On average, black students typically score one standard deviation below white students on standardized tests—roughly the difference in performance between the average 4th grader and the average 8th grader. Historically, what has come to be known as the black-white test-score gap has emerged before children enter kindergarten and has tended to widen over time.

What are the causes of this persistent gap in achievement? In study after study, scholars have investigated the effects of differences among white and black students in their socioeconomic status, family structure, and neighborhood characteristics and in the quality of their schools. To be sure, socioeconomic status and the trappings of poverty are important factors in explaining racial differences in educational achievement. Yet a substantial gap remains even after these crucial influences are accounted for.

Gaining a better understanding of what causes the test-score gap is of great importance because eliminating the gap could yield great advances in the well-being of African-Americans. In separate studies, Derek Neal and William Johnson in 1996 and June O’Neill in 1990 found that most of the wage gap between black and white adults disappears once the data are adjusted to reflect their scores on the Armed Forces Qualifying Test; in other words, those adults with similar scores earned similar wages. Thus closing the test-score gaps that emerge in high school may be a critical prerequisite to reducing wage inequality between the races. As scholars...
Christopher Jencks and Meredith Phillips write, “Reducing the black-white test score gap would do more to promote racial equality than any other strategy that commands broad political support.”

To take a fresh look at the gap and its sources, we examined a new data set, the Early Childhood Longitudinal Study Kindergarten Cohort, compiled by the U.S. Department of Education. The results are quite surprising after adjusting the data for the effects of only a few observable characteristics, the black-white test-score gap in math and reading for students entering kindergarten essentially disappeared. Put simply, white and black children with similar personal and family background characteristics achieved similar test scores (see Figure 1).

However, our results show that the achievement gap, while negligible among black and non-Hispanic white children with similar characteristics when they enter kindergarten, expands as they grow older. From the beginning of kindergarten to the end of first grade, black students lose 20 percent of a standard deviation (approximately 10 percent of a standard deviation each year) relative to white students with similar characteristics. If the gap were to continue to grow at this rate, by 5th grade the average black student would be half a standard deviation behind his white counterpart—a residual gap similar in magnitude to that found in previous analyses. Hispanic children do not experience this widening test-score gap relative to otherwise similar white students; indeed, they systematically close the gap, perhaps because their initial scores are artificially low due to the relative inexperience with the English language among some immigrants and their children (see Figure 2).

Here we present our findings and explore possible reasons why they diverge from those of previous studies. We also consider various explanations for the expanding gap between black and white students as they move through school.

The Growing Gap (Figure 1)
Black kindergartners and white kindergartners with similar socioeconomic backgrounds now achieve at similar levels. However, the raw gap in test scores remains large and both the raw and adjusted gaps grow as students move through school.

Hispanic Children Close the Gap (Figure 2)
There remains a substantial gap between the test scores of Hispanic children and white children, but it shrinks as Hispanic students move through school.

The raw black-white achievement gaps, while sizable, are substantially smaller than those observed in earlier data sets for children of the same age.

The Survey
The Early Childhood Longitudinal Study includes a nationally representative survey of more than 20,000 children who entered kindergarten in 1998. The full sample was interviewed in the fall and spring of kindergarten and in the spring of 1st grade. Moreover, a random sample of a quarter of the respondents was also interviewed in the fall of 1st grade. The full sample included an average of more than 20 children per school in each of the roughly 1,000 schools participating in the study, making it possible to conduct within-school analyses.

Students took standardized tests in the fall of kindergarten and in the spring of 1st grade. They were initially given oral tests, since most of them did not know how to read. Overall, non-Hispanic white students scored 0.27 standard deviations above the average on the math exam in the fall of kindergarten, while black students fell 0.36 standard deviations below the average, yielding a raw black-white gap of 0.63 standard deviations. By the spring of 1st grade, the raw gap in mathematics increased to 0.73 standard deviations. The initial black-white gap in reading was smaller (0.4 standard deviations). As in math,
After two years in school, Hispanic students were performing better relative to whites than were their black counterparts.

Blacks—0.72 standard deviations in math and 0.43 standard deviations in reading. However, these gaps narrowed somewhat by the end of 1st grade, reaching 0.56 and 0.31 standard deviations, respectively. After two years in school, then, Hispanic students were performing better relative to whites than were their black counterparts.

Most of the available data on students’ background characteristics were collected only once or changed little over time for individual students. The most important of these characteristics is a composite measure of socioeconomic status developed by the survey’s researchers. The components of the socioeconomic status measure are parents’ level of education, parents’ occupational status, and household income. On the whole, black children were being reared in circumstances less likely to be conducive to academic achievement than those experienced by white children; in general they have lower socioeconomic status and fewer children’s books in the home, to name just two disadvantages. Hispanics were also worse off than whites on average.

Results

Adjusting the test-score data for this factor reduces the gap even more. On average, black students in the sample had 39 children’s books in their home, compared with an average of 93 books among white students. Taking this difference into account cuts the black-white test-score gap to less than a fourth of a standard deviation in math and completely eliminates the gap in reading. The gap between white and Hispanic students also shrinks.

More important for this analysis, adding these variables to the equation further accounts for the differences between the test scores of whites and those of blacks and Hispanics. In fact, the estimates suggest that black children with characteristics similar to their white peers score slightly better than whites in reading and at the same level in math.

To this point the analysis has assumed that children of different races will respond similarly to changes in their socioeconomic status, home environments, and so on. However, black children tend to live in situations that are less conducive to learning. If they do not derive as much benefit as white children from improvements in their home environments, our results may overstate the degree to which the gap is attributable to these factors.

To address this potential source of bias, we examined the effects of our key control variables for students of each race separately. The effects of most factors on black, white, and Hispanic students were statistically indistinguishable. However, it turns out that the black children in our sample were less responsive to changes in socioeconomic status than the white children: a one-standard-deviation improvement in socioeconomic status for a black child was associated with a 0.18 standard deviation increase in math scores, compared with 0.32 among white children.

To fully account for the difference in test scores. Adjusting the data for a range of other factors, such as neighborhood characteristics, family size, whether the mother works, whether English is spoken at home, and participation in preschool, does not appreciably change the results. This is not to say that such variables as neighborhood characteristics have no effect, only that the effect of such variables is already captured by the handful of social background characteristics, such as WIC participation, that we incorporated into our analysis.
Why So Different? Nevertheless, the fact that the black-white test-score gap essentially disappears when sufficient controls are included is striking. In past research, a substantial gap has always persisted. The 1998 study by Meredith Phillips and her colleagues, mentioned earlier, had the greatest success in explaining racial differences in achievement, yet the unexplained portion of the achievement gap on the vocabulary test used in their study was still so large that it nearly exceeded the raw gap in reading and mathematics we found in the Early Childhood Longitudinal Survey data.

Why do our results differ so sharply from those of previous research? There are three leading explanations: 1) the sample of children included in the data set used by Phillips, the Children of the National Longitudinal Survey of Youth (CNLSY), especially in the early years, may be nonrepresentative; 2) better information on students’ background characteristics is available in the Early Childhood survey; and 3) black students born into recent cohorts have made real gains relative to blacks born a decade earlier.

Although plausible, the first two explanations appear to play only a small role empirically. However, real gains by blacks in recent cohorts do appear to be an important part of the divergence between our results and past research. By limiting the CNLSY data to cohorts born in the same years as the children in our data, we found raw test-score gaps only half as large as those found in the earlier cohorts of data used by Phillips and remarkably close to those found in our data set.

Real gains among black children in recent years could explain this result. However, even after adjusting the data to account for similar factors, we were still not able to eliminate the achievement gaps among the children in our data set. This finding is in line with the results obtained by Phillips. After introducing the same set of controls we used in the analysis above, the estimated black-white achievement gaps in recent cohorts of the CNLSY were about 0.5 standard deviations in math and 0.4 in vocabulary. Thus, although the raw gaps are similar in the two data sets, larger residual gaps remain in the CNLSY for reasons we can’t explain.

The Growing Gap

Our results suggest that black children and white children with similar characteristics now start school at similar levels of achievement. But what happens as they age? In raw test scores, black students lose some ground relative to whites, one might expect that this would remain constant. In fact, however, the residual gap increases more than the raw gap. In other words, the data suggest that the relative importance of factors outside of school decreases over time, presumably because schools become such a central part of a child’s life.

Do black children suffer worse “summer set-backs” when school is not in session? Once students enter school, however, the gap between black and white students continues to widen even after the data are adjusted to reflect differences in all of the school characteristics for which data are available. Indeed, the available measures of schools’ characteristics as a group explain only a small fraction of the variation in student outcomes. Furthermore, both Hispanic and Asian children also experience worse schools than whites, but neither of those groups is losing ground. All in all, the issue is murky—perhaps because the measures of school quality in the data are inadequate.

Connections in schools attended by blacks versus those attended by whites. More important, the gap between blacks and whites continues to widen even after the data are adjusted to reflect differences in all of the school characteristics for which data are available. Indeed, the available measures of schools’ characteristics as a group explain only a small fraction of the variation in student outcomes. Furthermore, both Hispanic and Asian children also experience worse schools than whites, but neither of those groups is losing ground. All in all, the issue is murky—perhaps because the measures of school quality in the data are inadequate.

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Conclusion

Several scholars have argued that black students lose more ground over the summer than white students because they attend schools that are worse than those attended by whites. But if that were true, one would expect to observe a widening of the raw gaps between blacks and whites; to the extent that our control variables adequately captured the characteristics of schools attended by blacks versus those attended by whites, one might expect that this would remain constant. In fact, however, the residual gap increases more than the raw gap. In other words, the data suggest that the relative importance of factors outside of school decreases over time, presumably because schools become such a central part of a child’s life.

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Are black students losing ground because they attend worse schools? If on average blacks attend schools that are worse than those attended by whites, one might expect that this would be reflected in the schools’ characteristics. Relative to otherwise similar white schools, black schools do attend schools with more students eligible for the federal lunch program and schools in which subjective reports from officials indicated higher levels of gang activity, littering in front of the school, and litter around the school.

Several scholars have argued that black students lose more ground over the summer than white students because of their relatively worse home and neighborhood environments. Our data provide a unique opportunity to test this hypothesis because a subset of the sample was tested both in the spring of kindergarten and early in the fall of 1st grade.

On the raw scores, there is little difference before and after the summer break; to the extent there is any gap, it favors black students. With controls, black students lose ground slightly to whites over the summer in math, but the result is not statistically significant. Black students make slight gains in reading. Thus there is little evidence that differential learning over the summer can help to explain the growing achievement gap.

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Can biased expectations among teachers explain why black students lose ground? If, as some have argued, white teachers have lower expectations for black children, one would predict that black students with white teachers would lose more ground than black students with black teachers. We found that black children who have at least one black teacher start out performing somewhat worse than their white peers in math and slightly better in reading, relative to black students who have no black teacher.

By the end of 1st grade, however, the black-white test-score gap is greater for students who have at least one black teacher. This is exactly the opposite of what one would predict from a discrimination story.