

EDUCATION

The Stanford Center on Poverty and Inequality

BY SEAN F. REARDON

KEY FINDINGS

- White-black and white-Hispanic academic achievements gaps have narrowed by 30–40 percent in the last four decades and continue to narrow today in most states, albeit slowly. Nonetheless, these achievement gaps remain very large.
- Gaps in both achievement and educational completion vary considerably among states. For example, the Hispanic-white and black-white ratios in college completion are as low as 0.27 and 0.38, respectively, in Colorado, but as high as 0.74 and 0.76, respectively, in West Virginia.
- The size of a state's racial achievement gaps is strongly related to the extent of racial socioeconomic disparities in the state's population. States where racial differences in income, educational attainment, poverty, and unemployment are large tend to have the largest racial achievement gaps.
- Nonetheless, socioeconomic disparities do not fully account for achievement gaps. Unequal access to quality schools likely contributes to the gaps.

At the fiftieth anniversary of the Elementary and Secondary Education Act, which was intended to eliminate achievement gaps between poor and non-poor children and between black and white children, it is useful to examine the progress we have made in achieving those goals. In this report, I examine how the states have fared in eliminating racial gaps in both achievement and college completion, although obviously a full account of educational inequality would, at minimum, require an examination of socioeconomic gaps as well. Given that deep racial gaps in educational achievement figure so prominently in the American story of education, a careful examination of where we stand, some 50 years after one of the key equalizing interventions, is surely warranted.

I lead off with a brief overview of national trends in achievement gaps, in order to provide historical context for the analyses that follow. Next, I examine the current size of racial achievement and educational attainment gaps in each of the states, asking “Does the fate of a black or Hispanic child depend on the state into which she or he happens to be born?”

In the final section, I explore the causes of racial achievement gaps. Although a full assessment of their causes is beyond the scope of this report, I provide some key evidence here regarding the extent to which we should “blame” state education policy for the gaps. Specifically, I describe the associations between achievement gaps and the relative socioeconomic status of blacks, Hispanics, and whites. If achievement gaps are strongly

correlated with racial socioeconomic disparities, this suggests that reducing these gaps may be best approached by addressing the labor market, neighborhood, and related institutions that generate those socioeconomic gaps in the first place. If, on the other hand, the gaps are very large even for blacks, Hispanics, and whites from families of the same socioeconomic standing, and if gaps vary substantially even among states with similar racial socioeconomic disparities, then it may be that states' educational systems and institutions are contributing to inequality.¹ To the extent that this is the case, we should take a long and hard look at how these achievement gaps are being generated, with one of the main hypotheses being that differences in school quality are to be blamed.

Trends in Racial Academic Achievement Gaps

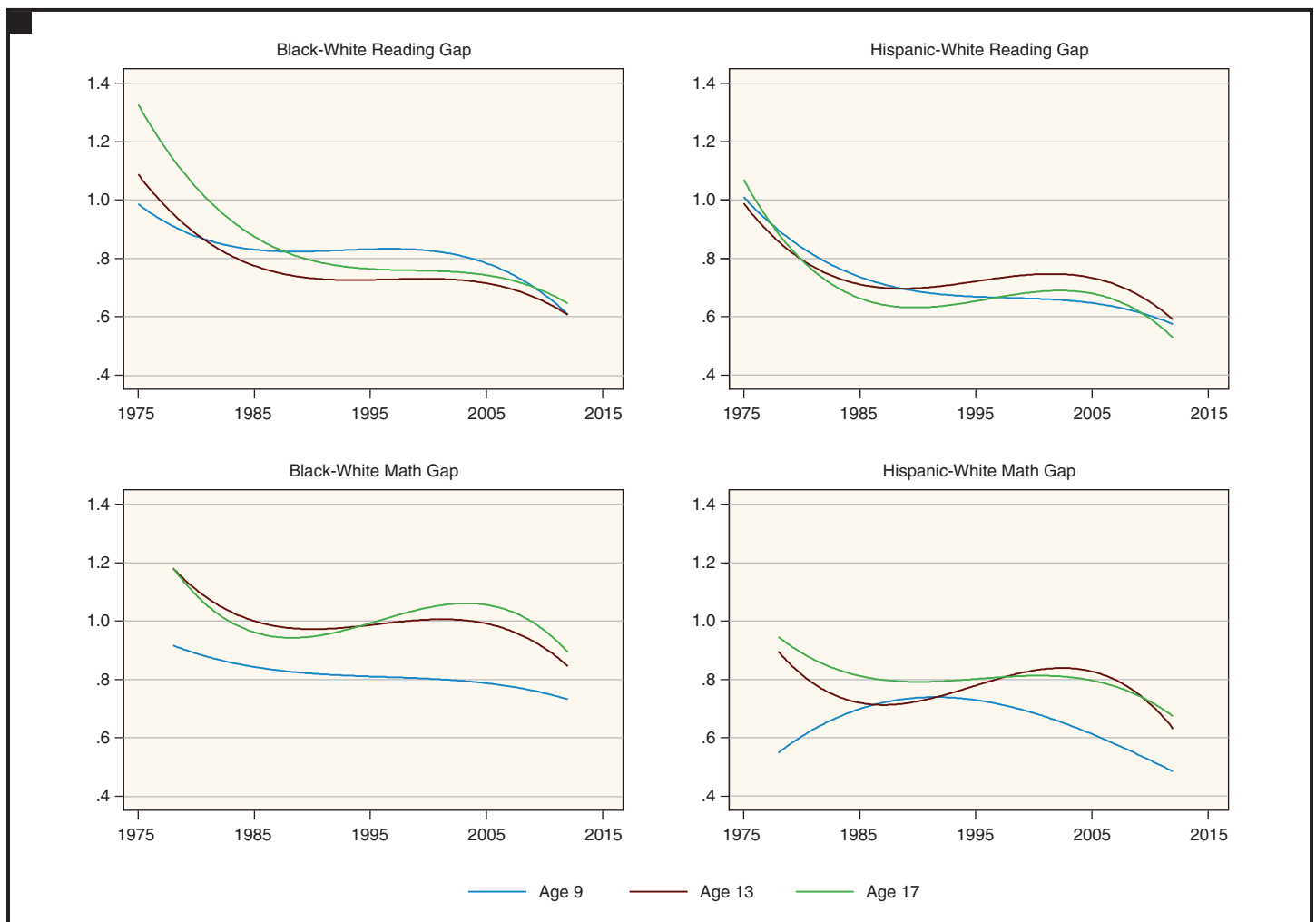
I begin, then, by examining national trends in achievement gaps. One of the success stories in U.S. education is the substantial narrowing of racial achievement gaps over the last four decades. In the 1970s, when the first National Assessment of Educational Progress (NAEP) tests (now known as “the Nation's Report Card”) were administered, the white-black achievement gaps in reading and math were over a standard deviation. Today, these gaps are smaller by 25–50 percent (see Figure 1), though they are still far from eliminated. The same long-term trend is evident in white-Hispanic achievement gaps. On the whole, racial achievement gaps have narrowed significantly over the last four decades.

Nonetheless, our progress in narrowing racial achievement gaps has been uneven, and the gaps are still quite large despite this progress. Most of the reduction in racial achievement gaps occurred in the 1970s and early 1980s; progress stalled or even reversed from the mid-1980s through the 1990s. More recently, however, the gaps have begun to narrow again. This recent trend is evident in the Long-Term Trend NAEP data shown in Figure 1, as well as in the so-called Main NAEP tests, a newer version of the NAEP tests that has been administered since 1990,² and in state accountability tests.³ Both white-black and white-Hispanic gaps have narrowed by roughly two-tenths of a standard deviation in the last two decades.

State Variation in Racial Gaps

I turn next to state-level variation in racial achievement gaps. Figure 2 shows average scores in 2013 on the NAEP eighth-grade math tests in each state, broken down by race. The first but very important pattern that is clear here is that there is considerable variation among states in the size of these gaps. It is further evident from Figure 2 that there is not only a great deal of variation in the size of the gaps, but there is also considerable variation across states in each group’s average scores. For example, although the black-white and Hispanic-white gaps in Texas are roughly the same size as those in Florida and Oklahoma, white, black, and Hispanic students in Texas score much higher than their counterparts in Florida, who in turn score much higher than Oklahoma students of the

FIGURE 1. Trends in Racial Achievement Gaps, 1975–2013



Source: Author’s calculations from Long-Term Trend NAEP (NAEP-LTT). Gaps here are measured relative to the age- and cohort-specific national standard deviation of scores. This standard deviation has changed very little over time. The NAEP-LTT tests have been administered to nationally representative samples of 9-, 13-, and 17-year-olds roughly every four years from 1971–2012. The racial gap trend shown is the fitted curve from a precision-weighted least squares regression of gaps on a cubic function of test administration year. Each gap is weighted by the inverse of its estimated sampling variance.

same races. Indeed, Hispanic students in Texas score slightly higher, on average, than white students in Oklahoma.

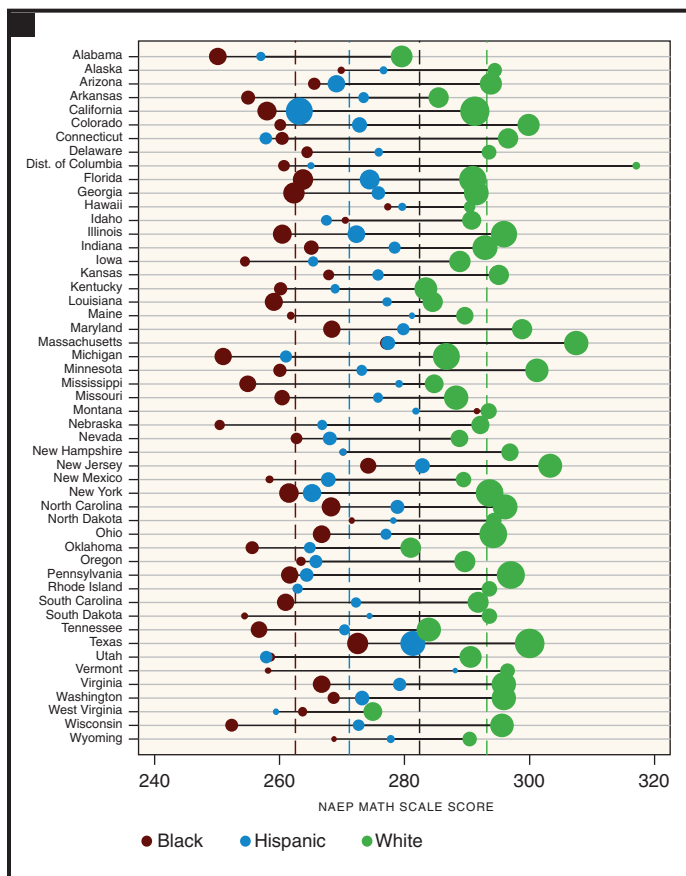
One might also ask whether educational attainment gaps, such as gaps in college completion rates, also vary among states. Figure 3 shows that indeed they do. This figure, based on data pooled from the 2003–2013 American Community Surveys, presents the proportion of 25- to 29-year-olds who have completed college in each state. We again find evidence of large racial gaps and considerable state-level variability in the size of those gaps. For example, the Hispanic-white and black-white ratios in Colorado are as low as 0.27 and 0.38, respectively, whereas the corresponding ratios in West Virginia are as high as 0.74 and 0.76, respectively.

Socioeconomic Inequality and Achievement Gaps

Are these racial gaps due to inequities in the quality of schools available to children of different racial groups? Or are they instead due to outside-of-school inequities related to family and neighborhood socioeconomic conditions and resources? I take on this question next (focusing here specifically on gaps in academic achievement).

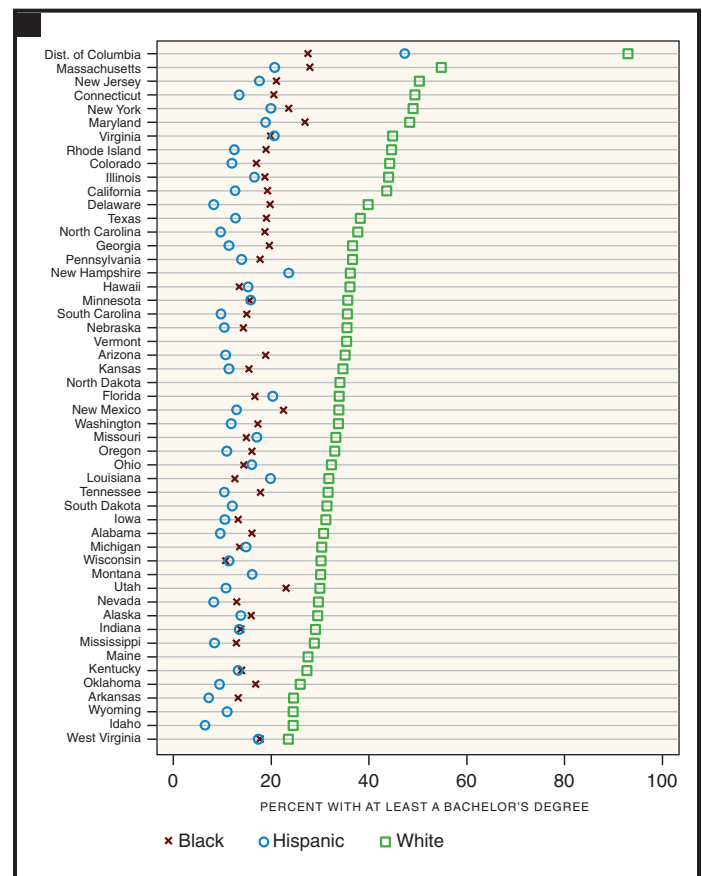
One way to answer this question is to examine the association between the size of achievement gaps within a state and the extent of racial disparities in socioeconomic status. If social inequalities in family background are the primary drivers of achievement gaps, then we would expect state racial achievement gaps to be highly correlated with the size

FIGURE 2. White, Black, and Hispanic Average NAEP Scores by State, Grade 8 Math, 2013



Source: National Assessment of Educational Progress and Common Core of Data (for enrollment counts). In a few cases where population counts are small, data were not available for 2013, so 2011 values are used instead. Dots are roughly proportional in size to the square root of the total state eighth-grade enrollment of the relevant group. Vertical dashed lines indicate national average NAEP scores of black, Hispanic, total, and white students, respectively.

FIGURE 3. College Completion Rates, by State and Race, 25- to 29-Year-Olds, 2003–2013



Source: American Community Survey 2003–2013 (Ruggles et al., 2010). “Black” is non-Hispanic black. “Hispanic” includes Hispanics of any race. White is non-Hispanic white. Proportions are estimated from unweighted sample counts; cells with less than 100 observations not shown.

of racial differences in income, parental education, poverty rates, and the like. And if this is the case, achievement gaps may be hard to narrow without improving economic conditions for black and Hispanic families and reducing residential segregation and the concentration of poverty. On the other hand, if the association between achievement gaps and racial socioeconomic disparities is weak, there may be useful lessons to be learned from states with high levels of socioeconomic inequality between races, but with relatively low achievement gaps.

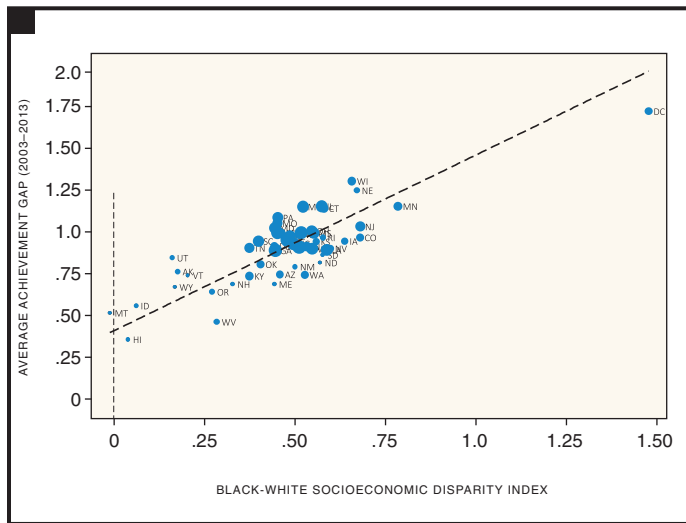
Figures 4 and 5 below present these associations. Each figure shows the white-black (Figure 4) or white-Hispanic (Figure 5) achievement gap in eighth-grade mathematics in a state, plotted against an index of racial socioeconomic disparities in the state. In the interest of saving space, I show only the eighth-grade math figures, but the patterns are very similar in fourth grade and in reading test gaps as well. All of the achievement gap patterns can be explored interactively on our achievement gaps website.⁴

The achievement gaps and racial disparities indices are computed by averaging data from 2003–2013. Achievement gaps are measured in standard deviation units. The socioeconomic

disparities index is a weighted average of racial differences in income, educational attainment, poverty rates, and unemployment rates, each among parents of school-age children in the state. An index of 0 would mean that white and black parents of school-age children in the state have equal incomes, levels of educational attainment, poverty rates, and unemployment rates. Thus, if socioeconomic disparities are the main source of achievement gaps, we would expect the achievement gap to be 0 for states with no racial socioeconomic disparities and to be large for states with large disparities.

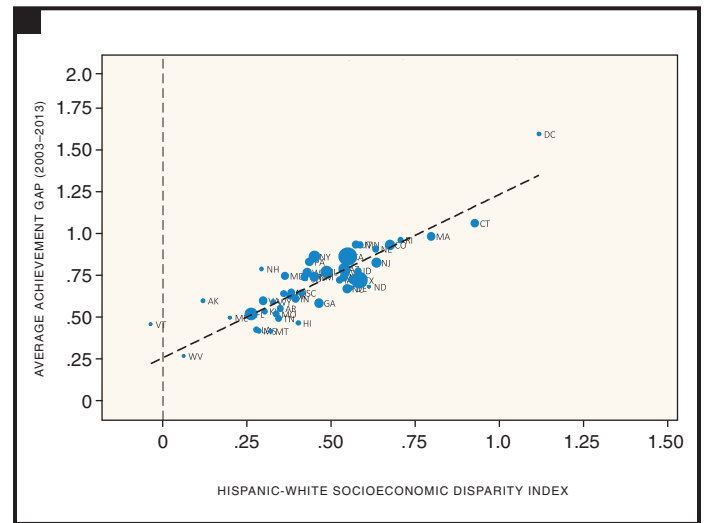
The first finding evident in Figures 4 and 5 is that white-black and white-Hispanic achievement gaps are, on average, very large. This is also apparent in Figure 2, but it comes out even more clearly here. As shown in Figures 4 and 5, there are no states where these gaps are smaller than one-quarter of a standard deviation; in most states, they are much larger. The white-black gaps average 0.93 standard deviations in math and 0.74 standard deviations in reading (not shown, though available on our achievement gaps website); the white-Hispanic gaps are smaller, but still large, averaging 0.73 standard deviations in math and 0.61 standard deviations in reading (not shown). Although the average gaps are large, they vary substantially across states, which was also evident in Figure

FIGURE 4. Association between Black-White Achievement Gaps and Socioeconomic Disparities, Grade 8 Math, 2003–2013



Source: Author's calculations from 2003–2013 Main NAEP, Current Population Survey (CPS), and the Common Core of Data. Achievement gap estimates shown here are precision-weighted averages of NAEP gaps in years 2003–2013, adjusted for the linear trend in gaps from 2003–2013. The socioeconomic disparity index is the value of XB from the regression model $G_s = \beta_0 + X_s B + U_s$, where G_s is the average gap in the state, and X is a vector of four variables: the white-black family income gap, the white-black disparity in parental educational attainment, the black-white poverty rate ratio, and the black-white unemployment ratio, all of which are calculated from CPS data on the parents of school-age children in each state and averaged from 2003–2013. That is, the socioeconomic disparity index is equal to the gap predicted by the regression model, minus the intercept; it has a value of 0 if white and black families have identical average incomes, educational attainment, poverty rates, and unemployment rates in a state. The size of the bubbles in the figure is proportional to the square root of the average black student K–12 enrollment in the state from 2003–2013.

FIGURE 5. Association between Hispanic-White Achievement Gaps and Socioeconomic Disparities, Grade 8 Math, 2003–2013



Source: Author's calculations from 2003–2013 Main NAEP, Current Population Survey (CPS), and the Common Core of Data. The size of the bubbles in the figure is proportional to the square root of the average black student K–12 enrollment in the state from 2003–2013. See Figure 4 for detailed information.

TABLE 1. Average Racial Socioeconomic Disparities, U.S. States, 2003–2013

	White-Black		White-Hispanic	
	Mean	(sd)	Mean	(sd)
Standardized Income Difference	0.82	(0.39)	0.77	(0.27)
Standardized Educational Attainment Difference	0.56	(0.38)	0.89	(0.36)
Poverty Rate Ratio	3.2	(1.5)	2.9	(1.0)
Unemployment Rate Ratio	2.3	(1.4)	1.8	(0.9)

Source: Author's calculations from Current Population Survey (CPS), 2003–2013. The income difference is measured using the V statistic (Ho and Reardon, 2012) to compare the white and black income distributions among families with school-age children; it can be interpreted as the difference in incomes between white and black/Hispanic families, measured in pooled income standard deviation units. The educational attainment difference is computed as the difference in years of education, measured in pooled educational attainment standard deviation units using the V statistic. The poverty and unemployment ratios are the ratios of black or Hispanic poverty or unemployment rates to the corresponding rates of whites.

2 above. Roughly 10 percent of states have white-black gaps larger than 1 standard deviation; a similar number have gaps smaller than half a standard deviation. Washington, D.C., is a significant outlier here, with white-black and white-Hispanic gaps of well over 1.5 standard deviations.

These figures also reveal that the racial socioeconomic disparities index is large on average, but varies considerably among states. To get a sense of the magnitude of this index, consider Table 1, which describes the components of the index. On average, black and Hispanic students have parents with incomes roughly 0.80 standard deviations lower than those of white students in the same state; their parents have educational attainment levels 0.56 (black students) or 0.89 (Hispanic students) standard deviations below those of whites; and their parents have poverty rates and unemployment rates two to three times higher than those of white students. There is, however, considerable variation in these differences. In Connecticut, for example, the Hispanic-white income and educational disparities are 1.2 standard deviations; the poverty ratio is 6.1. Florida, in contrast, has Hispanic-white income and educational disparities of roughly 0.50 standard deviations, and a poverty ratio of 2.2. Despite this variation, in no state are Hispanic-white socioeconomic disparities equal to 0; and black-white disparities are near zero in only three states with very few black residents: Montana, Idaho, and Hawaii.

Figures 4 and 5 clearly show that racial socioeconomic disparities are strongly related to achievement gaps. States with larger racial disparities in family socioeconomic resources have, on average, larger racial achievement gaps. The associations are somewhat stronger for the Hispanic-white gaps (correlation = 0.84) than the black-white gaps (correlation = 0.68). The very large achievement gaps in Washington, D.C.,

for example, are largely explained by its extraordinarily large racial disparities in income (e.g., white-black difference = 1.7 standard deviations), education (e.g., white-black difference = 2.3 standard deviations), poverty (black/white ratio = 10.7), and unemployment (black/white ratio = 9.4). The strong association between socioeconomic disparities and achievement gaps suggests that poverty and inequality are powerful factors shaping children's educational opportunities and success.

The final notable feature of Figures 4 and 5 is that, despite the strong association between socioeconomic conditions and achievement gaps, socioeconomic disparities do not fully account for all of the variation across states in the gaps. Some states with similar levels of black-white socioeconomic disadvantage, like Wisconsin and New Jersey, have significantly different black-white achievement gaps (about 0.25 standard deviations different, in this example). Hispanics in New York and in Georgia are roughly equally disadvantaged relative to white students in their states, but the Hispanic-white achievement gap is one-quarter of a standard deviation smaller in Georgia than in New York. In addition, even in states with very small or zero racial socioeconomic disparities (such as Hawaii, Montana, and Idaho), the black-white achievement gap is still quite large. These patterns suggest that there are other important factors at play in shaping educational opportunity and academic achievement gaps.

Conclusion

There is a long-running debate among educators and policymakers about whether schools can counteract social inequalities in children's families and neighborhoods. Some point to specific successful schools and school-based interventions as evidence that high-quality schooling can substantially reduce or eliminate socioeconomic or racial disparities in academic performance. Others argue that the

injuries of poverty, particularly in early childhood, cannot be fully overcome by school-based strategies, given the high levels of economic inequality in the United States. The reality is that both are true. The schooling system in the United States can—and does in some cases—reduce educational inequality. But it has not eliminated—and likely cannot eliminate—educational inequality, though it could certainly be

more effective at doing so than it has been. The fact that a large part of states' achievement gaps can be accounted for by their racial socioeconomic disparities suggest that out-of-school factors play a sizable role in shaping achievement gaps. Without more directly reducing these socioeconomic disparities, we are unlikely to be able to fully eliminate inequality in educational outcomes. ■

NOTES

1. Of course, some of the socioeconomic differences among parents are likely themselves due to educational policies that were in place when they were growing up, so this analysis is far from definitive regarding the extent to which educational systems contribute to achievement gaps.

2. See, for example, Hemphill et al., 2011; Reardon et al., forthcoming; Vanneman et al., 2009.

3. Reardon et al., 2013.

4. The achievement gaps website is available at <http://inequality.com/sotu>.

ADDITIONAL RESOURCES

Hemphill, F. Cadelle, Alan Vanneman, and Taslima Rahman, T. 2011. *Achievement Gaps: How Hispanic and White Students in Public Schools Perform in Mathematics and Reading on the National Assessment of Educational Progress*. NCES 2011-459. Washington, D.C.: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education.

Ho, Andrew D., and Sean F. Reardon. 2012. "Estimating Achievement Gaps From Test Scores Reported in Ordinal 'Proficiency' Categories." *Journal of Educational and Behavioral Statistics*, 37(4), 489–517.

Reardon, Sean F., Joseph P. Robinson-Cimpian, and Ericka S. Weathers. Forthcoming. "Patterns and Trends in Racial/Ethnic and Socioeconomic Academic Achievement Gaps." In *Handbook of Research in Education Finance and Policy*, Second Edition (H. Ladd & M. Goertz, Eds.). New York: Routledge.

Reardon, Sean F., Rachel A. Valentino, Demetra Kalogrides, Kenneth A. Shores, and Erica H. Greenberg. 2013. *Patterns and Trends in Racial Academic Achievement Gaps Among States, 1999–2011*. Working Paper. Stanford, CA: Center for Education Policy Analysis, Stanford University.

Ruggles, Steven J., J. Trent Alexander, Katie Genadek, Ronald Goeken, Matthew B. Schroeder, and Matthew Sobek. 2010. *Integrated Public Use Microdata Series: Version 5.0*. Machine-readable database. Minneapolis: University of Minnesota.

Vanneman, Alan, Linda Hamilton, Janet Baldwin Anderson, and Taslima Rahman. 2009. *Achievement Gaps: How Black and White Students in Public Schools Perform in Mathematics and Reading on the National Assessment of Educational Progress*. NCES 2009-455. Washington, D.C.: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education.