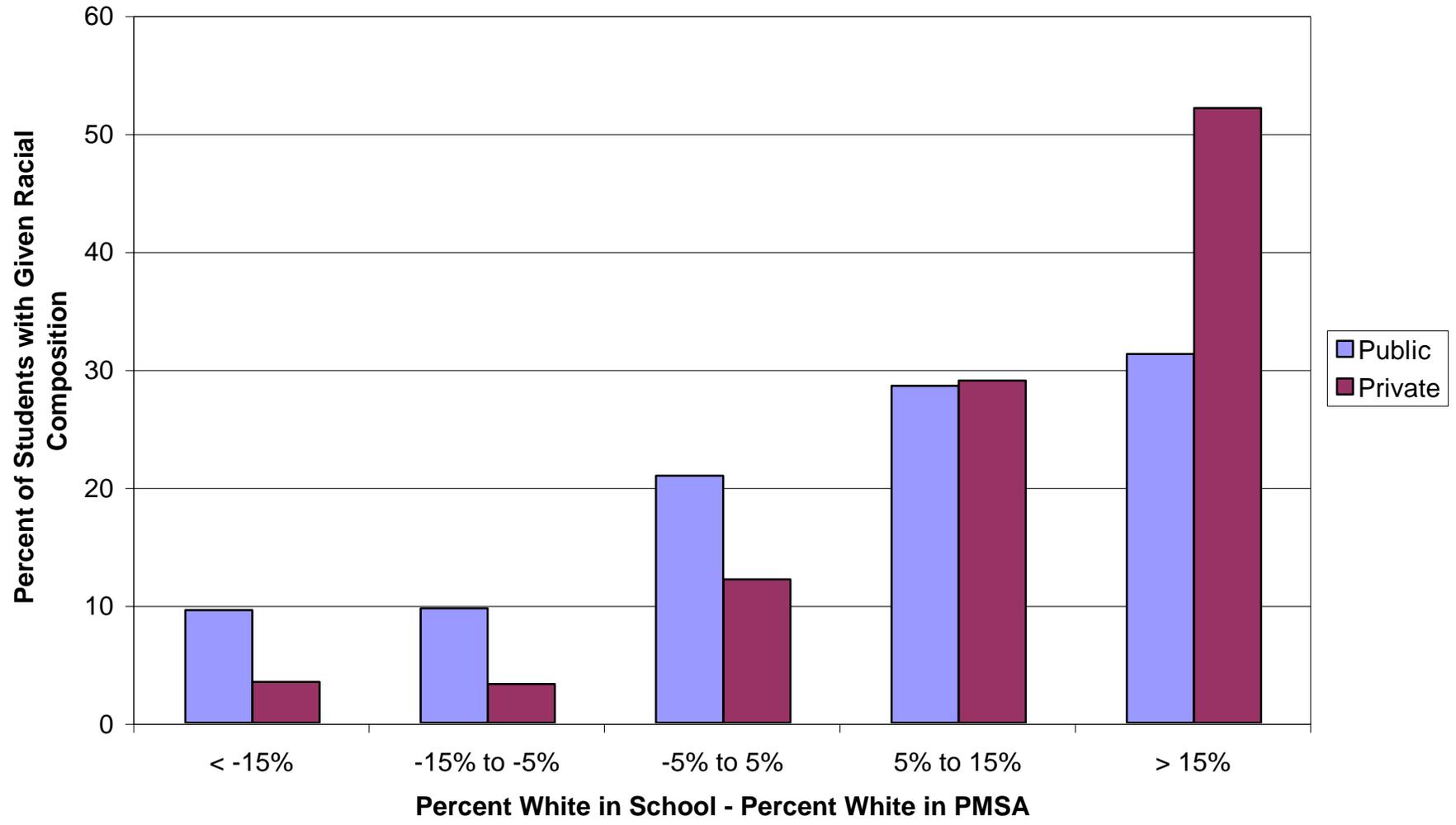
Note: The samples are based on the sample used in Specification 1 of Table 3.

Table 6  
Decomposition of Racial Differences in Private School Rates

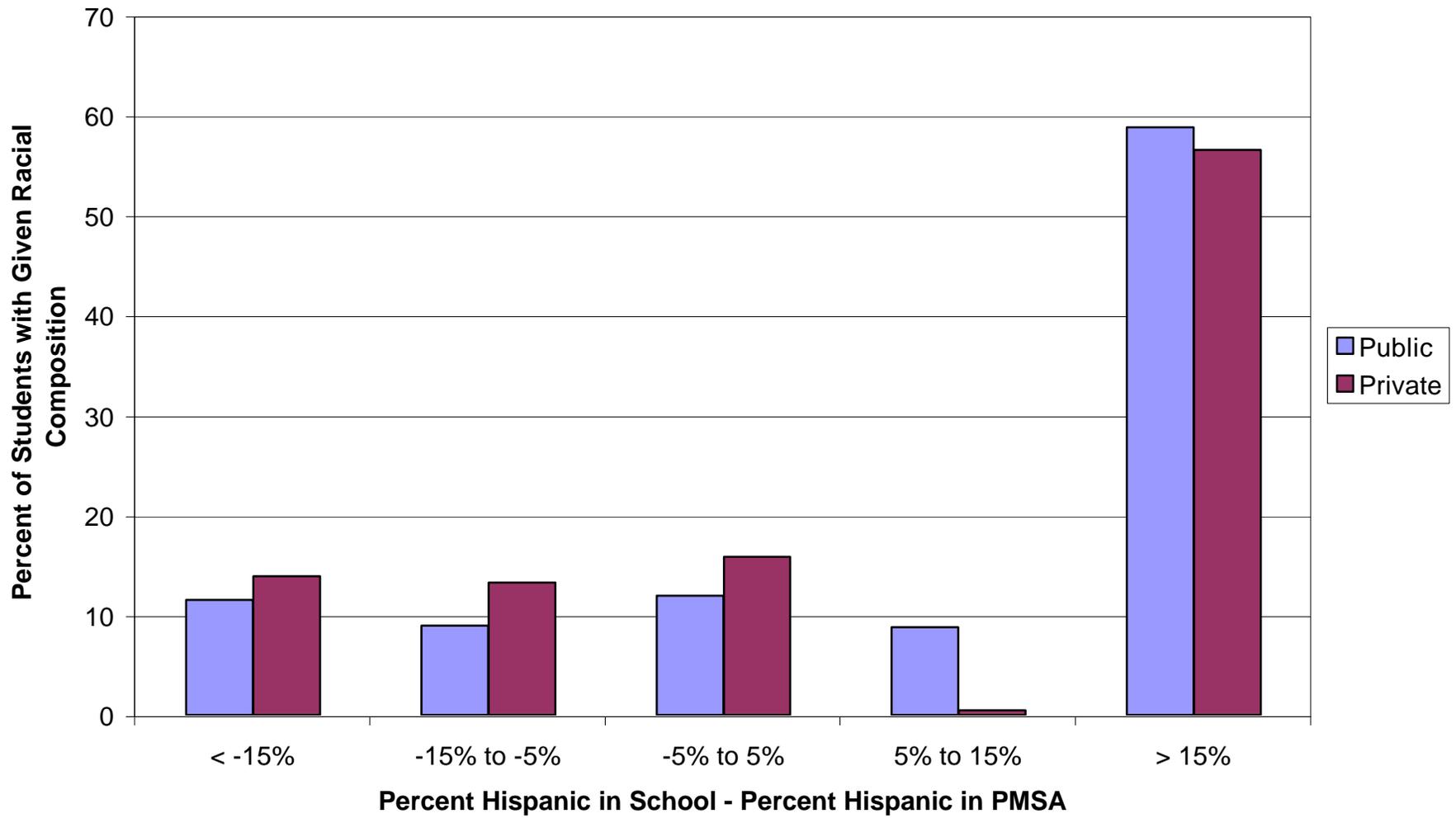
Group	Private School Rate	Gap	Contributions from Group Differences in:					
			Controls	Religion	Parental Education	Family Income	School / Geog. Chars.	Private School Distance
I. 8th Grade, PMSA-Level								
Blacks	0.0768	0.0872	0.0050	0.0371	0.0205	0.0305	0.0022	-0.0106
			5.7%	42.6%	23.5%	34.9%	2.5%	-12.2%
Hispanics	0.1142	0.0497	0.0059	-0.0499	0.0319	0.0247	0.0027	-0.0072
			12.0%	-100.0%	64.1%	49.7%	5.4%	-14.6%
II. 10th Grade, PMSA-Level								
Blacks	0.0882	0.0533	0.0028	0.0317	0.0198	0.0302	-0.0067	-0.0074
			5.2%	59.5%	37.1%	56.7%	-12.6%	-13.9%
Hispanics	0.0941	0.0474	0.0041	-0.0351	0.0277	0.0273	-0.0053	-0.0068
			8.6%	-73.9%	58.4%	57.5%	-11.2%	-14.4%

Notes: (1) The samples are based on those reported in Table 3. (2) See text for more details on calculation of decompositions. (3) The controls include age, sex, and number of siblings.

**Figure 1**  
**Racial Composition of Private and Public Schools Attended by White Students**  
**NELS 8th Grade**



**Figure 2**  
**Racial Composition of Private and Public Schools Attended by Hispanic Students**  
**NELS 8th Grade**



**Figure 3**  
**Racial Composition of Private and Public Schools Attended by Black Students**  
**NELS 8th Grade**

