RESEARCH REPORT

Does Pupil Transportation Close the School Quality Gap?

Evidence from New York City

Sarah A. Cordes
TEMPLE UNIVERSITY

Amy Ellen Schwartz
SYRACUSE UNIVERSITY

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Errata

This report was updated on February 11, 2019, to correct the placement of the former figure 8, now appendix figure A.2, and to correct its title. Accordingly, the former figures 9 through 12 are now figures 8 through 11, and the former appendix figures A.2 through A.4 are now appendix figures A.3 through A.5. Also, the content from page 11 onward has reflowed, and the table of contents has been updated to reflect that change.

Does Pupil Transportation Close the School Quality Gap?

The persistent "heat" characterizing the public debate about school choice is fueled, in part, by the dearth of empirical evidence about the conditions under which choice improves access to good schools for disadvantaged students and reduces educational inequality. There is, perhaps, more agreement about the "theory" of choice: allowing students to attend district public schools outside their historic residential zone will enable students in disadvantaged neighborhoods with low-quality schools to enroll in higher-quality schools in other neighborhoods, reducing disparities in school quality between poor and nonpoor and black and white students and, ultimately, improving their educational outcomes. Whether or how much this outcome is realized depends on three factors. First, there must be higher-quality options available elsewhere in the district. Second, students must be able to get to these better schools, either on foot or using transportation. Third, the benefit from attending these higher-quality schools must outweigh the costs incurred by students for travel, including financial costs and nonfinancial costs (e.g., time and stress). Thus, a key ingredient for the success of policies that expand access to high-quality schools is *pupil transportation*—the availability and quality of school bus services and the quality of and subsidies for public transit.

There is, however, virtually no empirical research examining pupil transportation, its relation to school choice, or how much students use pupil transportation to attend better schools. In this report, we begin to close that gap, bringing to bear new data on pupil transportation and school quality to shed light on how much students use pupil transportation to attend a choice school rather than their zoned school and whether they use pupil transportation to reach better schools. We use newly available, unique, and detailed individual-level data on pupil transportation—identifying students who use the school bus and those who get MetroCards for free subway or bus rides—provided by the New York City Department of Education (NYCDOE) for students enrolled in New York City public schools. We link these to student-level data on demographics (including race or ethnicity, gender, and poverty status), educational needs (e.g., limited English proficiency or special education), address, and both the closest school and the school attended. We combine this with information on school-level proficiency on state-mandated English language arts (ELA) and math exams to compare the quality of schools students actually attend with that of their zoned school.

Our findings provide evidence suggesting pupil transportation plays an important role in allowing students to attend a choice school, rather than their zoned school, and to attend a better school.

Students who attend a *choice school* (i.e., a traditional public school other than their zoned school) are more likely to use pupil transportation and to attend higher-quality schools. Further, among students attending choice schools, those who use transportation attend significantly better schools than students attending nearby choice schools, with bus riders seeing the largest gains. This disparity is particularly pronounced for black and Hispanic bus riders, who attend significantly better schools than their same-race peers who attend their zoned school and are significantly more likely to attend better schools than their same-race peers who attend choice schools but do not use transportation.

New York City Context

New York City is an ideal setting to study the role of pupil transportation in school choice. First, transportation is important to New York City schoolchildren. Its department of education oversees the country's largest pupil transportation operation, with 9,500 buses serving more than 100,000 students in 1,500 schools and with 475,000 students receiving subsidized MetroCards. At the elementary level, roughly 30 percent of K–5 students live far enough from school to be eligible for either the school bus or full-fare MetroCards, which allow three free trips on New York City subways and buses each school day. Second, policies governing eligibility for the school bus and subsidized public transportation are set citywide, but the availability of bus service is at the discretion of school principals, and many decline to offer buses to general education students for such reasons as limited space outside the school to drop off students and limited administrative capacity to oversee bus service. This variation in policy allows us to gain insight into how much the availability of bus services in high-quality schools influences the enrollment of students from other neighborhoods. Third, New York City allows a considerable amount of school choice, even among elementary schools. In some areas, open enrollment is formal policy.[1] In other areas, informal policies and practices provide waivers allowing students to attend a school outside their catchment area. The city also offers an extensive system of gifted programs, magnet schools, and dual-language programs that do not rely on catchment areas.[2] More than 40 percent of K–5 students attend a school other than their zoned school. Finally, persistent racial and socioeconomic segregation of New York City schools and neighborhoods make it a compelling setting to study the role of pupil transportation in facilitating poor and minority students' ability to attend higher-quality schools outside their neighborhoods.

The Office of Pupil Transportation provides two forms of pupil transportation: the school bus and MetroCards. *School buses* pick up and drop off students at designated stops in the morning and afternoon.[3] *Full-fare MetroCards* allow students to use subways and city buses without charge.[4]

Student eligibility for transportation is based on the distance between a student's residence and the school he or she attends, which vary with student age. Students in K–2 must live more than one-half mile from school and students in grades 3–6 must live more than a mile from school to be eligible for a school bus or full-fare MetroCards.

All eligible students are offered transportation assistance. Some are offered school bus service, if it is available and feasible, but not all schools offer bus service and not all students who want to take the bus can be accommodated on a route. Students not offered the bus or who would prefer public transportation assistance are offered full-fare MetroCards. In 2015, more than 40 percent of elementary and middle schools did not offer bus service, meaning nearly 20 percent of bus-eligible students attended a school without bus service.[5] At the same time, not all eligible students are offered buses even *within* schools that do offer school buses because of limitations on routing, timing, and availability. Bus routes require a minimum ridership of 11 students and travel a maximum distance of five miles, so eligible students who live too far away from the school or from other classmates may not be offered bus service. This can have important implications for the role of the school bus in choice, as students who travel long distances from home to attend a high-quality school may not be offered bus service.[6]

Data and Sample

We focus on elementary school students (grades K–5) in academic year 2014–15 for two reasons. First, the New York City Department of Education provides yellow-bus service only to students up through grade 6, after which all eligible students are offered MetroCards. Second, distance to school may be a more limiting factor for younger children. We exclude charter school students because data on their transportation are unavailable. Thus, we use the term "choice school" to indicate one chosen among traditional district public schools, rather than in the broader sense of charter schools and vouchers to attend private schools.

We construct several measures important to our analysis. First, we identify each student's zoned elementary school and then define a student as attending a choice school if he or she attends a district school other than that zoned school.[7] Second, we construct two measures of school quality: the school's average proficiency rate in ELA and math, which is on a scale of 0 to 100, and the school's average median growth percentile in ELA and math, which compares the growth of the median student at each school with his or her academic peers (i.e., those who received the same score on the prior year's test). This metric was produced as part of the 2014–15 school quality reports and is also on a scale of 0 to

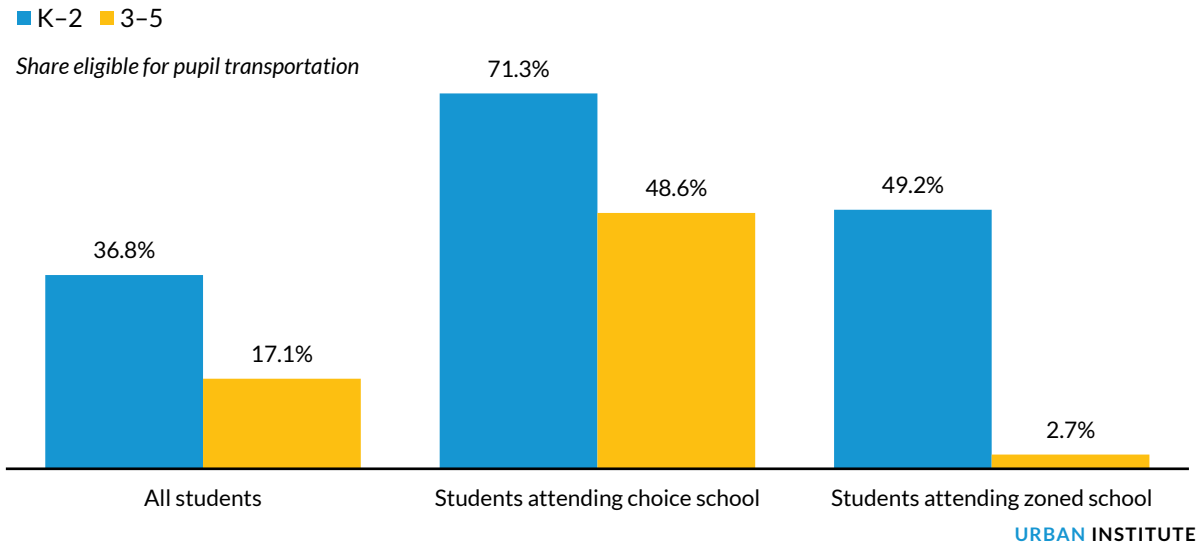
100.[8] Third, we construct a measure of relative school quality that captures whether students attend a choice school significantly better than their own zoned school. To capture a large and potentially meaningful difference in quality, we define "significantly better" as a school with proficiency rates (median growth percentiles) at least 10 (5) percentage points higher than a student's zoned school (about a 2 decile increase in school quality). Finally, we identify students' mode of transportation based on data from the Office of Pupil Transportation, which indicates whether a student is assigned to a bus route or receives a full-fare MetroCard.

Who Is Eligible for Transportation?

Approximately one-third of students in K–2 and 17 percent of students in grades 3–5 live far enough from school to be eligible for pupil transportation (figure 1). There are large differences in eligibility between students who attend choice schools and those who attend their zoned school. Almost three-quarters of students in K–2 who attend a choice school are eligible for pupil transportation compared with 49.2 percent of those who attend their zoned school. And though almost half of students in grades 3–5 who attend a choice school are eligible for pupil transportation, only 2.7 percent of students in grades 3–5 who attend their zoned school are eligible. Thus, students in choice schools not only travel farther to school, but a significant share travel far enough for the New York City Department of Education to offer them transportation assistance.

FIGURE 1

Eligibility for Pupil Transportation, Choice School versus Zoned School, by Grade, 2015



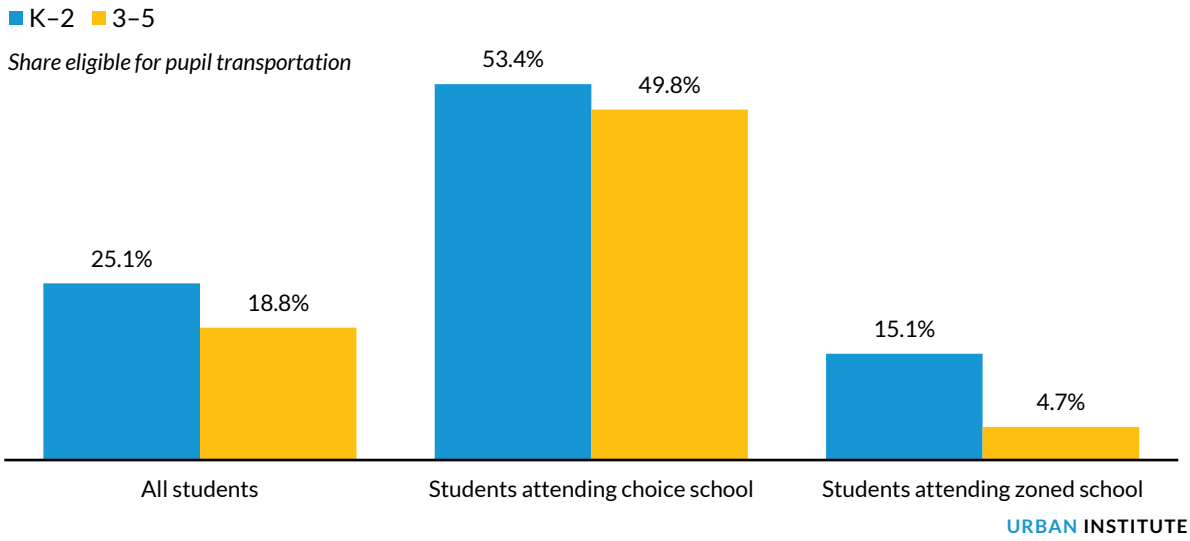
Source: Authors' calculations.
Notes: Sample includes K–5 students with transportation, demographic, and attendance data. Sample excludes students in charter schools or in full-time special education schools.

Are Students at Choice Schools More Likely to Use Transportation?

These farther distances translate into large differences in transportation use between students attending choice schools and those attending zoned schools (figure 2). Though 53.4 percent of K–2 choice school students use transportation, only 15.1 percent of K–2 students enrolled in their zoned school do so, a 38.3 percent gap. Among students in grades 3–5, 49.8 percent in choice schools use transportation, more than 10 times the 4.7 percent of students who attend their zoned school.

FIGURE 2

Pupil Transportation Use, Choice School versus Zoned School, by Grade, 2015



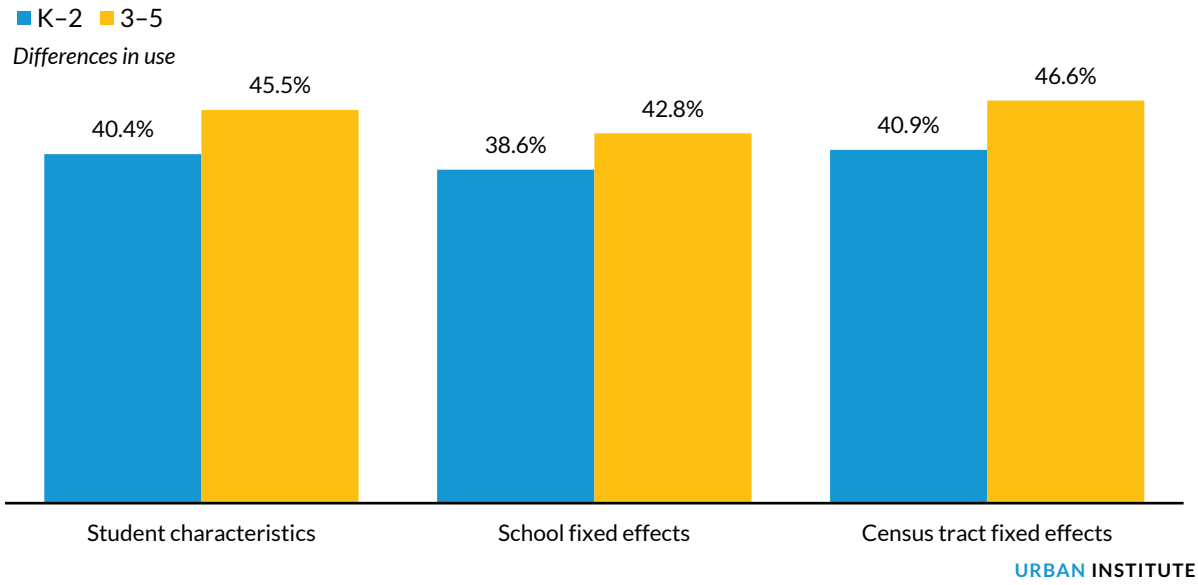
Source: Authors' calculations.

Notes: Sample includes K–5 students with transportation, demographic, and attendance data. Sample excludes students in charter schools or in full-time special education schools.

These differences may be driven by a variety of factors, including differences in the types of students attending choice schools, differences in the schools (including bus availability), and differences in geography (e.g., population density or proximity to school options). Do differences in bus use reflect underlying differences in students attending choice schools and the neighborhoods they live in, or are choice schools different? We shed light on this using regression analyses linking the use of transportation to our choice indicator variable and variables capturing characteristics of students, schools, and neighborhoods successively (figure 3).

FIGURE 3

Difference in Pupil Transportation Use between Students Attending Choice Schools and Students Attending Zoned Schools, 2015



Source: Authors' calculations.

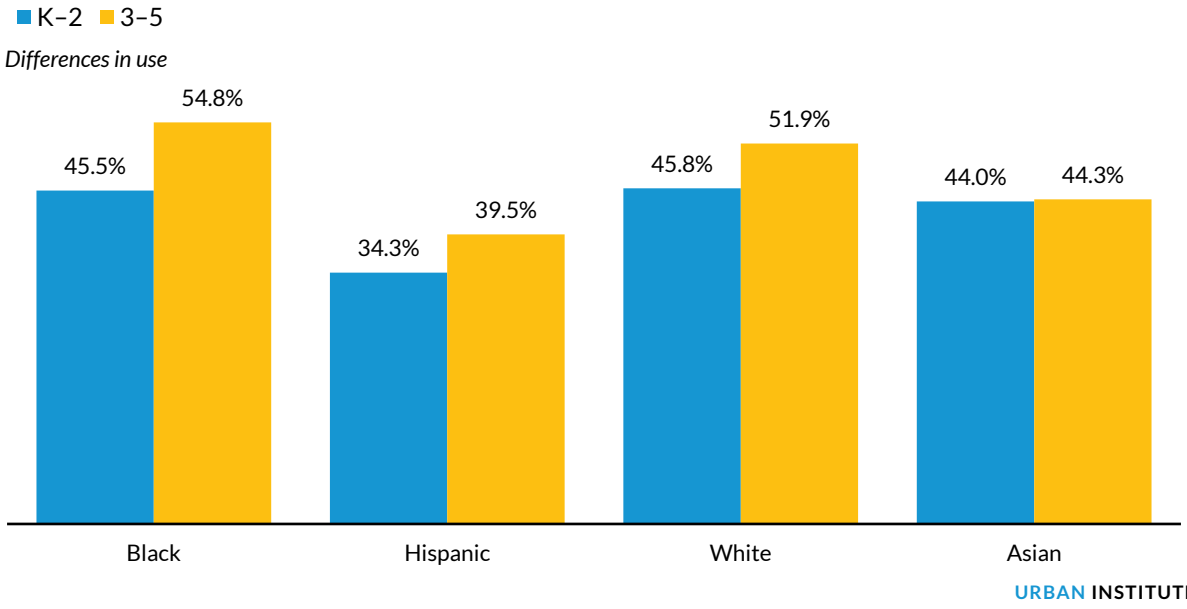
Notes: All results are statistically significant at the 1 percent level. Student characteristics include race or ethnicity, gender, limited English proficiency, and poverty. Models with student characteristics and fixed effects also include controls for borough of residence, and models with school fixed effects and census tract fixed effects include controls for student characteristics. Sample includes K–5 students with transportation, demographic, and attendance data. Sample excludes students in charter schools or in full-time special education schools.

Controlling for student demographics and borough of residence does little to account for the disparity in transportation use between choice school students and zoned school students and even increases the gap slightly. Students in K–2 attending choice schools are 40.4 percentage points more likely and students in grades 3–5 are 45.5 percentage points more likely to use the bus or MetroCards than demographically similar students attending zoned schools. Once we account for differences in schools, including differences in offering yellow bus service, the disparity shrinks. When comparing students attending the same school, choice school students in K–2 are 38.6 percentage points more likely and choice school students in grades 3–5 are 42.8 percentage points more likely to use transportation than similar students for whom that school is their zoned school.[9] But when we compare students living in the same neighborhood, disparities in transportation use are somewhat larger, choice school students in K–2 are 40.9 percentage points more likely and choice school students in grades 3–5 are 46.6 percentage points more likely to use pupil transportation than similar students who attend their zoned school.

Key findings emerge when we investigate these relationships separately for four racial or ethnic groups: Asians, blacks, Hispanics, and whites (figure 4). Disparities in use among black and white students who live in the same neighborhood are similar to one another—differences in use between choice school students and their same-race peers is 46 to 55 percentage points. Although the disparity in use among Asian students in K–2 is similar to that of black and white students, the disparity is much smaller for older Asian students (44.3 percentage points). Most striking, however, is that at 34.3 to 39.5 percentage points, the disparity in use among Hispanic students attending choice schools is lower than what we observe for other groups. Thus, Hispanic students who attend choice schools may not travel as far to do so, which may reflect differences in the availability of better options, for example, or have consequences for their success at choosing better schools.

FIGURE 4

Difference in Pupil Transportation Use between Students Attending Choice Schools and Students Attending Zoned Schools, by Race or Ethnicity, Census Tract Fixed Effects, 2015



Source: Authors' calculations.

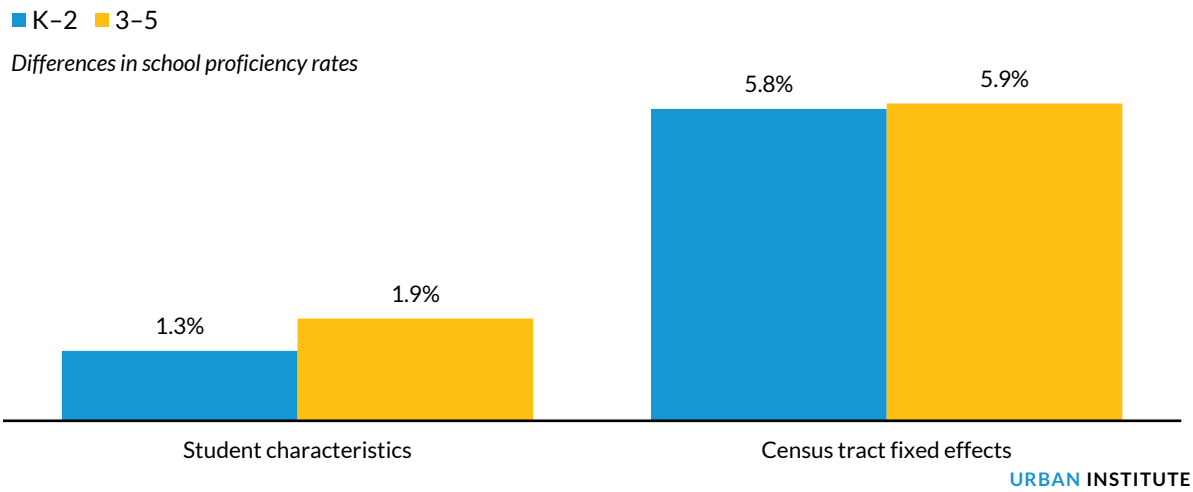
Notes: All results are statistically significant at the 1 percent level. All models include controls for gender, limited English proficiency, poverty, and census tract fixed effects. Sample includes K–5 students with transportation, demographic, and attendance data. Sample excludes students in charter schools or in full-time special education schools.

Do Students Who Attend Choice Schools Attend Better Schools?

Students who attend choice schools are more likely to use transportation, but the extent to which transportation allows students to attend better schools depends on whether these choice schools are, in fact, higher quality. A first-order question is whether students who choose attend better schools. Figure 5 shows that this appears to be the case. Students enrolled in choice schools attend schools with proficiency rates 1.3 to 1.9 percentage points higher in ELA and mathematics than students enrolled in their zoned school. This difference is larger among students living in the same neighborhood, where students in choice schools attend schools with proficiency rates 5.8 to 5.9 percent higher than similar students in the same neighborhood who attend their zoned school, which is roughly a 1 decile improvement in school quality. When we measure school quality using growth, rather than proficiency, we observe slightly different results (figure 6). Controlling only for student characteristics, students in K–2 attending choice schools attend schools with growth that is 1.1 percentage points lower, and students in grades 3–5 attend choice schools with similar growth than students who attend their zoned school. However, when we limit comparisons to students living in the same neighborhood, we see that students in K–2 who attend choice schools attend schools with growth that is 0.8 percentage points higher, and students in grades 3–5 who attend choice schools attend schools with growth that is 1.2 percentage points higher. This indicates that students who attend choice schools tend to come from neighborhoods with lower-quality schools (as measured by growth). These are important results, suggesting that students are not only using choice to attend schools farther from home, but higher-quality schools than they might attend if they stayed in the neighborhood.

FIGURE 5

Differences in School Proficiency Rates between Students Attending Choice Schools and Students Attending Zoned Schools, 2015

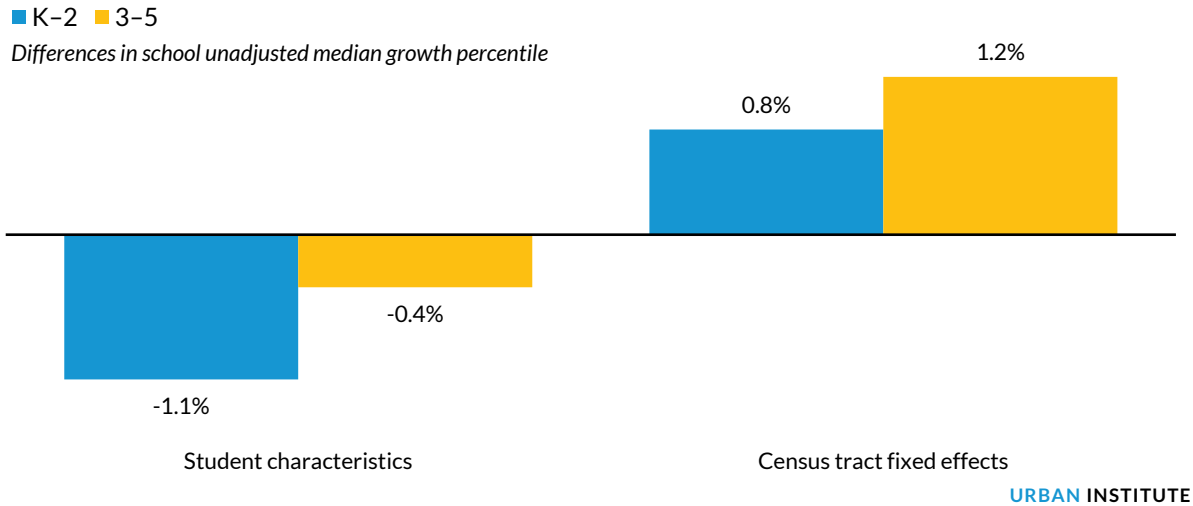


Source: Authors' calculations.

Notes: All results are statistically significant at the 1 percent level, except for K–2 students in models with only student characteristics. Student characteristics include race or ethnicity, gender, limited English proficiency, and poverty. Models with census tract fixed effects also include controls for student characteristics. Sample includes K–5 students with transportation, demographic, and attendance data. Sample excludes students in charter schools or in full-time special education schools.

FIGURE 6

Differences in Unadjusted Median Growth Percentiles between Students Attending Choice Schools and Students Attending Zoned Schools, 2015



Source: Authors' calculations.

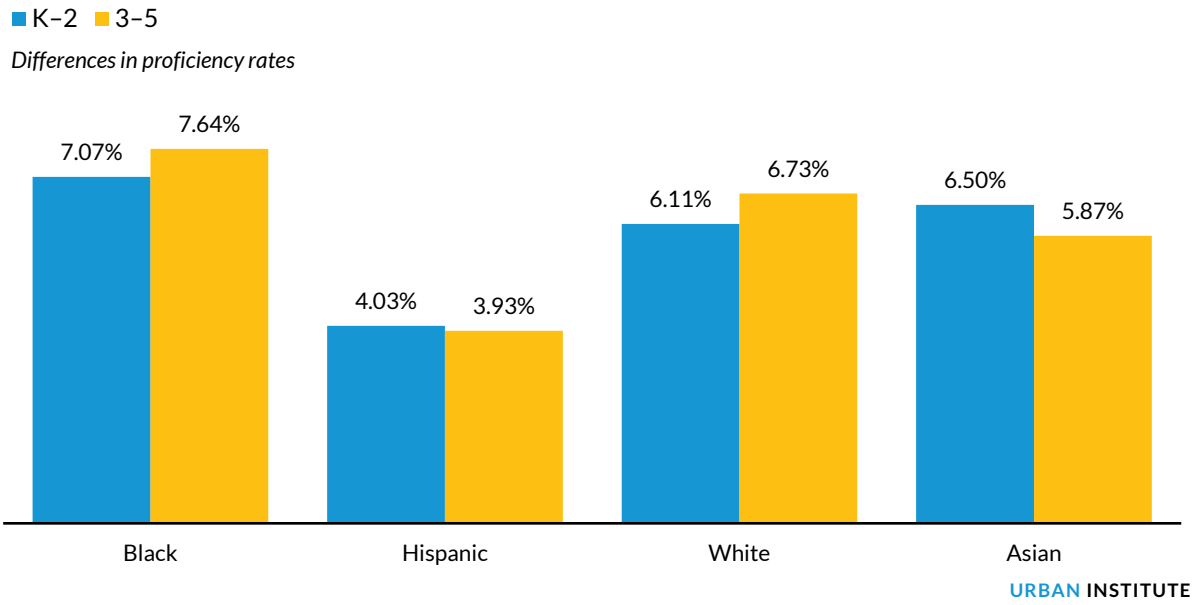
Notes: All results are statistically significant at the 1 percent level except for students in grades 3–5 in models with only student characteristics. Student characteristics include race or ethnicity, gender, limited English proficiency, and poverty. Models with census tract fixed effects also include controls for student characteristics. Sample includes K–5 students with transportation, demographic, and attendance data. Sample excludes students in charter schools or in full-time special education schools.

To ease interpretation going forward, we focus on results where school quality is measured using average proficiency, and we present results using growth in the appendix. Results are generally consistent, but we focus on school proficiency because this measure is more readily available and understandable to parents making schooling decisions.

Stratifying by race or ethnicity shows that choice school students of all racial or ethnic groups attend better schools than their peers who live in the same neighborhood, but the difference in quality is smallest for Hispanic students and largest for black students (figure 7). Hispanic students attend choice schools with proficiency rates 3.93 to 4.03 percentage points higher than neighborhood peers who attend their zoned school, but black students attend schools with proficiency rates 7.07 to 7.64 percentage points higher than other black students from the same neighborhood attending their zoned school. White and Asian students fall in the middle, attending choice schools with proficiency rates 5.87 to 6.73 percentage points higher than their neighborhood peers.

FIGURE 7

Differences in School Proficiency Rates between Students Attending Choice Schools and Students Attending Zoned Schools, by Race or Ethnicity, Census Tract Effects, 2015



Source: Authors' calculations.

Notes: All results are statistically significant at the 1 percent level. All models include controls for gender, limited English proficiency, poverty, and census tract fixed effects. Sample includes K–5 students with transportation, demographic, and attendance data. Sample excludes students in charter schools or in full-time special education schools.

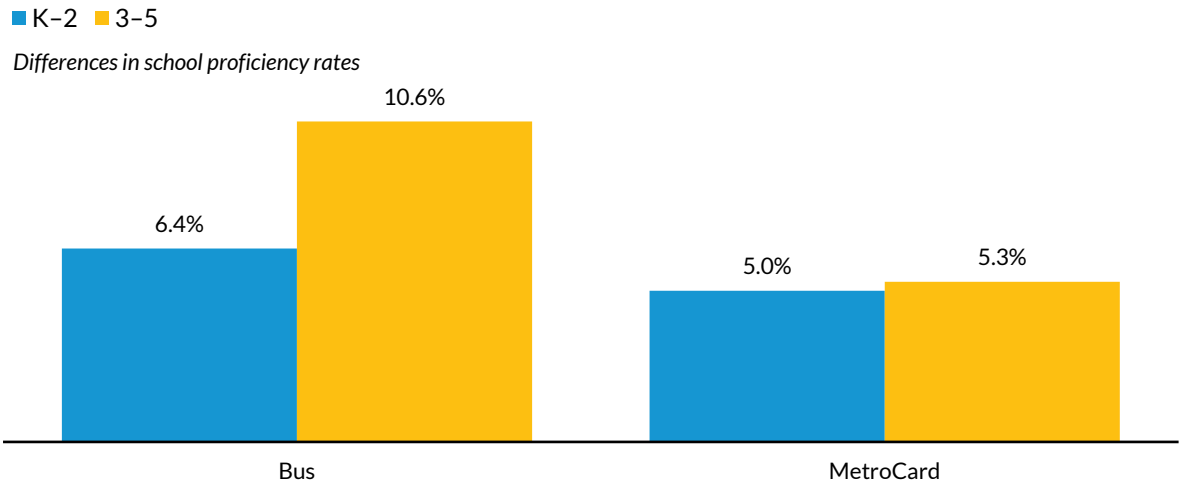
What Is the Role of Transportation?

Our results so far show that students attending choice schools are more likely to use transportation and to attend better schools than students who attend their zoned school. The next step in understanding the role of transportation in facilitating access to better schools is to link these analyses to answer this question: Does transportation-assisted choice translate into better schools? We focus on students who attend a choice school and compare the quality of schools attended by students who use transportation with schools attended by students with no transportation.[10]

Figure 8 shows that students who use transportation to attend choice schools, particularly older students who use the school bus, attend significantly higher-quality schools than students who attend choice schools and do not use transportation. Students who attend a choice school using the school bus attend schools with proficiency rates that are 6.4 percentage points higher for students in K–2 and 10.6 percentage points higher for students in grades 3–5 than students from the same neighborhood who do not use transportation, and those using MetroCards attend schools with proficiency rates that are 5.0 percentage points higher for students in K–2 and 5.3 percentage points higher for students in grades 3–5.

FIGURE 8

Differences in School Proficiency Rates between Students with and without Transportation, Students Attending Choice Schools Only, Census Tract Effects, 2015

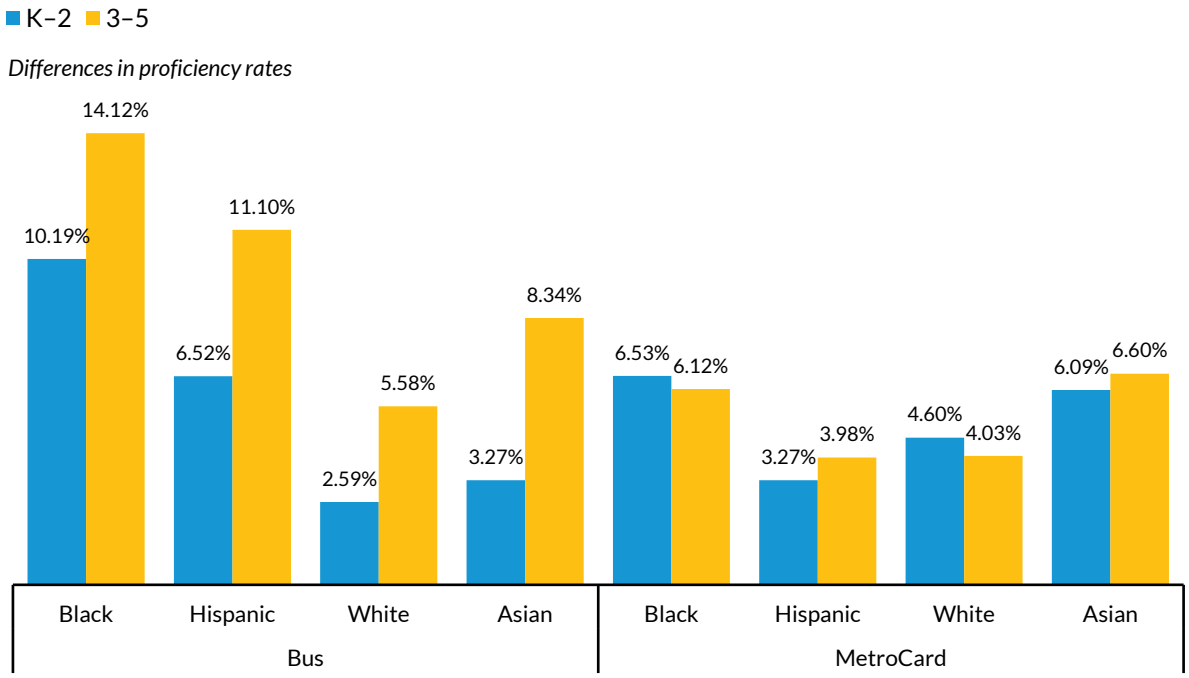


Source: Authors' calculations.
Notes: All results are statistically significant at the 1 percent level. All models include controls for race or ethnicity, gender, limited English proficiency, poverty, and census tract fixed effects. Sample includes K–5 students with transportation, demographic, and attendance data who attend a choice school. Sample excludes students who attend their zoned school, students in charter schools, and students in full-time special education schools.

Just as the importance of the school bus varies for students in different grades, it varies across students of different races or ethnicities. The school bus is particularly important for older black and Hispanic choice school students. Black and Hispanic bus riders in grades 3–5 attend schools with proficiency rates 14.12 and 11.40 percentage points higher, respectively, than their neighborhood peers who attend choice schools but do not have transportation (figure 9). This is roughly 1.5 to 2 times the gain in school quality experienced by younger black and Hispanic bus riders and 2 to 3 times the gain experienced by students who use MetroCards. Though the school bus plays an important role for white and Asian students as well, the differences in school quality between those who ride the bus or use MetroCards and those with no transportation are more modest, on the order of 3 to 8 percentage points.

FIGURE 9

Differences in School Proficiency Rates between Students with and without Transportation, by Race or Ethnicity, Students Attending Choice Schools Only, 2015



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Source: Authors' calculations.

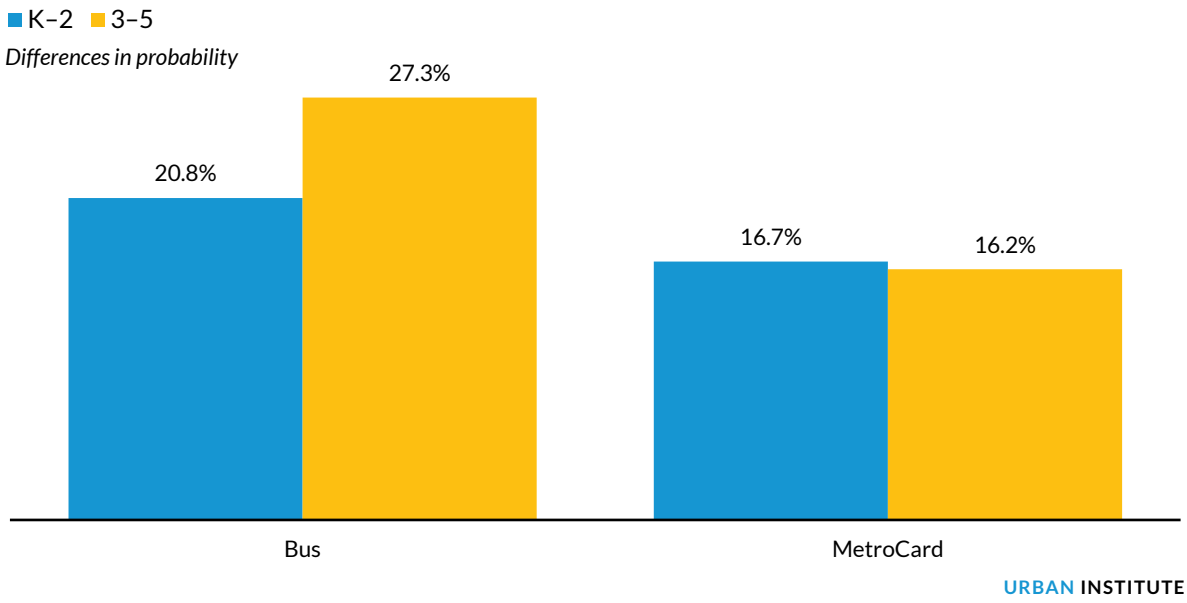
Notes: All results are statistically significant at the 1 percent level, except white bus riders in K–2. All models include controls for gender, limited English proficiency, poverty, and census tract fixed effects. Sample includes K–5 students with transportation, demographic, and attendance data who attend a choice school. Sample excludes students who attend their zoned school, students in charter schools, and students in full-time special education schools.

Finally, we examine whether students who use transportation are more likely to attend choice schools that are significantly better than their own zoned school. As with all prior analyses, we account for differences in neighborhoods using census tract fixed effects.

In all models, students who use transportation to attend a choice school are more likely to attend a significantly better school than students with no transportation. This difference is largest for bus riders in grades 3–5 (figure 10). More specifically, though students in K–2 who use any transportation and students in grades 3–5 who use MetroCards are 16 to 20 percentage points more likely to attend a better school, students in grades 3–5 who use the bus are 27 percentage points more likely to attend a better school. These differences are quite substantial and indicate that transportation, and in particular the school bus, is key in providing students with better schooling opportunities.

FIGURE 10

Differences in Probability of Attending a Better School between Students with and without Transportation, Students Attending Choice Schools Only, Census Tract Effects, 2015



Source: Authors' calculations.

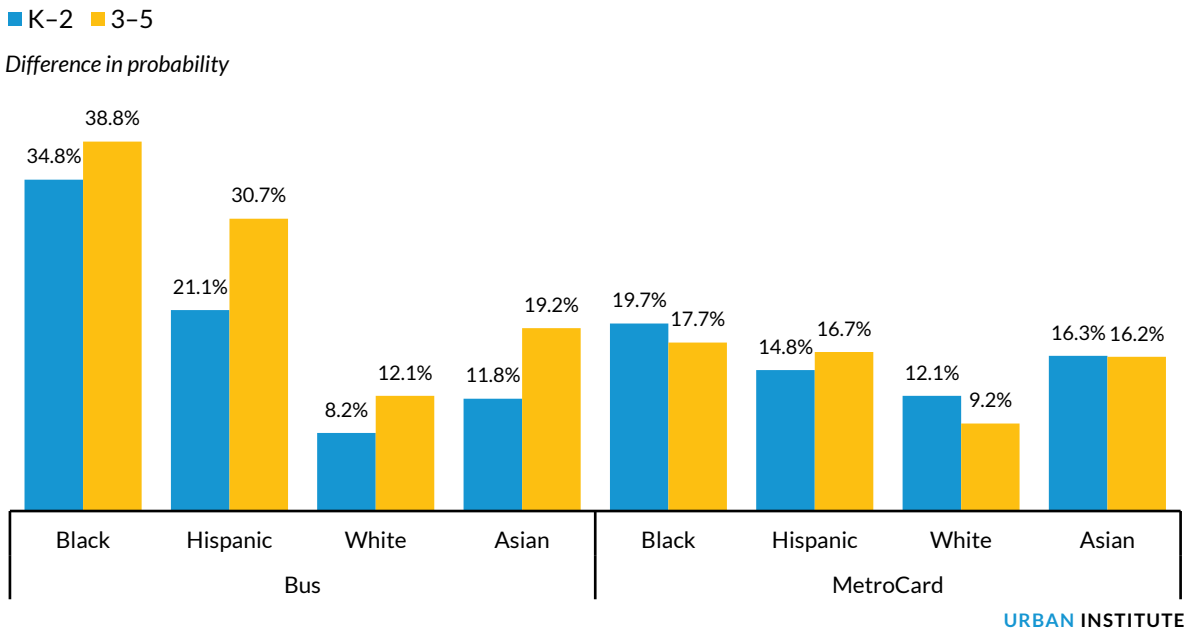
Notes: All results are statistically significant at the 1 percent level. A school is considered better if average proficiency is at least 10 percentage points higher than a student's zoned school. All models include controls for race or ethnicity, gender, limited English proficiency, and poverty. Sample includes K–5 students with transportation, demographic, and attendance data who attend a choice school. Sample excludes students who attend their zoned school, students in charter schools, and students in full-time special education schools.

This is especially true for older black and Hispanic students, among whom bus riders are 38.8 and 30.7 percentage points more likely to attend better schools than their same-race peers who attend

"neighborhood" choice schools, respectively (figure 11). The bus also plays an important but more modest role for white and Asian students.

FIGURE 11

Differences in Probability of Attending a Better School between Students with and without Transportation, by Race or Ethnicity, Students Attending Choice Schools Only, Census Tract Effects, 2015



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Source: Authors' calculations.

Notes: All results are statistically significant at the 1 percent level. A school is considered better if average proficiency is at least 10 percentage points higher than a student's zoned school. All models include controls for gender, limited English proficiency, poverty, and census tract fixed effects. Sample includes K–5 students with transportation, demographic, and attendance data who attend a choice school. Sample excludes students who attend their zoned school, students in charter schools, and students in full-time special education schools.

Implications for Research and Policy

Three key conditions must be met for choice to reduce disparities in educational outcomes: there must be higher-quality options available within the district, students must be able to get to these better schools, and the benefits of attending these schools must outweigh the costs incurred by additional travel. The results in this report speak to the first two of these conditions. Our findings show that students who attend choice schools attend better schools and are significantly more likely to do so using either the school bus or free MetroCards. Furthermore, students who attend a "neighborhood" choice

school close to home are significantly less likely to attend a better school than students who go to choice schools far from home using transportation.

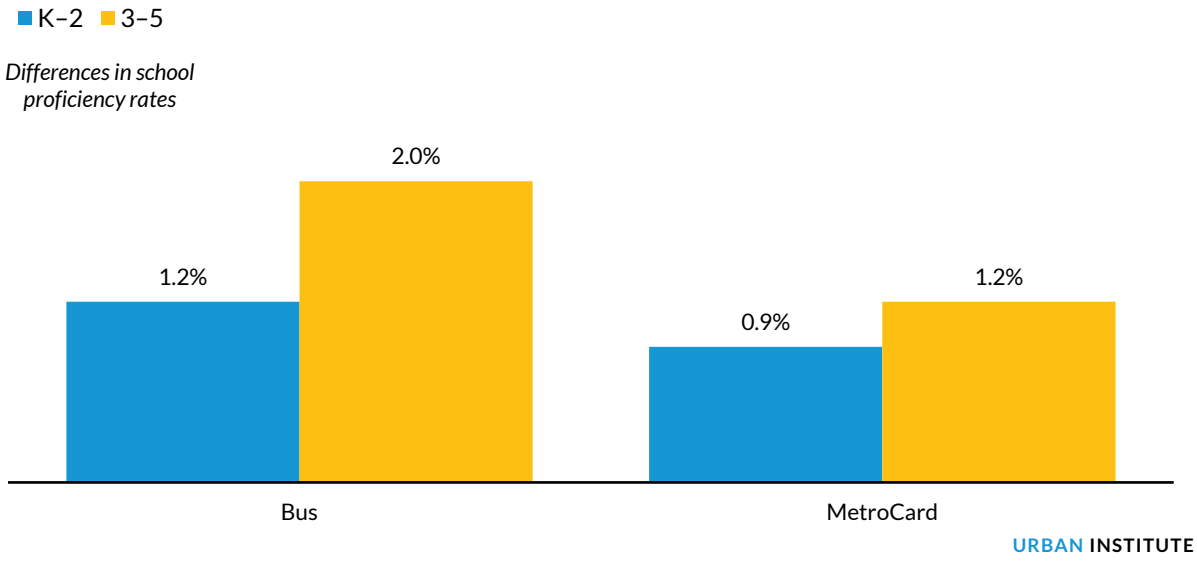
There are notable differences in these relationships by race or ethnicity. In particular, Hispanic students appear less likely than other groups to attend a choice school outside their neighborhood. One implication is that it may be beneficial to provide additional assistance to Hispanic students and their families who wish to attend choice schools, including information about school quality and the availability of transportation options that would allow students to attend school far from home. But perhaps more importantly, our findings indicate that the school bus is critical for ensuring that black and Hispanic choice school students attend higher-quality schools.

Our findings suggest that choice is more likely to lead to meaningful improvements in school quality when accompanied by transportation options, particularly for black and Hispanic students. Whether, or how much, these differences translate into improved educational outcomes remains a question for future research.

Appendix

FIGURE A.1

Differences in Median Unadjusted Growth Percentile between Students with and without Transportation, Students Attending Choice Schools Only, Census Tract Effects, 2015

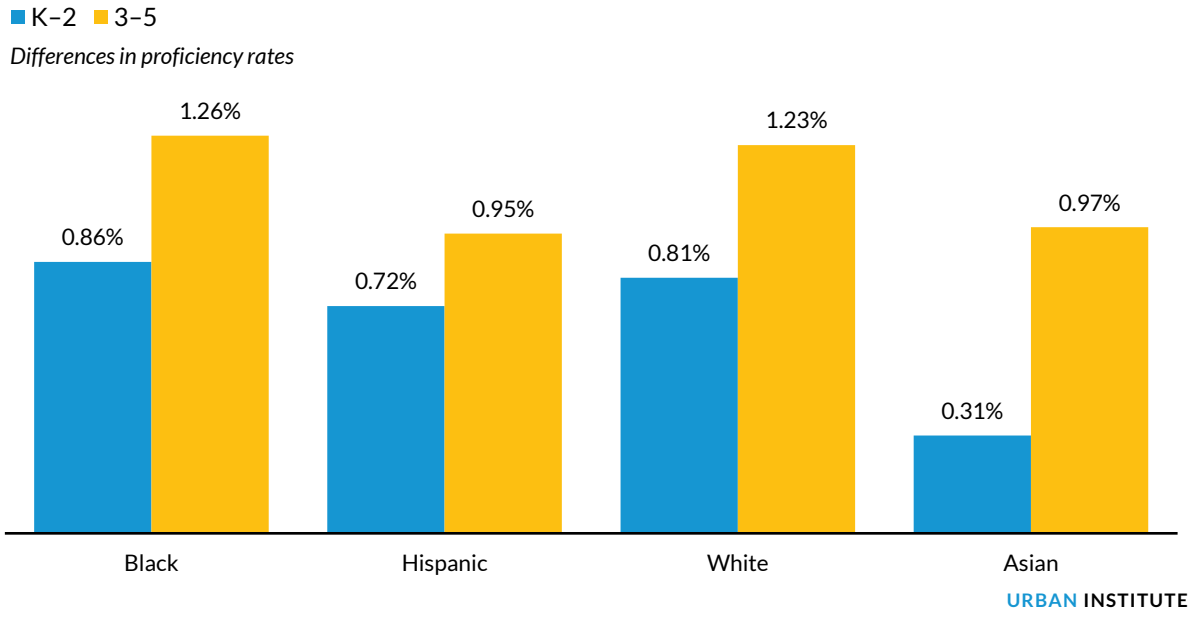


Source: Authors' calculations.

Notes: All results are statistically significant at the 1 percent level. All models include controls for race or ethnicity, gender, limited English proficiency, poverty, and census tract fixed effects. Sample includes K–5 students with transportation, demographic, and attendance data who attend a choice school. Sample excludes students who attend their zoned school, students in charter schools, and students in full-time special education schools.

FIGURE A.2

Differences in Median Unadjusted Growth Percentile between Students Attending Choice Schools and Students Attending Zoned Schools, by Race or Ethnicity, Census Tract Effects, 2015

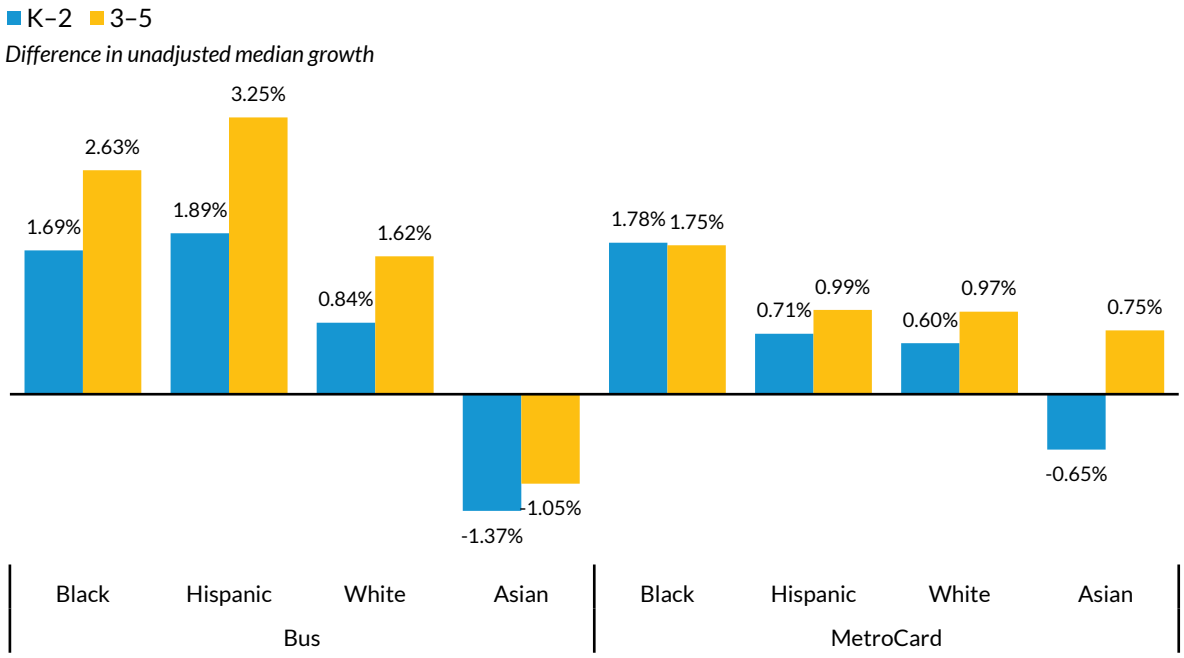


Source: Authors' calculations.

Notes: All results are statistically significant at the 1 percent level, except for Asian students in K–2. All models include controls for gender, limited English proficiency, poverty, and census tract fixed effects. Sample includes K–5 students with transportation, demographic, and attendance data. Sample excludes students in charter schools or in full-time special education schools.

FIGURE A.3

Differences in Median Unadjusted Growth Percentile between Students with and without Transportation, by Race or Ethnicity, Students Attending Choice Schools Only, 2015



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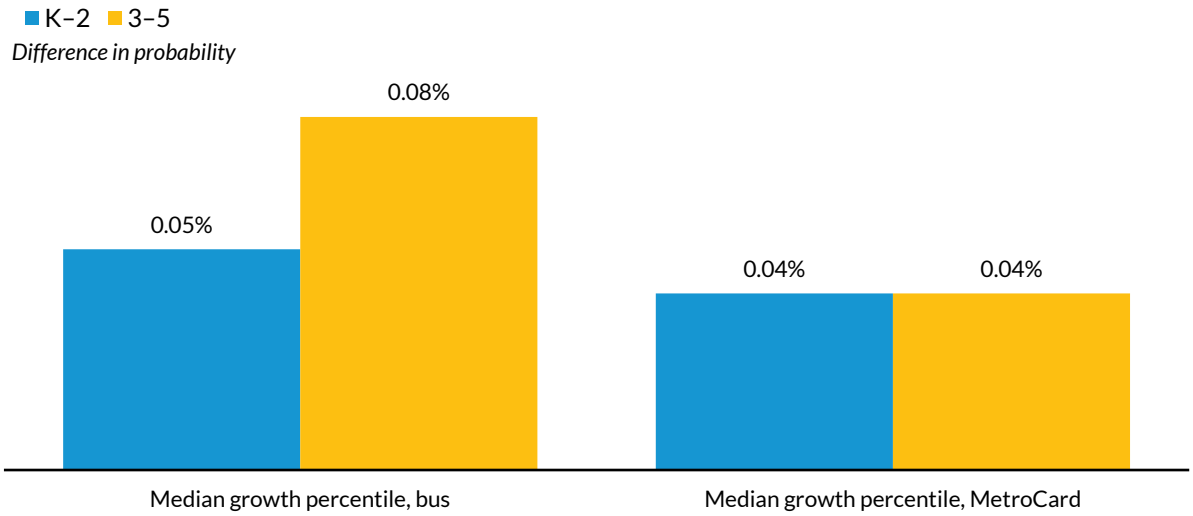
Source: Authors' calculations.

Notes: All results are statistically significant at the 5 percent level, except results for white students in K–2 and results for Asian students. All models include controls for gender, limited English proficiency, poverty, and census tract fixed effects. Sample includes K–5 students with transportation, demographic, and attendance data who attend a choice school. Sample excludes students who attend their zoned school, students in charter schools, and students in full-time special education schools.

FIGURE A.4

Differences in Probability of Attending a Better School between Students with and without Transportation, Students in Choice Schools Only, 2015

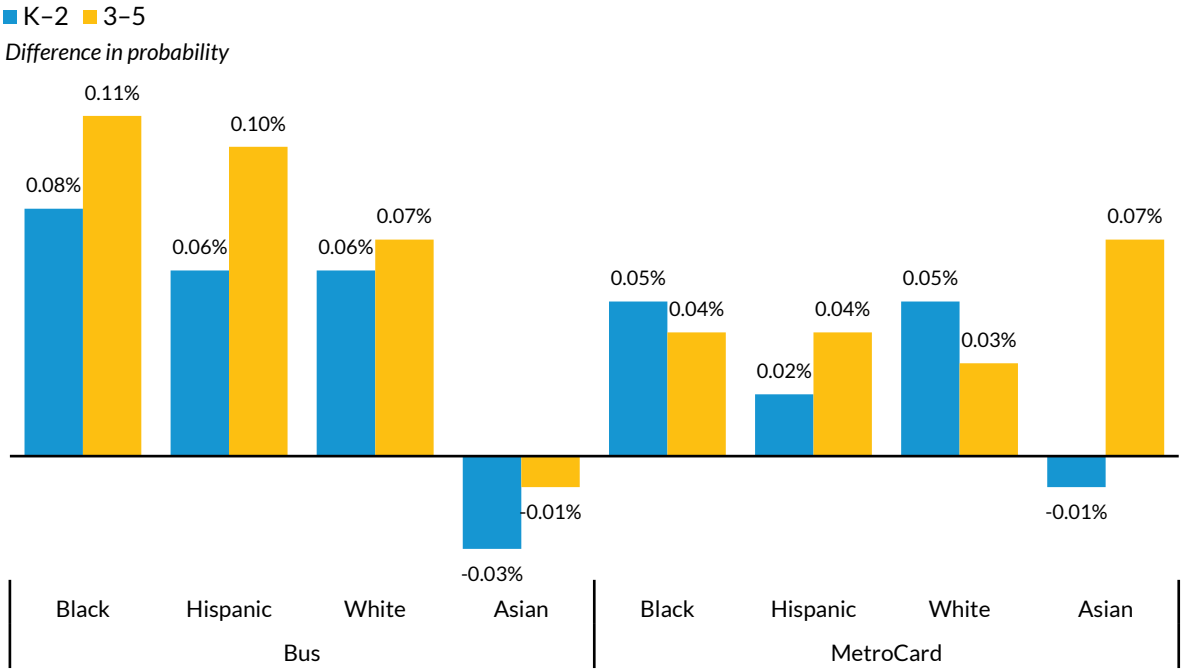


Source: Authors' calculations.

Notes: All results are statistically significant at the 1 percent level. A school is considered better if median growth percentile is at least 5 percentage points higher than a student's zoned school. All models include controls for race or ethnicity, gender, limited English proficiency, and poverty. Sample includes K–5 students with transportation, demographic, and attendance data who attend a choice school. Sample excludes students who attend their zoned school, students in charter schools, and students in full-time special education schools.

FIGURE A.5

Differences in Probability of Attending a Better School between Students with and without Transportation, by Race or Ethnicity, 2015



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Source: Authors' calculations.

Notes: All results are statistically significant at the 1 percent level, except Hispanic students in K–2 using MetroCards, white students, Asian students in K–2, and Asian students in grades 3–5 using the bus. A school is considered better if median growth percentile is at least 5 percentage points higher than a student's zoned school. All models include controls for gender, limited English proficiency, poverty, and census tract fixed effects. Sample includes K–5 students with transportation, demographic, and attendance data who attend a choice school. Sample excludes students who attend their zoned school, students in charter schools, and students in full-time special education schools.

Notes

[1] New York City divides elementary schools into 32 geographic community school districts, each with its own superintendent. Three community school districts in New York City are designated as *choice districts*, allowing resident children to attend any school in that community school district.

[2] In addition, when students make a residential move to a different school zone, they can choose not to change schools. See "Your Options," InsideSchools, accessed September 6, 2018, https://insideschools.org/elementary/your-options.

[3] Door-to-door service is typically provided only to students with disabilities.

[4] The department of education also provides some students with half-fare MetroCards that can be used on city buses only. Our conversations with the Office of Pupil Transportation indicate that the take-up on this is low and that students eligible for this form of transportation live within walking distance of their schools.

[5] The Office of Pupil Transportation advises principals to consider (1) the accessibility of the school's physical location for drop-off or pickup, (2) grade configuration (which shapes ages and developmental phases of students sharing a bus), and (3) parental communication, required to assign and manage route assignments.

[6] Parents find out about availability of bus service at different points in the decision process. For example, students attending out-of-district gifted-and-talented programs are told in their offer letter that bus service is not provided. Other students who attend a choice school within their district may not know whether they will get bus service until they have already enrolled in that school. Further, specific drop-off and pickup times are often not determined until the beginning of the school year.

[7] There are three unzoned community school districts in New York City: district 1 in lower Manhattan, district 7 in the Bronx, and district 23 in Brooklyn. For students in these districts, we consider their zoned school to be the elementary school nearest their residence.

[8] We also explored an alternative measure equal to the average percent of students exceeding standards (the highest performance level) in ELA and math. The results are similar.

[9] Our "choice" indicator is a student-level measure. It is possible that for some students, a particular school is a choice school, and for other students, that same school is their zoned school.

[10] K–2 students who use no transportation fall into two groups: students who are eligible but choose not to use it and students who are ineligible. Sixty-one percent of students fall into the latter category. All students in grades 3–5 who do not use transportation are ineligible.

About the Authors

Sarah A. Cordes is currently an assistant professor of Educational Leadership at Temple University's College of Education. Her research focuses on the ways in which the urban context, including school choice, transportation, housing, and neighborhoods affect student outcomes. Her current projects focus on the effects of pupil transportation on student outcomes and school choice and the effects of diverse-by-design charter schools on students' educational performance and attainment. She is also investigating the effects of charter schools on neighborhood and school segregation. Her research has been funded by the Institute for Education Sciences, the Pennsylvania Department of Education, and the Walton Family Foundation. Cordes received her PhD in public policy from the Wagner School of Public Service at New York University, her master's in public policy from the Sanford School at Duke University, and her bachelor's from the College of William and Mary.

Amy Ellen Schwartz is the Daniel Patrick Moynihan professor in Public Affairs and a senior research associate at the Center for Policy Research at the Maxwell School at Syracuse University. She is an applied economist with research interests spanning issues in education policy, urban economics, and public finance. Previous work has considered infrastructure investment and economic growth; the impact of public interventions (such as housing investment, business improvement districts or charter schools) on property values; intergovernmental aid; and the consequences of education reform. Current projects include an investigation of student mobility; the effects of pupil transportation on student outcomes and school choice; the impact of neighborhood crime on student performance; the link between neighborhoods, schools and child obesity; and the impact of housing vouchers on residential location decisions and children's educational outcomes. Her work has been published in *Educational Evaluation and Policy Analysis*, the *Journal of Human Resources*, *Journal of Policy Analysis and Management*, and *Education Finance and Policy*, among other journals and books. Her research has been funded through grants from federal agencies, such as the Institute for Education Sciences, the National Science Foundation, National Institutes of Health, and foundations, including the Spencer Foundation, MacArthur Foundation, and the William T. Grant Foundation. In 2009, Schwartz was as the president of the Association for Education Finance and Policy. She is on the editorial board of Regional Science and Urban Economics and is the editor of Education Finance and Policy. Schwartz received her PhD in economics from Columbia University.

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