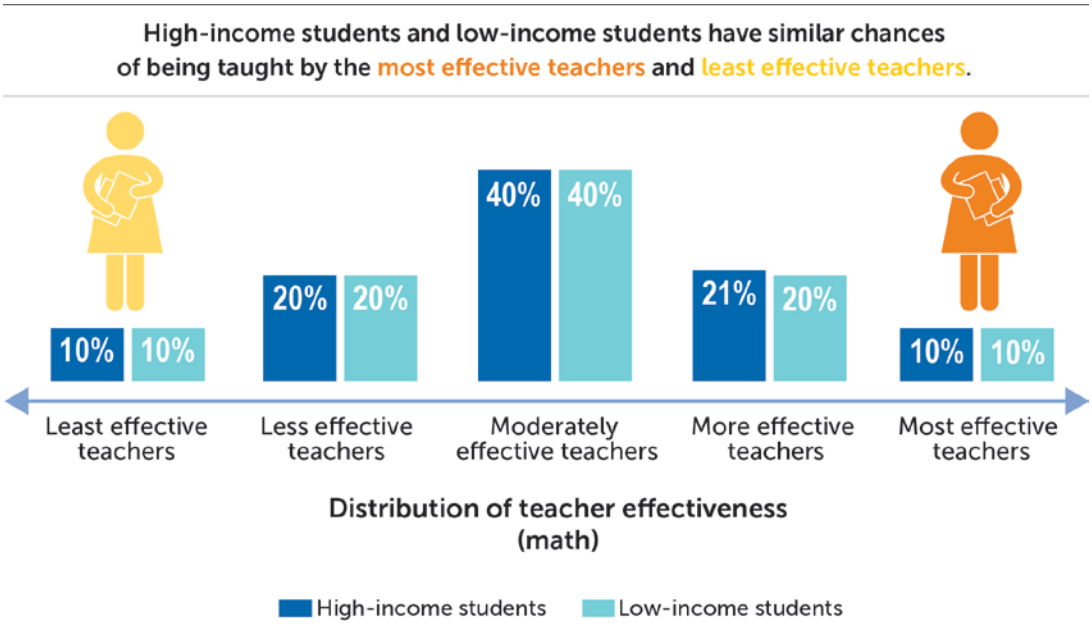
Are High- and Low-Income Students Taught by Equally Effective Teachers?



Note: The "least effective" teachers are those below the 10th percentile in the distribution of teacher effectiveness. Teachers between the 10th and 30th percentiles are "less effective," those between the 30th and 70th percentiles are "moderately effective," those between the 70th and 90th percentiles are "more effective," and those above the 90th percentile are "most effective."

Based on a study of 26 geographically diverse school districts over five years, high- and low-income students have similar chances of being taught by the teachers who are most effective and least effective at improving student achievement. In English/language arts and math, low-income students are just as likely as high-income students to be taught by the most effective teachers in a district (top 10 percent), and similarly likely to be taught by the least effective teachers in a district (bottom 10 percent). On average, there are small differences in the effectiveness of teachers of high- and low-income students in both subjects (one percentile point on average).

In a small subset of districts (3), however, inequities in teacher effectiveness for high- and low-income students are large enough to meaningfully contribute to the existing student achievement gap in math.

Patterns of teacher hiring into high- and low-poverty schools and teacher transfers between schools within a district are consistent with small inequities in teacher effectiveness for high- and low-income students. Patterns of teacher attrition do not contribute to inequitable access to effective teachers.

Background

Inequality in educational outcomes is substantial and persistent in the United States.[i] Recent policy initiatives to address these gaps have emphasized teachers' contributions to student achievement.[ii] A key question for policymakers is whether inequality in educational outcomes is caused by differences in students' access to effective teachers.

The Study

We examine whether low-income students are taught by less effective teachers than high-income students, and if so, whether reducing this inequity would close the student achievement gap. We also describe how the hiring of teachers and their subsequent movement into and out of schools could affect low-income students' access to effective teachers. The study includes fourth- to eighth-grade teachers over five school years (2008-2009 to 2012-2013) in 26 school districts across the country.

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To measure teacher effectiveness, we used a value-added model, a statistical approach to measure a teacher's contribution to student learning, based on students' performance on achievement tests.

Study approach

To determine whether low-income students have equal access to effective teachers, we compared the average effectiveness of teachers of high- and low-income students. We also looked at whether high-income students were more or less likely than low-income students to be taught by the most and least effective teachers. We examined access to effective teachers in English/language arts (ELA) and math. We defined students who are eligible for a free or reduced-price school lunch as low-income; students not eligible for free or reduced-price lunch were defined as high-income.

The value added model used to measure teacher effectiveness examined students' test scores at the end of a school year after accounting for students' scores in the previous year and other characteristics, as well as the characteristics of other students in the classroom. The value added scores are converted into teacher percentiles, which rank teachers from least effective (1st percentile) to most effective (99th percentile), with the average teacher at the 50th percentile.

To better understand the factors that could influence low-income students' access to effective teachers, the study team measured the number and effectiveness of teachers (1) hired into high- and low-poverty schools, (2) transferring between high- and low-poverty schools, and (3) leaving the district from each type of school. We define teachers who are newly hired into a district—including novice and experienced teachers—as **new hires**, those who move between schools within a district as **transfers**, and those who leave a district as **leavers**. Leavers may move to another district or leave teaching altogether.

For this analysis, low-poverty schools are those with less than 60 percent of students eligible for a free or reduced-price lunch, medium-poverty schools have 60 to 90 percent of students who are eligible, and high-poverty schools have more than 90 percent of students who are eligible.

Participating districts

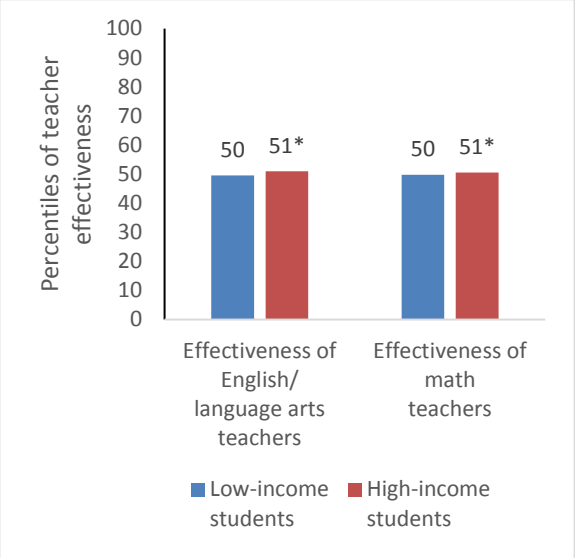
The 26 study districts are geographically diverse and similar to the 100 largest U.S. districts. Median district enrollment is approximately 70,000 students, 63 percent of the students are eligible for free or reduced-price lunch, 29 percent are black, and 42 percent are Hispanic. Among 8th grade students, the typical low-income student in the study districts performs 26 to 27 percentile points lower on state achievement tests than the typical high-income student. In addition, there is substantial variation in teacher effectiveness in study districts.

Findings highlights

- **There are small differences in the effectiveness of teachers of high- and low-income students in the average study district.** In both subjects, differences in the effectiveness of teachers of high- and low-income students are one percentile point, on average. The average teacher of a low-income student is just below the 50th percentile, while the average teacher of a high-income student is at the 51st percentile (Figure 1). As a result, we estimate that providing low-income students with at least equally effective teachers each year for a period of five years would reduce the student achievement gap between high- and low-income students by an average of less than 1 percentile point in English/ language arts, and by two percentile points in math.

- **High- and low-income students have similar chances of being taught by the most effective teachers and the least effective teachers.** In both subjects, the top 10 percent of teachers in a district are just as likely to teach low-income students as they are to teach high-income students (math results are shown in title figure). The bottom 10 percent of teachers are similarly likely to teach each group of students—9 percent of high-income students have one of these teachers compared to 10 percent of low-income students for ELA. In math, among both groups of students, 10 percent have one of the least effective teachers.

Figure 1. Average teacher effectiveness for low- and high-income students



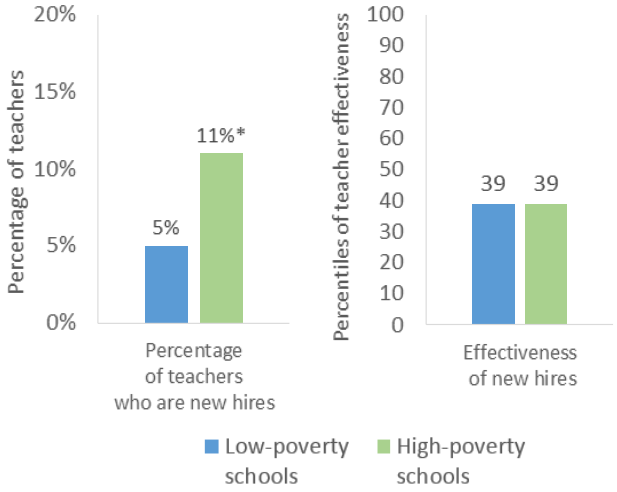
Source: Authors' calculations based on district administrative data.

Note: Results are based on 26 districts for years 1 to 5, including grades 4 to 8 for 12 districts and grades 6 to 8 for 14 districts.
* Differences in average teacher effectiveness for low- and high-income students are statistically significant at the 0.05 level, two-tailed test.

- **Teacher hiring patterns are consistent with small differences in the effectiveness of teachers of high- and low-income students.** The teachers hired into high-poverty schools are equally effective as those hired into low-poverty schools (Figure 2). These new hires—defined as novice or experienced teachers who are new to a district—are less effective than the average teacher, with effectiveness at the 39th percentile on average. High-poverty schools have more new hires than low-poverty schools, but this difference is likely to have only a small influence on equity because (1) relatively few teachers are new hires (11 percent of teachers in high-poverty schools and 5 percent in low-poverty schools), and (2) new hire performance improves quickly. On average, new hires become as effective as the average teacher after one year.

- **Teacher transfer patterns are also consistent with small differences in the effectiveness of teachers of high- and low-income students.** On average, teachers who transfer to schools in a lower poverty category within a district—such as from high- to medium- or low-poverty schools—are at the 48th percentile of effectiveness (Figure 3). Teachers who transfer to schools in a higher poverty category are less effective, at the 43rd percentile. This flow of teachers works to the disadvantage of students at high-poverty schools. However, just under 4 percent of all teachers transfer to a school in a higher or lower poverty category (a little less than 2 percent from higher- to lower-poverty school and less than 2 percent from lower- to higher-poverty school). A little more than 4 percent of all teachers move between schools with similar poverty rates.

Figure 2. Percentage and effectiveness of new hires for low- and high-poverty schools

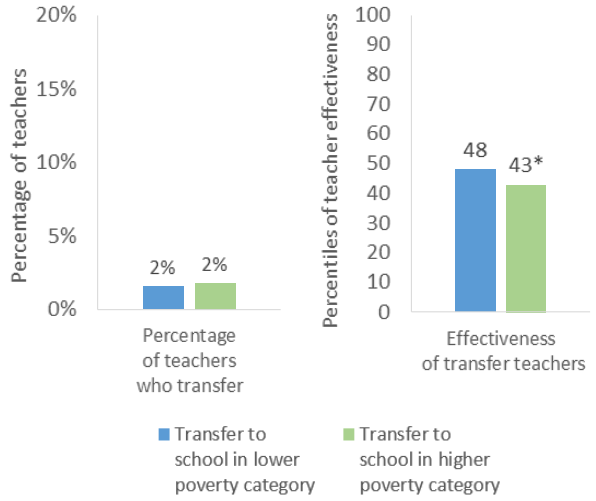


Source: Authors' calculations based on district administrative data.

Note: The results are for teachers in grades 4 to 8 in 12 districts and in grades 6 to 8 in 13 districts, for years 2 through 5.
* Differences between low- and high-poverty schools are statistically significant at the 0.05 level, two-tailed test.

- **Teacher attrition patterns do not contribute to differences in the effectiveness of teachers of high- and low-income students.** The teachers who leave a district from both high- and low-poverty schools—defined here as leavers are less effective than the average district teacher (Figure 4). The average leaver from high-poverty schools is at the 43rd percentile and the average leaver from low-poverty schools is at the 46th percentile, but this difference is not statiatically significant. More of these teachers leave high-poverty schools than low-poverty schools (10 versus 7 percent). This attrition is unlikely to lead to greater inequity in access to effective teachers because the effectiveness of teachers leaving high- and low-poverty schools do not differ statistically.

Figure 3. Percentage and effectiveness of teachers transferring to schools in lower and higher poverty categories

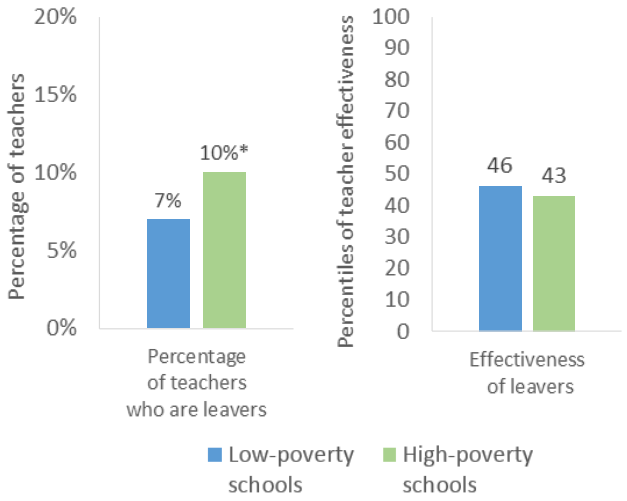


Source: Authors' calculations based on district administrative data.

Note: The results are for teachers in grades 4 to 8 in 12 districts and in grades 6 to 8 in 13 districts, for years 1 through 4.

* Differences between teachers who transfer to schools in a lower poverty category and a higher poverty category are statistically significant at the 0.05 level, two-tailed test.

Figure 4. Percentage and effectiveness of leavers for low- and high-poverty schools



Source: Authors' calculations based on district administrative data.

Note: The results are for teachers in grades 4 to 8 in 12 districts and in grades 6 to 8 in 13 districts, for years 1 through 4.

* Differences between low- and high-poverty schools are statistically significant at the 0.05 level, two-tailed test.

- In a small subset of study districts, there is meaningful inequity in access to effective teachers in math. In 3 of 26 study districts in math, we estimate that providing high- and low-income students with equally effective teachers from grade four to eight would reduce the student achievement gap by at least a tenth of a standard deviation of student achievement, the equivalent of about 4 percentile points over a five-year period.[iii]

[i] Reardon, Sean. "The widening academic achievement gap between rich and poor: New evidence and possible explanations." In *Whither Opportunity? Rising inequality, schools, and children's life chances*, edited by Greg Duncan and Richard Murnane. New York, NY: Russell Sage Foundation, 2011, pp. 91–115.

[ii] For example, U.S. Department of Education. "New Initiative to Provide All Students Access to Great Educators: U.S. Department of Education Launches 'Excellent Educators for All Initiative.'" Washington, DC: U.S. Department of Education, July 2014.

[iii] We define districts as having meaningful inequity if providing equal access to effective teachers over a five-year period would reduce the student achievement gap by about 4 percentile points. Although we did not have a specific guideline or precedent for setting this threshold for meaningful inequity, we chose a somewhat conservative standard that corresponds to the minimum effect size that studies of education interventions are often designed to measure.

IES develops these study snapshots to offer short, accessible summaries of complex technical evaluation reports. For the full report with technical details, see http://ies.ed.gov/ncee/pubs/20174007/.

Isenberg, Eric, Jeffrey Max, Philip Gleason, Matthew Johnson, Jonah Deutsch, and Michael Hansen (2016). Do Low-Income Students Have Equal Access to Effective Teachers? (NCEE 2017-4007). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education.