

PolicyBRIEF

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Market Signals: How Do DC Parents Rank Schools, and What Does It Mean for Policy?



We used data from the 2014 school lottery in Washington, DC, to explore how parents' preferences affect the sorting of students into schools under different policies.

More school choice usually means more competition between schools. But whether that competition leads to good or bad outcomes depends on *how* parents are choosing their schools.¹ What features are they looking for? Is academic performance the main factor? Are parents also looking at the characteristics of the students, such as their race and socioeconomic class? Or is convenience—the draw of a nearby school—so powerful that school choice doesn't make much difference? And how do these answers differ by family characteristics and the child's age?

Knowing the answers to these questions could help policymakers design better rules to govern school choice and “nudge” parents toward choices that produce good outcomes. Such outcomes include better academic performance; more disadvantaged students enrolling in high quality schools; and more integration of schools by race, ethnicity, and social class.

This brief summarizes a [technical report](#) that describes what parents look for when they choose a school. We used these findings to explore how parents' preferences affect the sorting of students into schools under different policies. The data we used come from the 2014 school lottery in Washington, DC, where families submitted rank-ordered lists of their preferred schools from a long list of options, including charter schools and traditional public schools. Collectively, these parent-submitted rankings provide a powerful “market signal” about what school attributes are in the greatest demand. We compiled detailed data on the schools and the families that ranked them and calculated the preference weights that gave rise to the rankings.

We found that, although parents generally prefer schools close to home, they also place significant weight on the academic performance of the school and the characteristics of its students, including their race and income. These weights vary somewhat across parents, with notable differences by parents' race/ethnicity and income.

DC: A MARKETPLACE FOR SCHOOLS

The District of Columbia is an excellent setting for studying public school choice because it's a mature education marketplace. Charter schools have been in place for nearly 20 years in DC, and DC Public Schools (DCPS) has offered a process for parents to apply to schools outside their neighborhood for many years as well.

DC families at every grade level face an array of public school alternatives. They may choose from more than 100 public charter schools—all tuition free—with spaces assigned by lottery if there are too many applicants. They may also apply for open spaces in any of the more than 100 traditional district schools that are part of DCPS. Starting in 2014, the city launched a single, central application system—My School DC—to which all families submit one set of ranked preferences for schools, including district-run schools and charter schools. Our study uses those data.

A RICH SET OF DATA

This study draws on more than 20,000 rank-ordered lists of schools submitted by parents in spring 2014. We looked at students entering elementary, middle, and high school separately and merged the school-choice data with

extensive data on the attributes of those schools and the students who chose them.² Our data on the schools' attributes came from My School DC—the same site that provided the information to parents—and our data on the students came from the applications to My School DC and from school enrollment records. We also merged information on family residences and schools' locations with neighborhood data from the U.S. Census and from the Uniform Crime Reporting statistics, as reported to the DC Metropolitan Police Department, to account for the roles of neighborhood crime and demographics in school selection.

To use these data to interpret the market signals sent by parents, we applied statistical methods that are common in areas of research where consumers select from menus of alternatives.³ These methods allowed us to measure the rates at which parents traded off school attributes when they ranked schools. These methods have been used to analyze similar data in other cities.^{4,5}

ACADEMICS VERSUS DISTANCE AND DEMOGRAPHICS

Among DC families, several factors are associated with ranking a school highly. These include the convenience of getting to the school and the characteristics of the students at the

How far a typical middle school parent would be willing to go for...

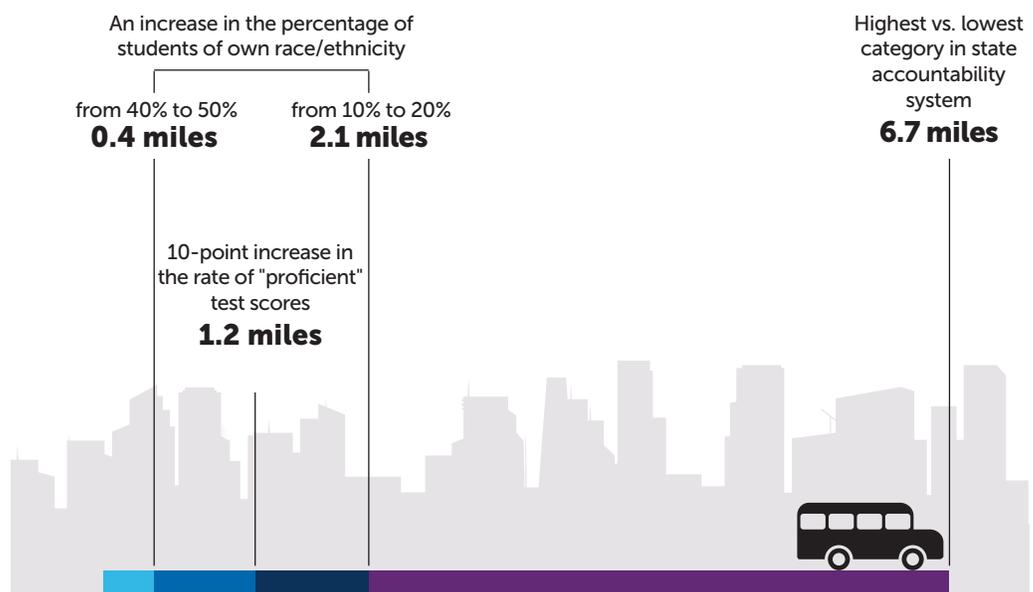


Figure 1

school. They also include academic performance, which DC officials measure in several ways, including the proficiency rate (the share of students who score above a certain level on the state standardized test) or the accountability ratings that schools receive based on a set of criteria, including test scores and changes in test scores over time.

We estimated how much each factor affected families' ranking of schools. We then used this information to calculate the distance that the average family would be willing to send their child to attend a school with a more desirable attribute (Figure 1). For example, if two schools were exactly the same except that one school had the highest possible rating under the state accountability system and the other school had the lowest rating, the typical family would be willing to send their middle school student almost 7 miles farther to attend the higher-rated school.⁶ Similarly, if two schools differed by 10 points in the percentage of students who scored "proficient" on the state standardized test, parents would be willing to send their child up to 1.2 miles farther to attend the higher-scoring school.

Parents tend to rank schools higher if there are more students in the same race/ethnic group as their own child. But the strength of this "own-group" preference differs by grade level, the

applicant's race/ethnicity, and the percentage of a school's students in the child's own group. For example, this preference is strongest when the own-group percentage is relatively low. As that percentage rises, the relationship weakens and even becomes negative—suggesting a taste for diversity.

As Figure 1 shows, typical middle school parents would be willing to send their child half a mile farther to attend a school that had 50 (rather than 40) percent of students of the same race/ethnicity as their own child. But if the choice were between a pair of schools with 10 versus 20 percent of students of the child's own race/ethnicity, the parent would be willing to send the child over two miles farther to avoid being in the smaller minority.

WHAT IT MEANS FOR SEGREGATION BY RACE

To better understand what these trade-offs mean for policy outcomes, we used them to simulate the sorting of students into schools under different policies. For each policy simulation, we calculated several outcomes, including the level of segregation at the schools. We used a measure ranging from 0 (total integration, in which every school has the same racial mix as the entire city) to 100 (total segregation) to capture how well students were balanced across schools by race

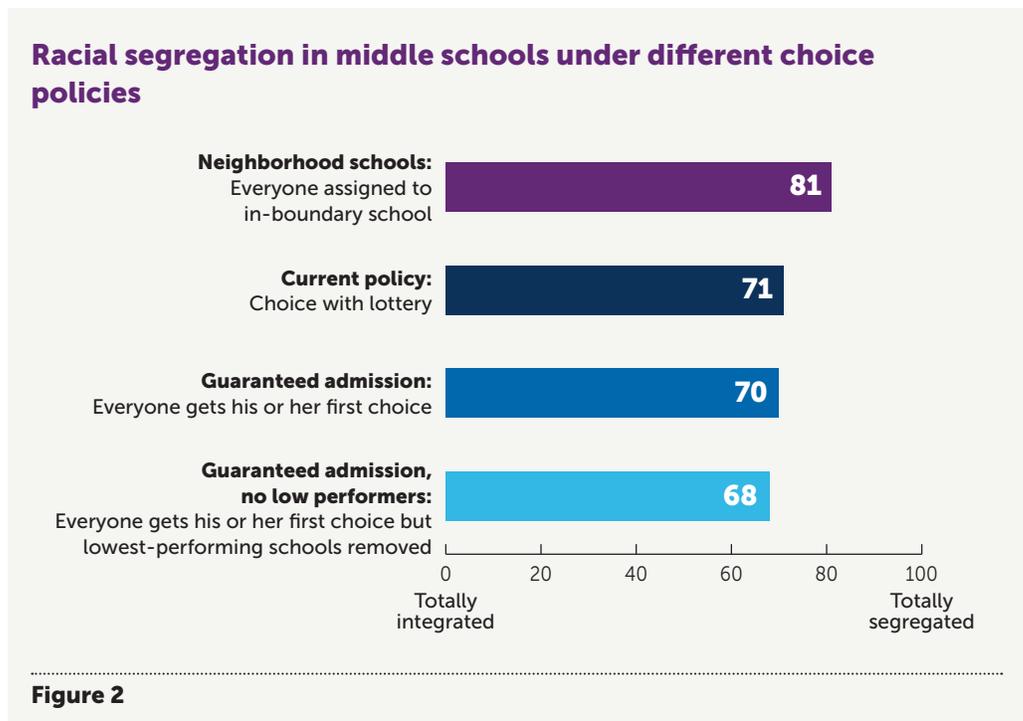


Figure 2

(white versus nonwhite) and income (low-income versus not low-income).

The 0 to 100 range can be thought of as the percentage of students in a given group—say, white students—who would have to be reassigned in order for every public school in DC to have an equal percentage of white students. For example, if the city had 35 percent white students, an index value of 0 means that every school was exactly 35 percent white. But an index value of 50 means that 50 percent of the white students would have to be reassigned to have the same white/nonwhite ratio in every school.

For middle schools in DC, we found that school choice, as it operates now, leads to less segregation by race compared with a system of neighborhood schools, in which everyone attends the school within his or her attendance boundary. We also found that several other ways of implementing school choice lead to similarly lower levels of segregation (Figure 2). And these alternatives could possibly reduce segregation even more, though the differences in segregation resulting from these alternative policies were relatively small.

To arrive at these findings, we ran several simulations. First, we measured segregation under a policy that assigns all students to their default *neighborhood school* and found

the segregation index for race was 81. In comparison, note that the actual enrollments for the 2014 school year resulting from the lottery—which we refer to as *current policy*—yielded a value of 71 (Figure 2).

We then used our model to predict the distribution of students under a policy of *guaranteed admission*, in which everyone is allowed to attend his or her most preferred school, and the number of seats at each school is unlimited. This is a hypothetical policy that cannot be implemented in the short run, but it provides a useful way to understand the effects of gradual changes in school capacity by showing what would happen at the extreme.

Because the choice process can change the student body at each school, which in turn can affect parents' preferences for a school, we repeated this exercise several times, updating schools' student body characteristics each time. When the student population stabilized, the segregation index settled on 70 for middle schools.

Finally, we tested the guaranteed admission policy again but *omitted the lowest-performing schools* (based on state and charter accountability ratings) from the list of possible options. Again, we updated the student body composition at every school and repeated the choice process for

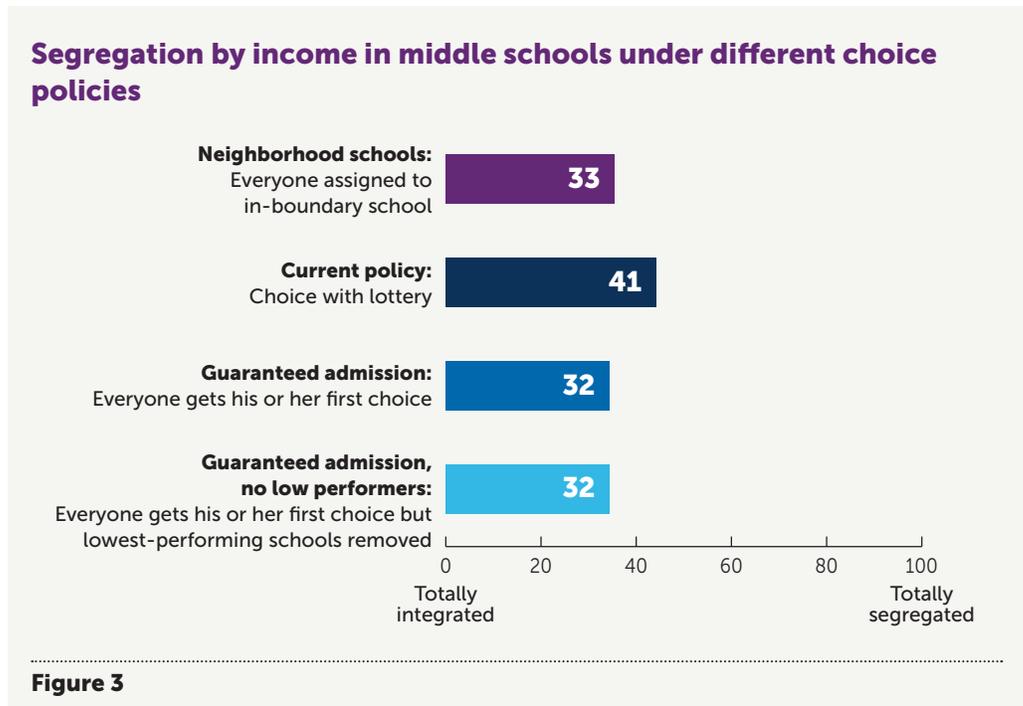


Figure 3

successive rounds until enrollment stabilized, resulting in a slightly lower level of racial segregation (68).

The results for students entering elementary and high school were similar to those for middle school. Elementary and high school students were no more segregated under the guaranteed admission policies than under the neighborhood schools or current policy. The only way in which middle school results differed from elementary and high school was the ordering of neighborhood schools and current policy, which was reversed (the current policy led to higher segregation than neighborhood schools).

WHAT IT MEANS FOR SEGREGATION BY INCOME

When we repeated this exercise but calculated the segregation index based on income, we found that all of the alternative policies, including assigning students to their own neighborhood schools, led to less segregation than the current policy for middle and high schools.

All three alternative policies have a segregation index of 32 to 33 for middle schools, compared with 41 for the current policy (Figure 3). The elementary level showed a similar pattern, except that the values for the two guaranteed admission policies were closer to the current policy value

of 36, and the neighborhood schools policy produced slightly more segregation by income (40). The pattern of results for high school applicants was similar to that of middle school applicants described above.

Taken together, these results suggest that the simulated policies produce relatively small differences in segregation by income, compared with segregation by race. However, opening up more seats at popular schools is not likely to increase segregation by income—and may slightly curb it.

WHAT IT MEANS FOR ENROLLMENT IN HIGH-PERFORMING SCHOOLS

We also examined whether the different policies would increase enrollment in schools that were higher- versus lower-performing in the year before the lottery. The analysis shows that, compared with assigning students to their neighborhood schools, the current policy leads to many more middle school students attending schools with the highest rates of test proficiency (Figure 4). This was true for elementary and high school as well.

For all grade levels studied, both of the guaranteed admissions policies result in more students attending schools with higher proficiency rates, compared with the neighborhood schools or current policy.

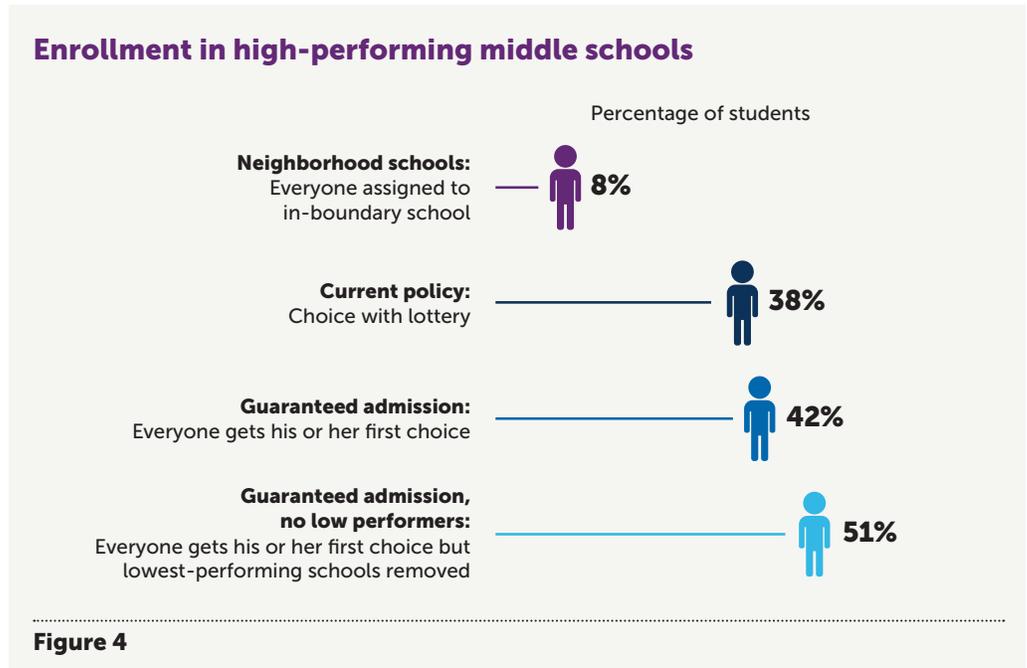


Figure 4

LIMITATIONS OF THE STUDY

Three caveats should be kept in mind when reviewing the results of this study. First, the school ranking information we used excludes the parents who did not take part in the DC school lottery. Rather than applying to schools through this lottery, some students either opted to attend their default neighborhood school or continued to attend a school to which they were already admitted. Still others opted out of public schools altogether. The families of these students may have different preferences for schools than those who took part in the lottery, and thus our results may not reflect the average preferences of all families in DC.

Second, we did not address the type of school choice made when families move. Some families may relocate to be closer to schools that are better along some dimension we cannot measure. If this is the case, our findings on the relationship between distance and school preferences will overstate the importance of distance on school choice.

Finally, although we used a rich set of data on the attributes of schools and students, we did not look at all the factors that may affect school preferences. These factors include students' own academic abilities or extracurricular programs offered by schools, such as music, sports, or special services. Such factors were shown by recent research to be relevant and could have improved the explanatory power of our model, had data about them been available.⁷

Despite these important limitations, this study offers useful insights into the factors that underlie school choices. It also provides a framework for using these insights to predict how different policies might lead students to sort themselves into schools.

ENDNOTES

¹Throughout this brief, we refer to “parents” or “families” as shorthand for people who make education decisions for a child. These people can be parents, guardians, relatives, or the students themselves.

²The results in this brief focus on middle schools, but findings for applicants to elementary and high schools can be found in the full working paper ([https://www.mathematica-mpr.com/~media/publications/pdfs/education/2016/market signals wp 45.pdf](https://www.mathematica-mpr.com/~media/publications/pdfs/education/2016/market%20signals%20wp%2045.pdf)).

³The methods are discrete choice regression models, such as the rank-ordered logit, discussed in detail in the full working paper ([https://www.mathematica-mpr.com/~media/publications/pdfs/education/2016/market signals wp 45.pdf](https://www.mathematica-mpr.com/~media/publications/pdfs/education/2016/market%20signals%20wp%2045.pdf)).

⁴See Harris, Douglas N., and Matthew F. Larsen. “What Schools Do Families Want (and Why)?” New Orleans Education Research Alliance. January 2015. Available at <http://educationresearchalliancena.org/publications/policy-brief-what-schools-do-families-want-and-why>. Accessed June 2, 2016.

⁵See Hastings, Justine, Thomas Kane, and Douglas Staiger. “Parental Preferences and School Competition: Evidence from a Public School Choice Program.” National Bureau of Economic Research. Updated December 2006. Available at <http://www.nber.org/papers/w11805>. Accessed June 2, 2016.

⁶For reference, commute distances in DC range from 0 to 13 miles.

⁷See Harris and Larsen (2015).

