

EDUCATION

The Stanford Center on Poverty and Inequality

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KEY FINDINGS

- White-black and white-Hispanic academic achievement gaps have narrowed by roughly 40% in the last four decades, and continue to narrow today in most states, although slowly. Nonetheless, these achievement gaps remain very large.
- The achievement gap between children from high- and low-income families has widened by roughly 40% in the last three decades. It is now considerably larger than the racial achievement gaps.
- Recent evidence suggests that racial disparities in high school graduation rates have declined sharply in the last decade; the difference in graduation rates is now half the size it was forty years ago.
- Nonetheless, black and Hispanic students are still much less likely to earn a bachelor's degree or to enroll in a highly selective college than are white students. These gaps in high levels of educational attainment have changed little in the last few decades.
- Likewise, low-income students are substantially underrepresented in selective four-year colleges. This pattern appears to be more pronounced today than it was three decades ago.

Sixty years ago, the Supreme Court declared *de jure* racial segregation of schools unconstitutional. Forty-nine years ago, Congress passed the Elementary and Secondary Education Act, which was designed in part to eliminate the achievement gap between poor and non-poor children by providing additional funding to schools enrolling large proportions of low-income students. Both of these acts, as well as many other legislative, judicial, and policy changes in the 1960s, 1970s, and later, were intended to equalize educational opportunity for students—students from low-income families and black students—who historically had little access to high quality schools. The success of these and related efforts has been mixed.

The goal in this brief is to summarize the trends in educational equity over the last several decades. I consider educational equity in relation to race and ethnicity and family income. Certainly, these are not the only relevant dimensions for a discussion of educational equity, but because they link characteristics of a child's family to his or her educational success, they are particularly relevant for a better understanding of social mobility.

In principle, it is useful to consider two types of measures of educational equity: first, measures of educational opportunity and experiences, such as school quality, access to high quality teaching, and rigorous curricula, and second, measures of educational outcomes, such as performance on standardized tests, high school graduation, and college enrollment and completion. The for-

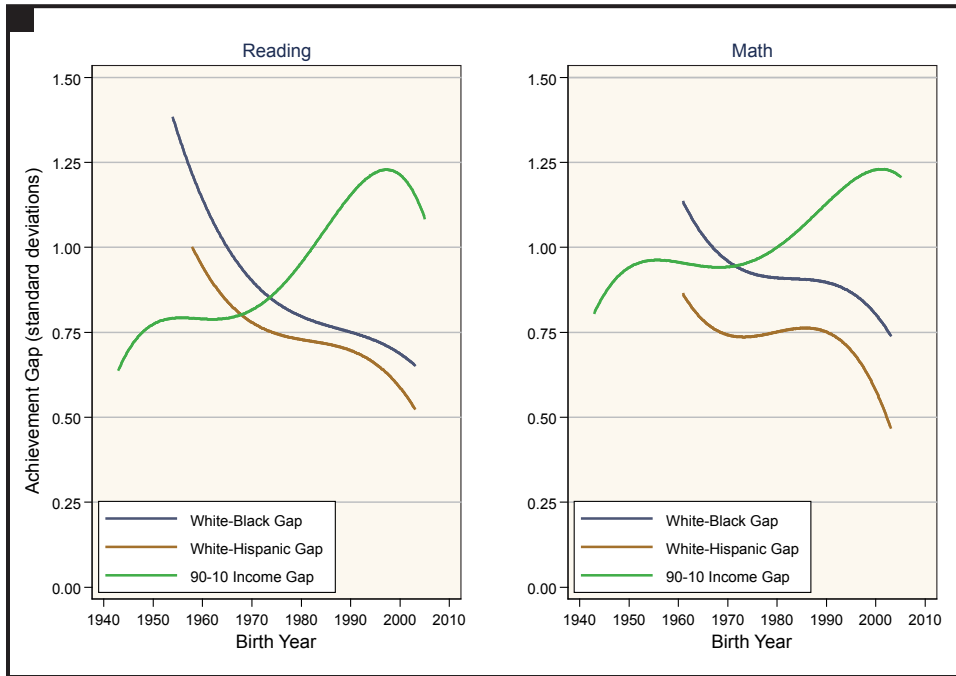
mer is more difficult to measure, because historically we haven't collected systematic data on the quality of education children receive. As rough proxies for equality of educational opportunity, researchers typically look at patterns of segregation, school funding, and pupil-teacher ratios, but these are far from ideal measures and are generally only weakly related to educational outcomes. Because a full discussion of the complexities involved in measuring equality of educational experiences is beyond the scope of this brief, I will focus my attention here on measures of equality of educational outcomes, including academic achievement, high school graduation, and college enrollment.

Trends in Academic 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 early 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 gap in reading was well over one and a quarter standard deviations. That same gap today is half that size (see Figure 1). The same long-term trend is evident in mathematics as well, and in the white-Hispanic gaps in both math and reading. On the whole, racial achievement gaps have narrowed by roughly 40 percent over the last four decades.

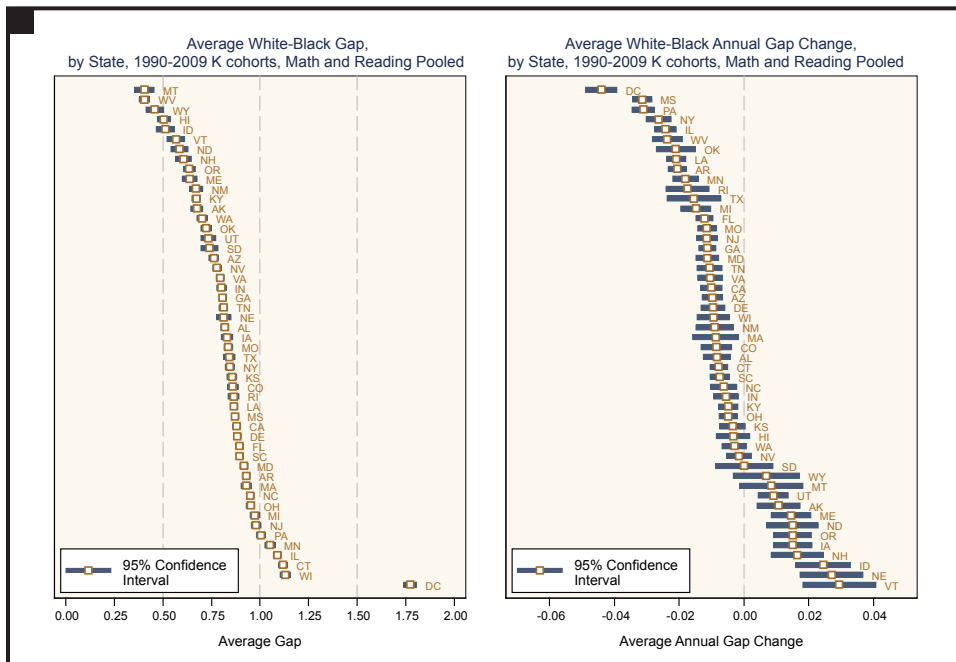
Nonetheless, our progress in narrowing racial achievement gaps has been uneven, and the gaps are still quite large, despite this progress. Most of the reduction in racial achievement gaps occurred for cohorts born between the 1950s and 1970s. Math gaps

FIGURE 1. Trends in Racial and Income Achievement Gaps, by Birth Cohort



Source: Updated versions of figures originally published in Reardon (2011). 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. Racial gaps are based on author's calculations from Long-Term Trend NAEP (NAEP-LTT) data. 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 birth cohort, controlling for age. Age is centered at 13. Each gap is weighted by the inverse of its estimated sampling variance. The income gap trend shown is based on a precision-weighted fitted quartic trend of estimated income achievement gaps from author's calculations from 13 nationally representative studies from 1960-2010.

FIGURE 2. White-Black Achievement Gaps and Trends, by State



Source: Author's calculations from Main NAEP data and state accountability test data collected from state Departments of Education and EdFacts. Estimates shown here are computed by first estimating achievement gaps in each state by year, grade, test subject, and test (NAEP or state accountability test), and then using a precision-weighted random coefficients regression model to estimate the average of these gaps, and their annual trend, in each state, adjusting for grade, subject, and test source. Gap estimates shown are empirical Bayes estimates. 95% confidence intervals are computed using the estimated posterior variance of each state's estimate.

were no smaller for children born in the early 1990s than they were for children born 20 years earlier; reading gaps narrowed only modestly over this same time period. 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 and in state accountability tests.¹ Both white-black and white-Hispanic gaps have narrowed by roughly two-tenths of a standard deviation in the last two decades. While it is unclear whether this trend will continue, it is certainly good news.

Progress in narrowing achievement gaps is also uneven across the country. In some states the white-black achievement gap is more than a standard deviation. In Washington, D.C., the gap is nearly 2 standard deviations; in others it is half that large (see left panel of Figure 2). Moreover, there is considerable variation across states in the trend in achievement gaps. Although the white-black achievement gap has been narrowing on average at a rate of roughly one one-hundredth of a standard deviation per year over the last two decades, in some states it has been narrowing at two to three times that rate, notably, in Washington, D.C., Mississippi, Pennsylvania, New York, and Illinois. In other states, particularly those with small black populations, the white-black achievement gap has actually been widening (see right panel of Figure 2).

As racial achievement gaps have narrowed over the last five decades, the opposite has been true of the achievement gap between children from high- and low-income families. That gap—measured as the difference in

average test scores between children whose families are at the 90th and 10th percentiles of the family income distribution—grew by 40 percent across cohorts born in the early 1970s and late 1990s (see Figure 1). The income achievement gap, which was smaller than the white-black gap for cohorts born in the 1950s and 1960s, is now considerably larger than both the white-black and white-Hispanic gaps.

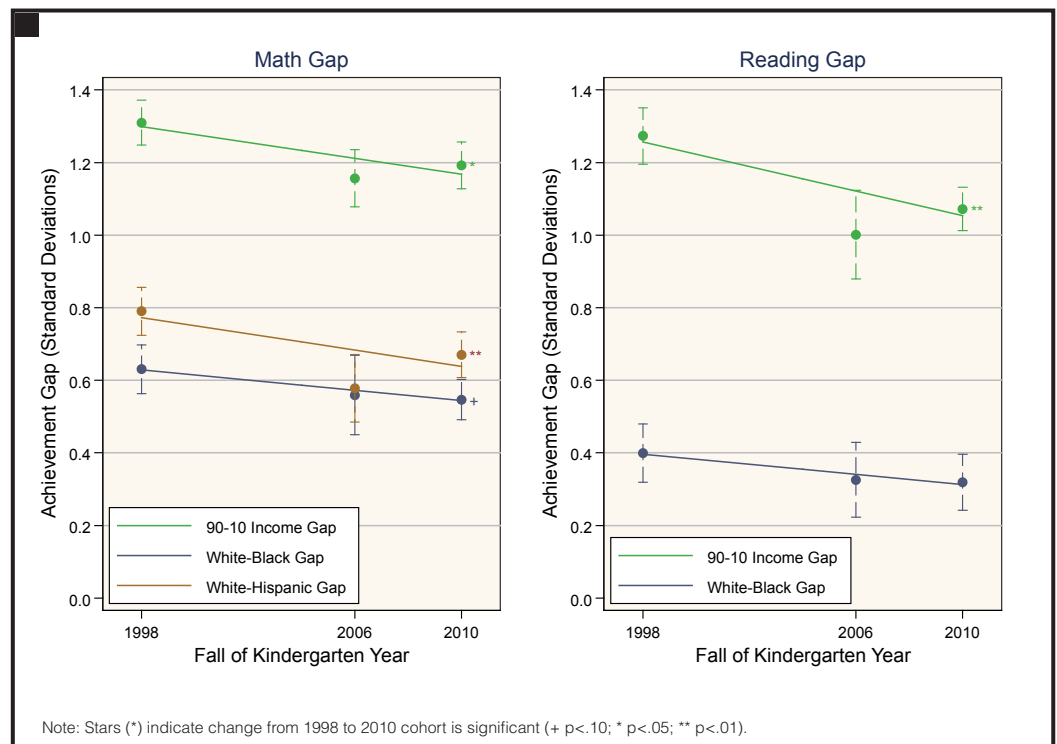
One of the key questions regarding the narrowing of the racial achievement gaps and the widening of the income achievement gap is whether these trends are due to changes in the quality of schools available to children. Likewise, are differences among states in the size and trends in their achievement gaps due to differences in states' educational systems? Or are they due to differences in the out-of-school conditions in which children grow up, such as differences in segregation patterns, income inequality, and racial socioeconomic disparities? The answers to these questions are not yet clear, but there is some research which may shed light on them.

First, the best evidence currently available, from longitudinal studies of children as they progress through school, indicates that achievement gaps change relatively little after elementary school. Income achievement gaps are very large when children enter kindergarten (roughly 1.25 standard deviations) and grow by only 10 percent through 8th grade, for example. The white-black achievement gap does grow somewhat in early elementary school, but is largely stable after that. Second, both racial and economic achievement gaps appear to narrow during the months when children are in school, and then widen again during the summer months. Third, a large proportion of the variance in racial achievement gaps among states can be explained by between-state differences in racial socioeconomic disparities. States where the white-black income and parental education gaps are larger and where segregation is higher have much larger white-black achievement gaps than states where

income disparities, educational disparities, and segregation are smaller. All of these patterns suggest that out-of-school factors play a sizeable role in shaping achievement gaps.

That said, it is not clear whether changes in out-of-school factors are the primary cause of the changes in achievement gaps. The narrowing of the racial achievement gaps coincides with the onset of the accountability movement in education, most clearly institutionalized in the No Child Left Behind (NCLB) Act of 2002, which required states and schools to explicitly attend to racial achievement gaps. Nonetheless, my research has shown that NCLB had little or no impact on racial achievement gaps. Another piece of evidence relevant here is the trend in achievement gaps when children enter kindergarten. Recent evidence comparing racial and income achievement gaps at kindergarten entry between 1998 and 2010 shows that both these gaps have narrowed over the decade (see Figure 3). The racial gaps have narrowed at a rate of about 0.07 to 0.11 standard deviations per decade over this time period, roughly the same rate as the racial gaps in elementary and middle school. This suggests that most of the narrowing of the racial gaps evident in NAEP may be due to pre-kindergarten trends, rather than improvements in educational equity during the K-12 years.

FIGURE 3. Trends in Achievement Gaps at Kindergarten Entry



Source: Reardon and Portilla (2013). Estimates are based on data from the three Early Childhood Longitudinal Studies (ECLS; www.nces.ed.gov/ecls). 90-10 income gap is the estimated difference in test scores between children from families at the 90th and 10th percentiles of the family income distribution. White-Hispanic reading gap trends are not shown because of changes in the reading test format for non-native English speakers.

The recent narrowing of the income gaps, evident in Figures 1 and 3, stands in contrast to the trend over the prior 25 years. While certainly a promising sign, the evidence for this reversal is based largely on the gap measured among kindergarteners in the Fall of 2010. It is too soon to tell whether this heralds the beginning of a sustained improvement in educational equity or simply reflects an anomaly in the data.

Trends and Patterns of Educational Attainment

Another way to gauge our success at improving educational equity is to examine recent trends in high school graduation and college completion rates (see Figures 4 and 5). For a long time in the U.S., high school graduation rates were stagnant, or even declining. Among the cohort scheduled to graduate from high school in the mid-1960s (those born in 1946-1950), roughly 81 percent earned a high school diploma. Among those born 30 years later and scheduled to graduate in the mid-1990s, only 78 percent earned a diploma. Graduation rates have been rising rapidly, however, since the mid-1990s. Indeed, the cohort that was scheduled to graduate in the mid-2000s had an 84 percent completion rate, six percentage points higher than their peers born 10 years earlier.

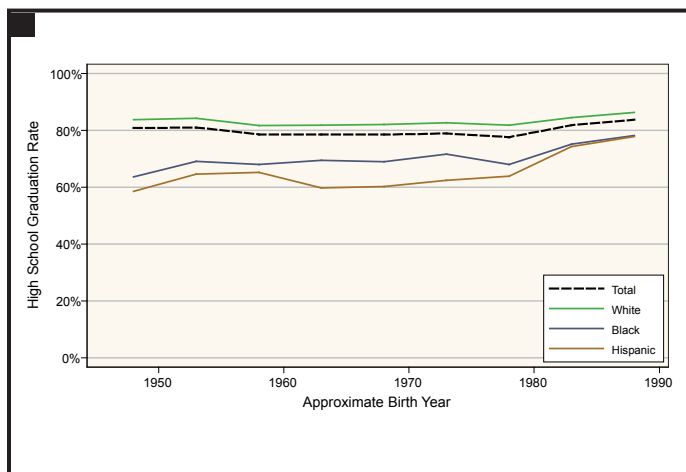
This sharp rise in graduation rates is striking, but perhaps more striking is the fact that it is disproportionately due to rising graduation rates among black and Hispanic students. In fact, the black graduation rate rose 10 percentage points in the last decade, twice as fast as the white rate; the Hispanic rate rose 14 percentage points, three times the white rate.

Despite the improvement in high school completion rates and the narrowing of racial graduation rate differences, there are still large disparities in patterns of educational attainment. Only 15 percent of Hispanic and 23 percent of black young adults (aged 25-29) in 2012 had a bachelor's degree, compared with 40 percent of white young adults (see Figure 5). Moreover, the college completion rate among whites has grown more rapidly than that among blacks and Hispanics over the last four decades. Comparable trend data are not readily available by social class background.

Although black and Hispanic students are increasingly likely to graduate from high school and to enroll in college, they are very disproportionately overrepresented in community colleges and non-selective four-year colleges. This is likely part of the reason why the racial/ethnic gaps in bachelor's degree completion have not narrowed even as high school graduation gaps have narrowed. (Another reason may be that the cohorts for whom high school graduation rates have increased are still too young to be observed in the college completion data.) Figure 6 shows that roughly 35 percent of those enrolling in community college or non-selective four-year colleges are black or Hispanic, while fewer than 5 percent of those enrolling in the most selective colleges are black or Hispanic.

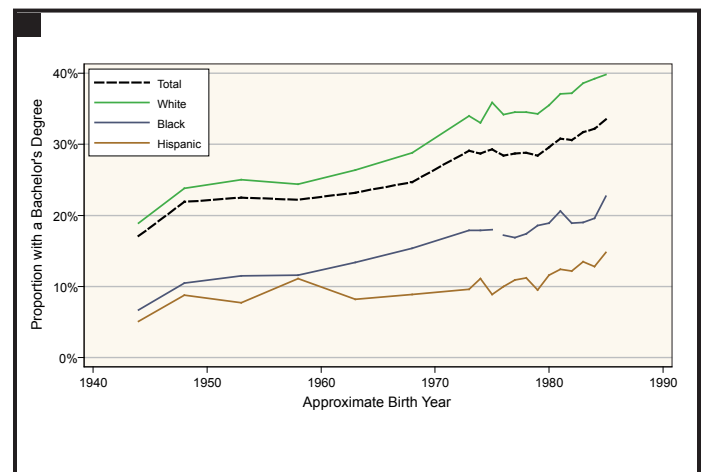
The same pattern is evident by family income as well (see Figure 7). Students from low-income families are dramatically underrepresented in selective four-year colleges. Only 6 percent of students at the most selective colleges and univer-

FIGURE 4. U.S. High School Graduation Rate for 20-24-Year-Olds, by Race/Ethnicity and Birth Cohort



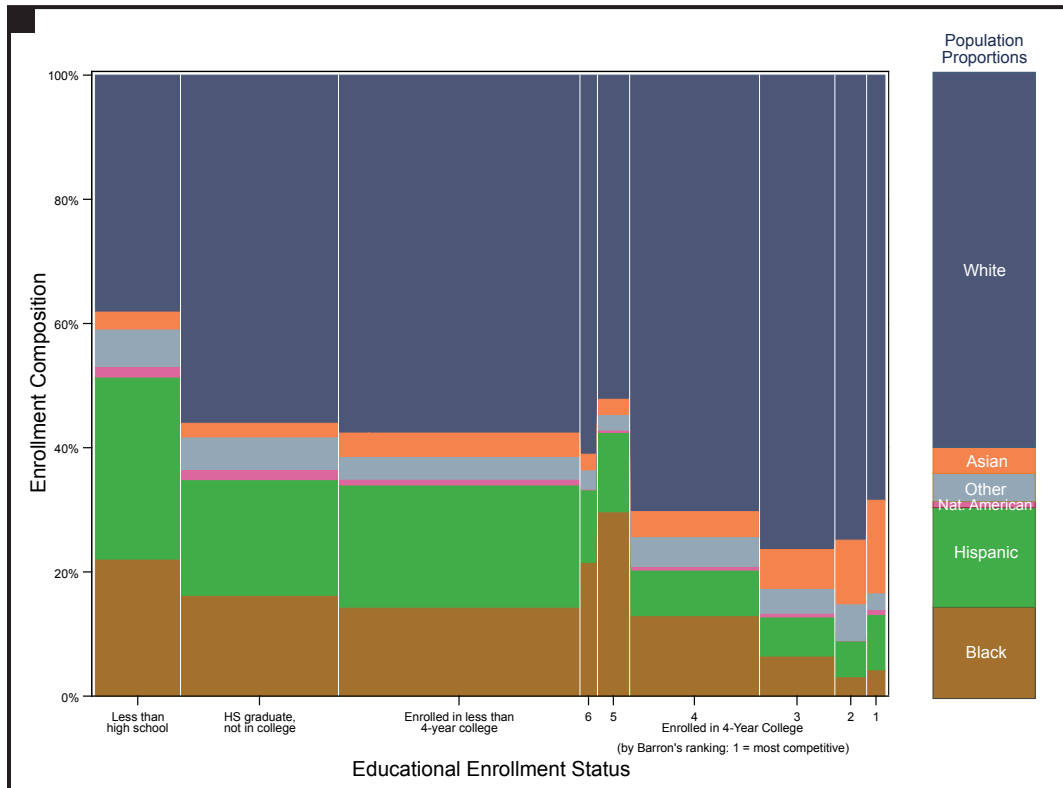
Source: Murnane (2013). The high school graduation rates include only individuals who have received a conventional high school diploma (GED recipients are not counted as high school graduates here).

FIGURE 5. Proportion of U.S. 25-29-Year-Olds With at Least a Bachelor's Degree, by Race/Ethnicity and Birth Cohort



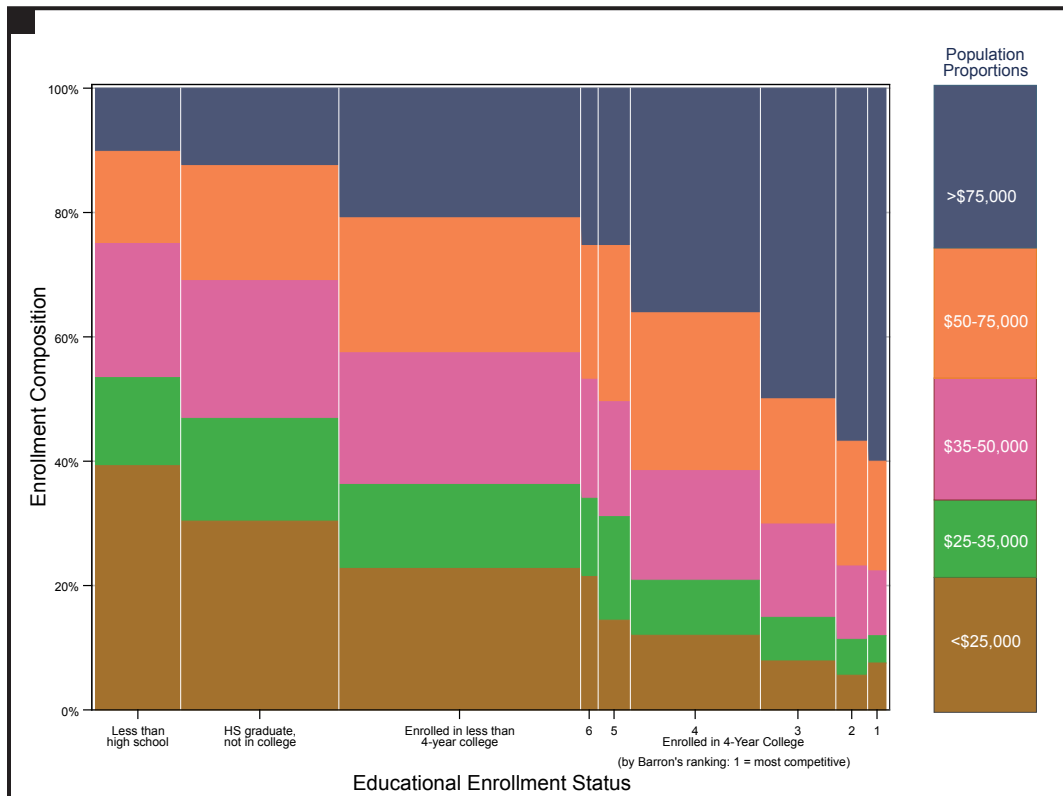
Source: Child Trends (2013). Note that the Office of Management and Budget race definitions were changed beginning with data collected in 2003. Estimates for 25-29-year-old black young adults prior to 2003 (those born roughly prior to 1976) are for the category "non-Hispanic Black"; estimates for later cohorts are for the category "black alone." The latter includes only individuals who identify as black and not any other race. The two category definitions are not strictly comparable.

FIGURE 6. Racial Composition of Postsecondary Destinations, Class of 2004



Source: Reardon, Baker, and Klasik (2012). Data are from the Education Longitudinal Survey (ELS), a study of a nationally-representative sample of students enrolled in 10th grade in Spring 2002. The figure shows the highest postsecondary enrollment status as of Spring 2010. The width of the bars is proportional to the share of the population with each enrollment status. Four-year colleges are categorized by their Barron's selectivity ranking.

FIGURE 7. Income Comparison of Postsecondary Destinations, Class of 2004



Source: Reardon, Baker, and Klasik (2012). Data are from the Education Longitudinal Survey (ELS), a study of a nationally-representative sample of students enrolled in 10th grade in Spring 2002. The figure shows the highest postsecondary enrollment status as of Spring 2010. The width of the bars is proportional to the share of the population with each enrollment status. Family income (2001 annual income, in 2001 dollars) was reported by parents in 2002, when the students were in 10th grade. Four-year colleges are categorized by their Barron's selectivity ranking.

sities come from families in the bottom quintile of the income distribution. Almost 80 percent of students in these colleges come from families in the upper half of the income distribution. Some research indicates that low-income students are even more underrepresented in selective colleges now than they were three decades ago.

The patterns in Figures 4 through 7 are partly the result of the achievement patterns evident in Figure 1. It is likely that part of the reason for the sharp reduction in the white-black and white-Hispanic high school graduation gaps over the last decade is the decline in racial achievement gaps. Black and Hispanic students' math and reading skills at the beginning of high school are markedly higher than they were 20 years ago, which means they are entering high school much better prepared to succeed academically.

Conversely, the fact that achievement gaps remain large—despite some recent progress—is certainly part of the reason for the disparities in bachelor's degree attainment and enrollment at selective colleges evident in Figures 5 through 7. This conclusion is suggested by the importance of standardized test scores in admission to such colleges. Nonetheless, there are many other factors that shape college enrollment patterns, including affirmative action policies (or their absence) and trends in the cost and availability of financial aid. Recent research suggests that many high-achieving low-income students do not apply to highly selective colleges, despite having test scores that would make them eligible, perhaps because of perceptions of the cost of such colleges, lack of information about financial aid, or concerns that they would not fit in.

Conclusion

The primary impression one gets from reviewing the evidence here is that inequality of educational outcomes, by race and by social class background, remains very high in the United States. That is not to say that we have not made some progress since the 1950s and 1960s. Indeed, racial disparities in academic achievement and high school graduation are smaller and, in the case of achievement gaps, substantially smaller, than they were 40 years ago. And in most states, these racial disparities continue to narrow, albeit slowly in most places. We have been less successful, however, at reducing disparities in the highest levels of academic attainment: black and Hispanic students obtain bachelor's degrees at rates far below those of whites, and are dramatically underrepresented in the most selective four-year colleges and universities.

Progress in narrowing socioeconomic disparities in educational outcomes, however, has been even more elusive than racial progress. In fact, socioeconomic gaps in academic achievement have widened substantially in the recent decades. The one bright spot of evidence here, however, is the indication in very recent data that socioeconomic gaps in kindergarten readiness have narrowed in the last decade, perhaps presaging an era of progress and reduced inequality. But such progress, and continued progress in narrowing racial disparities, will not occur without focused policy attention on improving both our schools and the wide economic disparities that inhibit the educational success of the nation's children. ■

NOTES

1. See, for example, Hemphill, Vanneman, and Rahman, 2011; Vanneman, Hamilton, Baldwin Anderson, and Rahman, 2009; and Reardon, Valentino, Kalogrides, Shores, and Greenberg, 2013.

ADDITIONAL RESOURCES

Child Trends. 2013. "Educational Attainment." www.childtrends.org/?indicators=educational-attainment

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

Murnane, Richard J. 2013. "U.S. High School Graduation Rates: Patterns and Explanations." *Journal of Economic Literature*, 51(2), 370-422.

Reardon, Sean F. 2011. "The widening academic achievement gap between the rich and the poor: New evidence and possible explanations." In R. Murnane & G. Duncan (Eds.), *Whither Opportunity? Rising Inequality and the Uncertain Life Chances of Low-Income Children*, New York: Russell Sage Foundation Press.

Reardon, Sean F., Rachel Baker, and Daniel Klasik. 2012. "Race, Income, and Enrollment Patterns in Highly Selective Colleges, 1982-2004." Stanford, CA: Center for Education Policy Analysis, Stanford University.

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.

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." Washington, D.C.: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education.