Is it the neighborhood or is it the school? Characteristics of neighborhoods with high in-boundary participation

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Background

There is a high degree of school choice in D.C. In school year 2016-17, 46 percent of public school students attended a public charter school, and 21 percent attended DCPS school other than their in-boundary choice. Only 27 percent attended their in-boundary DCPS school.

Schools are among the most important factors in whether and where families locate in the city when their children reach school age. Given the large element of choice in D.C., we are interested in how neighborhood characteristics and school choices correlate.

Research on observed school choice shows that that parents prioritize non-academic factors that are related to demographics and location, including changing demographics of the school and its neighborhood, own-group presence, safety, and convenience. Our study evaluates these neighborhood characteristics as well as others to identify common attributes associated with schools that draw many students from their boundaries.

Methods and Data

To compare in-boundary participation for DCPS schools and school neighborhood characteristics, we first construct school boundary neighborhoods out of U.S. Census block groups and create a dataset of school boundary characteristics. We then model in-boundary participation rates on neighborhood characteristics.

To conduct the analysis, we start with correlations between boundary participation rates and neighborhood characteristics separately for elementary schools and together for middle and high schools. We consider variables related to school choice in the literature (changing demographics, own-group presence, safety, and convenience) as well as general neighborhood factors (education level, poverty, single mother households, home ownership, public charter schools, and growth in school-age population). Next, we evaluate whether neighborhood characteristics for the schools with the in-boundary participation rates in the highest 25th percentile are the same as other schools using t-tests. Lastly, we fit a model with moderately and strongly correlated neighborhood factors to identify schools that have more or less in-boundary students choosing their in-boundary school than expected.

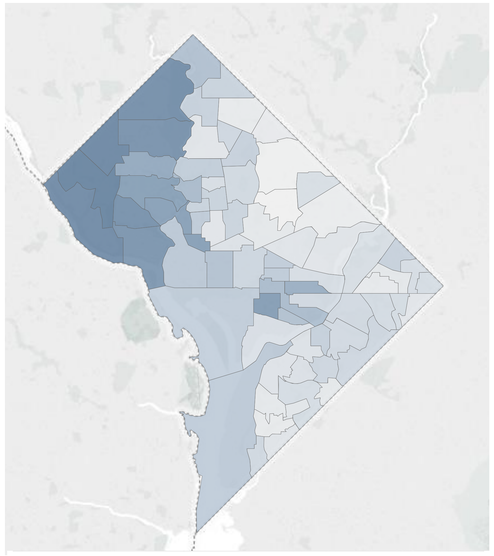
Our data sources include in-boundary participation rates from DME, population characteristics from the U.S. Census Bureau 2012-2016 ACS 5-Year Estimates for block groups, school demographics and addresses from OSSE, school boundary shape files from DC Open Data, crime data from MPD, and the number of transit stops from WMATA and DDOT.

Finding 1: Neighborhoods with schools that draw many students do share common characteristics

When families choose a neighborhood along with their school, they most likely choose an in-boundary elementary school located west of Rock Creek Park and in a few pockets of Capitol Hill (in-boundary schools are DCPS schools that a student has a right to attend based on where the student lives). Otherwise, families choose an out of boundary DCPS or public charter school separately from their housing decision.

In-boundary schools that many nearby families choose tend to be located in neighborhoods with more residents who have a high school diploma, a growing but small African American population, lower African American populations, fewer single mother households, less violent crime, and less poverty. There was no consistently moderate or strong correlation for the presence of public charter schools, transit access, difference between school and neighborhood demographics, growing school-age population, or owner-occupied housing.

Elementary school neighborhoods and in-boundary participation rates

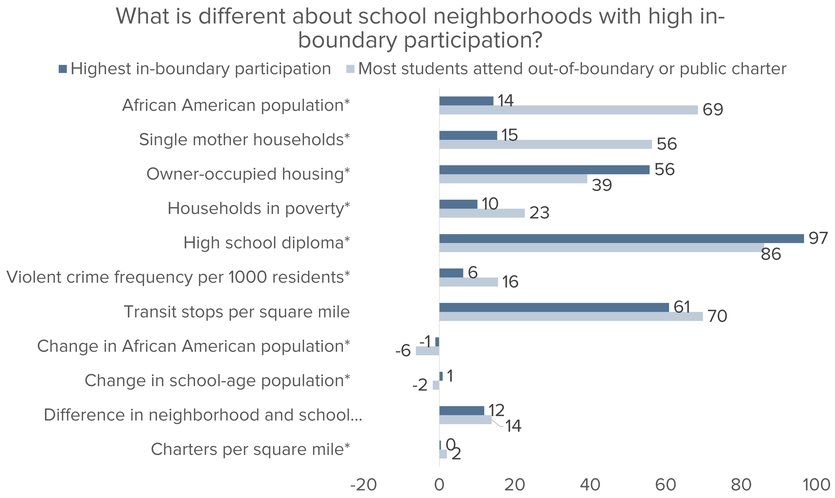


Correlation between in-boundary participation rates and neighborhood characteristics

Neighborhood characteristic	Correlation coefficient (r) Elementary	Middle and High
Population who is African American	-0.75	-0.63
Households headed by single mothers	-0.67	-0.55
Violent crime	-0.62	-0.50
Poverty rate	-0.49	-0.41
Change in African American population	0.46	0.52
Population with high school diploma	0.72	0.52
Charters per square mile	-0.39	-0.28
Transit access (convenience of options)	-0.27	-0.09
Difference between neighborhood's and school's African American population	-0.05	0.08
Increase in school-age population	0.37	0.43
Owner-occupied housing	0.36	0.13

Note: Moderate and strong correlations are highlighted in gray if correlation coefficient (r) has an absolute value between 0.40 and 0.59 for moderate and above 0.60 for strong.

Finding 2: School neighborhoods with high in-boundary participation are the most different in terms of African American populations and single mother households



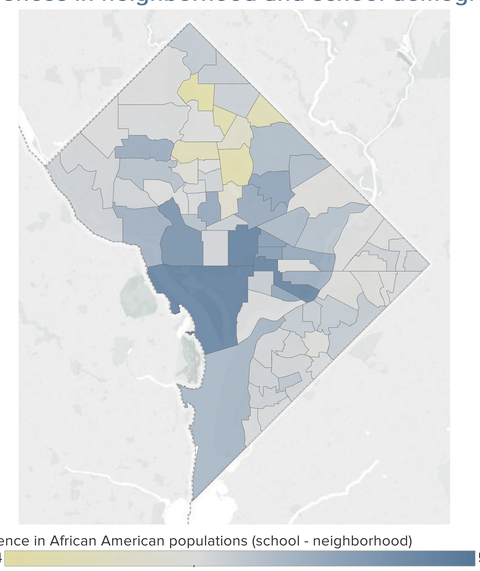
Neighborhoods with schools that have the highest in-boundary participation (75th percentile or above) have much lower percentages of African American residents and single mother households. These school neighborhoods are significantly different from schools who don't draw in-boundary students in high numbers in most characteristics. Transit access and difference between school and neighborhood demographics are statistically the same for both groups.

*Indicates significant difference.

Finding 3: Two clusters of neighborhoods have large differences in demographics between the in-boundary schools

Comparing African American populations of the neighborhood and the school, schools in the area highlighted in yellow below have a lower share of African American students when compared to the school's neighborhood, meaning that African American students are more likely to leave for other schools. The opposite is true in the darkest blue neighborhoods, where African American students are overrepresented compared to the school neighborhood population.

Differences in neighborhood and school demographics



Finding 4: A few in-boundary elementary schools draw more or less students than expected given the school neighborhoods

In a model that jointly considers all factors with a strong or moderate correlation and controls for the Wilson feeder pattern, there are three hidden gems and six schools that shouldn't be as popular as they are (aside from the most and least popular schools).