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How Do Students Value an Elite Education? Evidence on Residential Location and Applications to NYC Specialized Schools

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Working Paper 23-04

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How Do Students Value an Elite Education? Evidence on Residential Location and Applications to NYC Specialized Schools

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Abstract

Are students willing to endure long commutes for access to good schools? Using New York City Department of Education administrative data matched with Google transit directions, we find that longer commutes from home markedly deter students from applying to even the most elite high schools. For the top public school in New York State, a student with a 20 minute commute is 74% more likely to apply than one who lives 40 minutes away. For two other schools above the 99th percentile of performance, the differences are 234% and 137%. We also find that eighth grade exam scores relate to how well students understand the admissions process. As far as we are aware, we are the first to have the required location precision to track specific commutes for individual high school students. From a policy perspective, our findings imply that – while expanded school choice may be desirable – housing access near good schools is quite important.

Keywords: education · school choice · housing access

JEL Classification: I20 · R20 · R21

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1. Introduction

Despite extensive work on willingness to commute from home and wages, we know little about how teenagers value the trade off between school quality and commute time. School access is a popular education policy topic, but might proximity be more important? Our findings suggest so, and thus access to good schools could be of second order importance relative to housing access.

We address this topic by estimating how commutes affect students' willingness to apply to the best public schools in New York City.[1] An NYC Department of Education administrative dataset provides us access to students' demographic characteristics, standardized test performance, place of residence, and preferences for the city's highly selective exam high schools. From this, we use their location data and Google's mapping service to find transit times and mode (subway, bus, number of transfers, *etc.*). With the resulting data, we estimate a discrete choice model for the likelihood that a student applies to a particular school. We find that longer commutes make students dramatically less likely to apply to even the best high schools. The effect size increases as school quality falls (in our sample, from the best[2] public school in the state to one at the 99th percentile). We also find that relative commute times matter. Students are less likely to apply to a school if they have shorter commutes to an alternative option, though this dynamic is much weaker for the top school, Stuyvesant.

The relationship between commute time and likelihood of applying to a school is strong and robust to several specifications. These include: the choice of whether to apply to a school; the choice of which school to rank first; and specifications that include the type of commute entailed (walking, bus, subway, number of transfers, *etc.*). When we drop low scoring students (*i.e.*, those we might say never have a realistic chance of scoring high enough to qualify for a selective school) from the sample the relationship tends, if anything, to get stronger.

Additionally, we find students who do well on the Specialized High School Admissions Test (SHSAT) tend to have a better understanding of how the admissions process works (or perhaps their parents do anyway).[3] Specifically, they are less likely to rank exam schools in an illogical way.[4]

This paper's setting is novel because, as far as we are aware, it is the first to combine data on student-level application behavior, address, and commuting patterns. The main contribution is that we are the first to quantify how commutes, school prestige, and application likelihood are related. This schooling setting differentiates our work from commuting studies that look at travel time and salary trade-offs in job choice among adults.

In section 2. we discuss related literature. Section 3. provides background on NYC exam schools, describes our data sources, and notes our observational findings. Section 4. presents the discrete choice model and section 5. describes the results. Section 6. concludes.

[1] And, by extension, New York State and nationally (3rd and 36th per *US News* rankings).

[2] Measured by average SAT scores for graduating students. See Dobbie and Fryer (2014) and Abdulkadiroglu, Angrist, and Pathak (2014).

[3] The SHSAT is the standardized admissions test for the exam schools.

[4] See Figures 2 and 3 and the accompanying description.

2. Literature Review

Subject-wise, this paper relates to the commuting literature and a body of work describing the relationship between home location and educational outcomes. In terms of the setting (*i.e.*, NYC's exam schools and selective schools more generally), this paper relates to a body of work that has focused on peer effects.

2.1 Neighborhoods, Commutes, and Student Achievement

We study commutes in a discrete choice setting, so this paper descends from McFadden (1974), which introduced discrete choice methods to study urban subway demand.

The present paper concerns how students' home location affects academics. In that vein, there are a set of papers that measure home location effects on educational outcomes. Cordes, Schwartz, and Stiefel (2017) evaluate the effect of moving on students' outcomes in NYC. Mayock and Vosters (2022) look at how home moves induced by changes in the supply of rental apartments affects school access. Laliberté (2021) finds that neighborhoods' effects on educational attainment are mostly due to school quality. Chetty and Hendren (2018a) show that childhood neighborhoods shape everything from college attendance likelihood to fertility; Chetty and Hendren (2018b) measure this neighborhood exposure effect for US counties.

Topic-wise, Trajkovski, Zabel, and Schwartz (2021) is a closely related paper. They also use NYC data to evaluate the effect of distance on school choice, asking whether access to school busses leads to families enrolling in kindergarten farther from home. They find a small effect[5] and are subject to a couple limitations: They lack home location[6] and distance is measured geographically rather than by commute time.[7]

Corcoran (2018) provides an overview of NYC school commuting patterns in describing student-level data. He observes that, among other things, black students seem to travel the farthest to school, girls travel farther than boys, differences in travel times by demographic groups are related to residential segregation, and students who do not match with first choice schools tend to have second choices that are closer to home than their first choice would have been.[8]

Beyond an education setting, there are numerous papers on commuting. Particularly relevant to our results, Kreuger and Mueller (2016) find that willingness to commute does not change much with unemployment duration; that is, workers seem willing to accept lower salaries as unemployment drags on but unwilling to increase their commutes.[9] Another example is Barbanchon, Rathelot, and Roulet (2021), who find that willingness to commute differences by sex account for a portion of the gender wage gap in French data.

Notably, prior work finds 1) neighborhood location seems important to educational achievement and 2) people do not like commuting and unwillingness to commute appears to impede earning ability. Taken in tandem, these findings track with ours: willingness to apply to even the very best schools declines precipitously as

[5] Bus access is akin to living 0.24 miles closer, which is about a five minute walk.

[6] Their data only indicate ranges, *e.g.*, if a student is 0-0.5 miles from a school, 0.5-1, *etc.*

[7] This is a notable problem in New York where transit access is important. When the authors do look at time, it's walking times only. Moreover, their mapping software, Open Source Routing Machine, does not include transit as an option.

[8] For commute differences by sex, cannot tell whether this is due to a higher willingness to commute among girls or whether higher academic performance among girls leads them to be more likely to match with more prestigious schools farther from home.

[9] This is a side point as the paper mainly studies reservation wages.

commute time increases. We add to the literature in our ability to study the trade-off directly.

2.2 Peer Effects

While this paper focuses on commutes, NYC specialized high schools are often the setting for peer effects studies due to a sharp discontinuity in peer attributes at the admissions threshold. Most notably, Dobbie and Fryer (2014) apply NYC DOE data in a regression discontinuity evaluation of how attending a specialized high school affects SAT scores, likelihood of attending college, *et cetera*.[10] Similarly, Abdulkadiroğlu, Angrist, and Pathak (2014) study peer effects in NYC specialized schools; although, their paper also uses Boston school data (and, given Boston's different admissions criteria, the sharp RD design employed by Dobbie and Fryer is not applicable). These papers, and others outside of the NYC setting such as Zimmerman (2003), find small or no effects of peers on academic outcomes such as SAT scores and college attendance rates.

Shure (2021) finds that non-cognitive traits (*i.e.*, personality) of peers influence achievement.[11] Griffith and Rask (2014) look at the peer effect from school roommates specifically, this time in a higher education setting, finding positive peer effects that are small for measures such as standardized test scores but more substantial for measures such as grades.

The current paper relates to the peer effects literature in that we employ an administrative dataset that has mostly been used in that context. We differ in that we apply it (as well as additional commuting/location data) to a different sort of question.

3. Data and Background

This section includes background information on NYC's specialized high schools, a description of our administrative data, a description of our commuting data, some basic facts from the combined dataset, a description of students' preferences over schools, and an overview of the admissions algorithm.

3.1 NYC Specialized High Schools

New York City has hundreds of public high schools. Of these, the Specialized High Schools are a distinct class: in terms of student achievement, they range from Stuyvesant, on several measures the best public school in the state, down to Brooklyn Tech at the 99th percentile of SAT scores (*i.e.*, students at Stuyvesant, on average, score better on the SAT than students at any other high school in New York State; students at Brooklyn Tech score better than 99% of high schools.).[12] By law, the Hecht-Calandra Act, the only admissions criterion is a student's score on a standardized test, the SHSAT. Thus the exam schools are among the most selective high schools in the city; but, there are other prestigious public high schools with their own admissions processes.[13]

There are nine specialized high schools. Eight of these use the SHSAT (the other, LaGuardia, is a performing arts school). Of these eight, we focus on the larger original exam schools: Stuyvesant, Bronx Science,

[10] They draw from the same institutional data as this paper but do not have access to student Census blocks, some of our demographic information, and are restricted to a shorter time period. The paper measures peer effects because, as the authors argue, teachers, class sizes, and other observables pertaining to instruction are similar between exam schools and normal ones; whereas, student academic performance at exam schools vastly exceeds normal ones.

[11] Using measures peers' personality instead of academic ability is the novel piece here.

[12] Dobbie and Fryer (2014) describe this ordering in detail.

[13] Hunter College High School for instance.

Brooklyn Tech.[14] We leave out Staten Island Tech because we drop Staten Island from the sample: it has a much smaller population than any other borough and transit options are more arduous.[15] [16] Thus, irrespective of other factors, applicants on Staten Island tend to preferentially only apply to Staten Island Tech; conversely applicants from other boroughs tend not to apply there.

Additionally, we consider the High School of American Studies at Lehman College equivalent to Bronx Science since the schools are co-located on the same campus.[17] We do not focus on the remaining three exam schools for two reasons:[18] First their programs tend to be small (a maximum of about 200 seats per grade as opposed to about 1,000+ at the schools we consider). Second, the prestige hierarchy is less clear-cut for these ones; whereas, it is common knowledge that, among the original exam schools, Stuyvesant is the most prestigious, followed by Bronx Science, then Brooklyn Tech. However, we do include them (combined together as an "other" category) in our multinomial analysis of students' first choice schools.

With respect to the Stuyvesant, Bronx Science, Brooklyn Tech hierarchy, the SHSAT score cutoffs for each school vary from year to year *but* the cutoff for Stuyvesant is always higher than the one for Bronx Science, which is always higher than the one for Brooklyn Tech. See the shaded score ranges in Figure 1 for the cutoff ranges relative to Brooklyn Tech in our data.

3.2 Administrative Data

We use confidential student-level administrative data provided by the New York City Department of Education. The sample is composed of students taking the SHSAT in eighth grade in years 2005-2014.[19] For each student in the sample, we have SHSAT scores in eight grade, whether or not the student took the SAT, SAT scores if taken, free/reduced lunch status, census block of home address, the student's ranked list of exam schools, and the high school attended. Once we drop students from Staten Island as noted above, our sample includes 175,739 students.

3.3 Residential Location Data

Our student-level data includes the Census block where each individual lives. Fortunately for our purposes, in New York City, Census blocks are typically about the size of a single city block, often smaller. Thus, we can use the centroid of a block in place of a student's address. A standard NYC block is 900 feet wide so, at most, we may be off from a student's actual address by 450 feet, which is a bit longer than a soccer field, or under a two minute walk for a typical adult.

With the Census block centroids as origin points, we use Google's mapping API to generate commuting profiles for each student and school pair. The data include the amount of time it takes to get to each school and the commute mode (subway, bus, walking, or some combination). We also know the number of transfers

[14] The eight are Stuyvesant; Bronx Science; Brooklyn Tech; Brooklyn Latin; High School for Mathematics Science, and Engineering (City College); High School of American Studies (Lehman College); Queens High School for the Sciences (York College); and Staten Island Tech.

[15] Staten Island Tech was upgraded to an exam school in the 1980s.

[16] To get to any exam school not on Staten Island, students there would need to take a ferry or an express bus, which differ from the subways and city busses we consider elsewhere.

[17] The impact of this assumption is marginal, resulting in only a few thousand additional applications to Bronx Science (as we define it) out of a sample of just over 175,000 students.

[18] These were added during an expansion of the specialized high schools in the early 2000s.

[19] We restrict to these years as they are the ones for which we have the students' census blocks, rather than the larger census tracts.

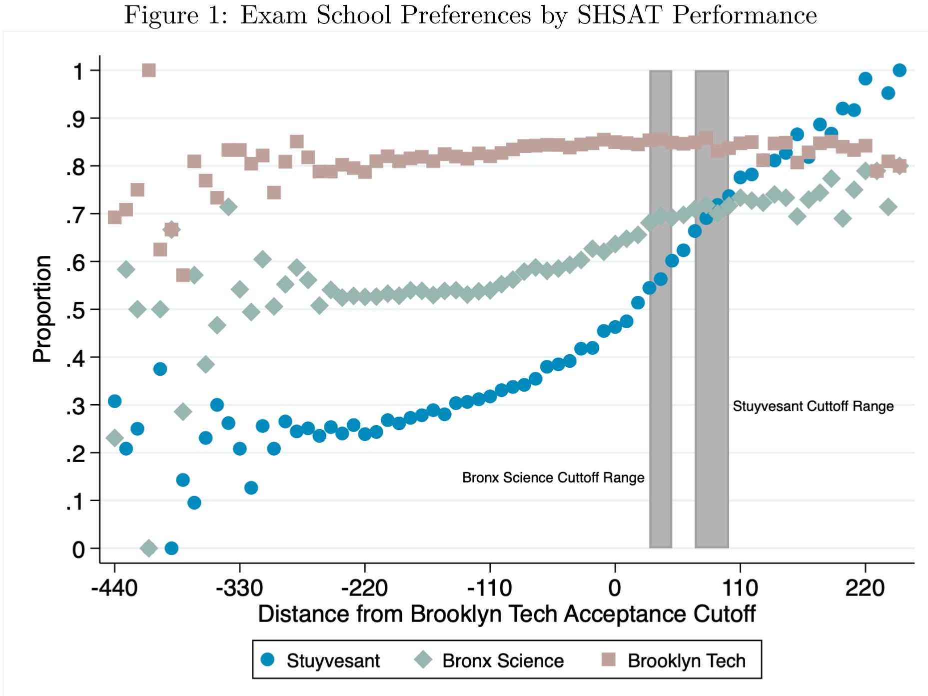
required and the amount of time spent on each mode (in the case of a multi-mode commute). Generating commute times requires choosing a day and time to have Google calculate the trip in addition to the start and end points.[20] We randomly select a weekday in the distant future for each unique block-school pair and compute commute time to arrive at the school at 7:00 am EST (an hour before the start of the school day). Choosing a time in the distant future prompts Google to report commute times for average traffic conditions (*i.e.*, without idiosyncratic service changes).

These commuting profiles provide us with Google's suggested trip for each student. We do not know whether he or she takes that exact trip every day. For instance, someone who lives in the West Village would have a quick subway ride to Stuyvesant in our data. An alternative would be a moderate distance but pleasant walk. She might opt to walk in nice weather but take the subway when it rains.

3.4 Student School Rankings

In Figure 1, we plot the portion of students who rank each of the traditional exam schools (Stuyvesant, Bronx Science, and Brooklyn Tech) by their SHSAT score relative to the cutoff for getting into Brooklyn Tech (the least selective exam school). Irrespective of SHSAT score, roughly 80% of students include Brooklyn Tech on their ranking list. However, likelihood of ranking Stuyvesant or Bronx Science increases as SHSAT scores increase, roughly following a logistic pattern; the trend is much more pronounced for Stuyvesant.

Figure 1: Exam School Preferences by SHSAT Performance



This figure plots the proportion of students who rank a particular exam school by their SHSAT score.

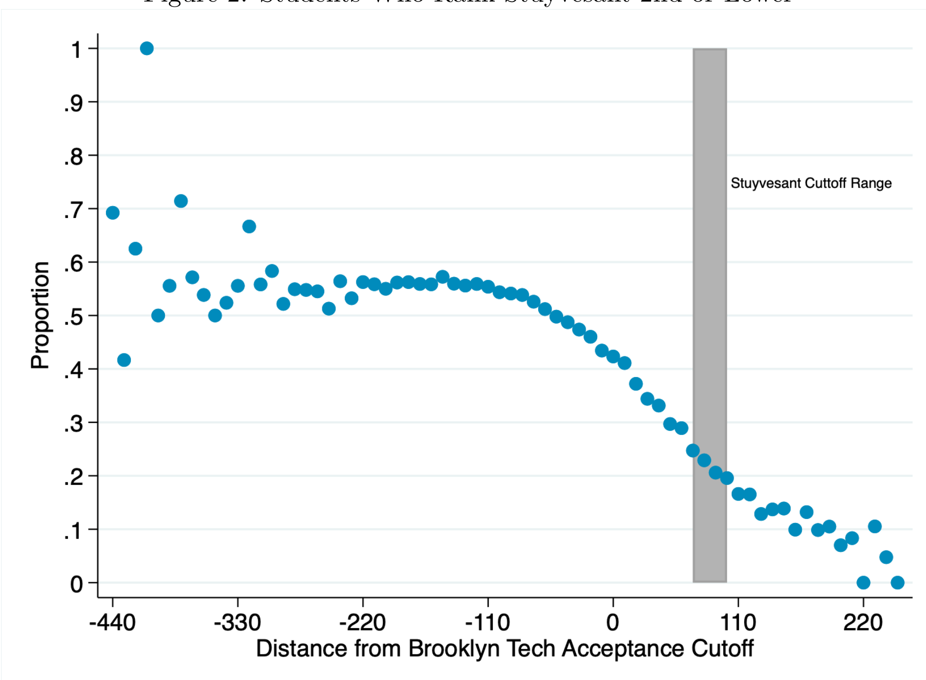
Among traditional exam schools, it is common knowledge that Stuyvesant is the most difficult to get into (*i.e.*, has the highest SHSAT score cutoff), followed by Bronx Science, and Brooklyn Tech respectively. Given this well-established ordering, we may get a sense of how well informed SHSAT test takers are about the

[20] *e.g.*, by default, Google Maps will provide directions for the current time when a user requests a route.

admissions process given their preference rankings: it is, for instance, pointless to include Stuyvesant on one's preference list if Brooklyn Tech is placed first (since qualifying for Stuyvesant is more difficult, it is impossible to qualify for Stuyvesant but not Brooklyn Tech).

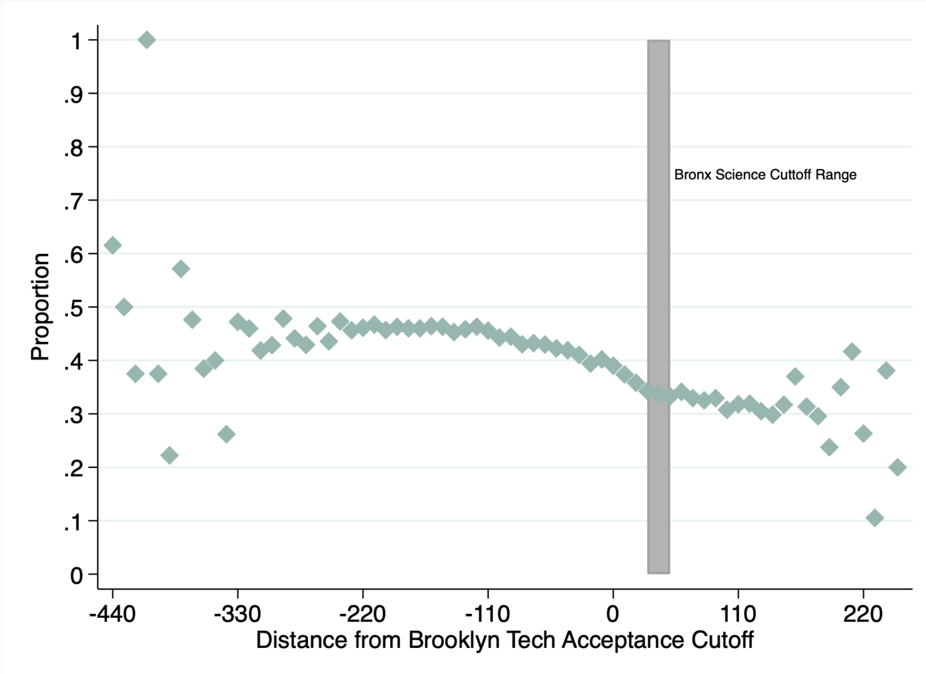
Indeed, as shown in Figures 2 and 3, we see that students who score higher on the SHSAT seem to better understand the admissions process: the proportion that list Stuyvesant as a second choice or lower falls as SHSAT scores increase and the proportion who rank Brooklyn Tech above Bronx Science follows the same pattern.

Figure 2: Students Who Rank Stuyvesant 2nd or Lower



This figure plots the proportion of students who rank Stuyvesant 2nd or lower for every ten point change in SHSAT score distance from the acceptance cutoff – e.g., the first point on the left is the proportion of students who 1) scored between 440 and 430 points below the cutoff and 2) ranked Stuyvesant but ranked it below another school.

Figure 3: Students Who Rank Brooklyn Tech above Bronx Science



This figure plots the proportion of students who rank Bronx Science below Brooklyn Tech for every ten point change in SHSAT score distance from the acceptance cutoff – e.g., the first point on the left is the proportion of students who 1) scored between 440 and 430 points below the cutoff and 2) ranked Bronx Science but ranked it below Brooklyn Tech.

Now, students apply to an exam school simply by including it on their preference lists when they take the SHSAT. Once a student has already decided to take the test, applying to any exam school entails no additional cost. It may very well be the case that a student who prefers Bronx Science includes Stuyvesant lower on his or her list simply to completely fill out the form, for no reason in particular. So it is not necessarily the case that every student who does this misunderstands the admissions process; but, if it were entirely random behavior, we should not expect such a striking relationship between the likelihood of doing so and test scores.

3.5 Geography of Applications

The maps in Figure 5 show the proportion of applicants who apply to each school. Before any analysis, we note some patterns in students' decisions. Those applying to Stuyvesant tend to be close by, or along subway lines providing relatively easy access (as in the case of Queens along the E and 7 lines). Notice how south Brooklyn has a high proportion of students choosing Stuyvesant relative to downtown Brooklyn near Brooklyn Tech. The students in South Brooklyn have a relatively long commute to both Brooklyn Tech and Stuyvesant; the ones downtown have a shorter commute to Stuyvesant, but even shorter still to Brooklyn Tech as they are within walking distance (or a short one-seat bus ride). Additionally, the Bronx has a higher proportion of students selecting Bronx Science first (the only relatively convenient exam school in that borough).

3.6 Exam High School Admissions

New York City's "regular" high schools use a version of the deferred acceptance algorithm to determine admissions. The specialized schools' admissions process runs parallel to this: traditionally, students admitted to a specialized school also receive an offer from a "regular" high school (which they typically decline). This may explain why a very high proportion of students list Brooklyn Tech somewhere on their preference lists as in Figure 1; they maintain the option to go there and do not lose the opportunity to attend a "regular" high school.

Exam school admissions could be viewed as its own deferred acceptance process where the high schools all have the same trivial preference ordering over students (they prefer students with higher SHSAT scores). Notably, reporting preferences truthfully is a dominant strategy for deferred acceptance, so students have no incentive to lie when they rank schools. Borrowing notation from Mennle and Seuken (2017), we describe this formally as a set N of n students; a set M of m schools; a set of student preference profiles $P = (P_1, ..., P_n) \in \mathcal{P}^N$; a set π of priority orders $\pi = (\pi_j)_{j \in M} \in \Pi^M$, where $\pi_j = \pi_{j'} \forall j, j' \in M$ since all schools only prioritize students over their SHSAT scores; an assignment matrix $(x_{i,j})_{i \in N, j \in M}$ where each element is the probability student i receives a seat in school j, $x_{i,j} \in \{0, 1\}$,[21] and where X is the set of all feasible assignments; and a mapping mechanism $\varphi : \Pi^M \times \mathcal{P}^N \to X$ that takes π and P as inputs then assigns students to schools.

In our case, the assignment mechanism φ follows a deferred acceptance process:

Round 1 Students are assigned to their first choice schools. The schools order the students from highest to lowest score, tentatively accept the highest ranked students until they hit capacity, then reject the rest.

Round 2 Rejected students from the first round apply to their second choice schools.[22] The schools now rank order their current tentatively accepted students and the new applicants by test score, tentatively accept the highest ranked students from this list until they hit capacity, then reject the rest.

Subsequent rounds This process repeats until no schools receive new applicants. The acceptance lists are finalized.

More intuitively, since the schools' preferences are rather trivial, we may equivalently think of the admissions process as follows:

Step 1 Rank order the students from highest SHSAT score to lowest.

Step 2 Assign the first-ranked student to his or her first ranked school.

Step 3 Assign the next student to his or her highest-ranked school, if it still has space. If not, assign to the second-ranked school. If there is not space in the second, assign to the third, *& c.*

And so on Repeat the prior step until all exam schools are full.

[21] The assignment is deterministic because it only depends on the test score.
[22] Automatically of course since the application is just a preference list the students fill out before the test.

4. Choice Model

We analyze several discrete choice models of school application decisions, which are described here.

4.1 Choice of Whether to Apply

Given the specialized high schools' admissions procedures, we can consider a student's choice of whether to include a school on his or her list as a binary yes or no decision.[23] Ranking Stuyvesant first is a "yes" for that school, anything else is a "no". Including Bronx Science on the list and ranking it above Brooklyn Tech is a "yes". Including Brooklyn Tech at all is a "yes". Thus, the decision of whether or not to apply to a given school suits a binomial logit specification. Multinomial logit is not necessary because the choice of whether to apply to a school (a binary outcome) is the object of interest; the school a student ultimately attends has multiple discrete potential outcomes, but that is not what we model here.

4.1.1 Baseline Model, Total Travel Time

We consider a student i's likelihood of applying to school j as a function of distance (measured by commuting time) to that school; distance to other exam schools (*i.e.*, the student's other options); whether the student's commute includes a bus, subway, or both; whether the commute includes transfers and what type (*e.g.* subway to subway, bus to subway); and control variables: year (equivalent to cohort in this context) fixed effects, race, sex, free/reduced lunch status, whether a student lives in a NYCHA property or not, median income of a student's Census tract. Specifically, for each student i and school $j \in \{S, BX, BK\} = \{Stuyvesant, Bronx\ Science, Brooklyn\ Tech\}$ the log likelihood function is

$$\mathcal{L}_i^j = \ln \frac{p_i^j}{1 - p_i^j}$$

$$\mathcal{L}_i^j = \alpha^j + \beta_1^j D_i^S + \beta_2^j D_i^{BX} + \beta_3^j D_i^{BK} + \sum_{k \in \{S,BX,BK\}} \left(\psi_k^j Transfers_i^k \right) + X_i' \theta^j + \epsilon_i^j \tag{1}$$

where D denotes the travel time to a school, the $Transfers$ variable counts the number of transfers required for a commute, the subway and bus indicators are 1 if a commute includes that travel mode, the walk indicator is 1 if a commute requires more than 15 minutes of walking, X_i is a vector of control variables, and ϵ is an error term.

[23] Listing one's true preference is a dominant strategy. See Sections 3.4 and 3.6. It is possible to apply to multiple locations at once. *e.g.*, a preference list of 1) Stuyvesant, 2) Bronx, 3) Brooklyn would count as applying to each of those. If a student had no interest in Stuyvesant, he or she could rank 1) Bronx, 2) Brooklyn, 3) none or 1) Bronx, 2) Brooklyn, 3) Stuyvesant; both of those are equivalent to applying to Bronx and Brooklyn but not Stuyvesant.

4.1.2 Total Travel Time with Transit Mode Fixed Effects

$$
\begin{aligned}
\mathcal{L}_i^j &= \alpha^j + \beta_1^j D_i^S + \beta_2^j D_i^{BX} + \beta_3^j D_i^{BK} + \sum_{k \in \{S, BX, BK\}} \left(\psi_k^j Transfers_i^k \right) \\
&+ \sum_{k \in \{S, BX, BK\}} \left(\delta_{1,k}^j 1\{Walk\ Only_i^k\} + \delta_{2,k}^j 1\{Bus_i^k\} + \delta_{3,k}^j 1\{Bus\ and\ Subway_i^k\} \right) \\
&+ X_i' \theta^j + \epsilon_i^j
\end{aligned} \tag{2}
$$

4.1.3 Travel Time by Transit Mode

We also evaluate a more detailed specification, where we regress application decisions on the amount of time required on each commuting mode:

$$
\begin{aligned}
\mathcal{L}_i^j &= \alpha^j + \sum_{k \in \{S, BX, BK\}} \left(\beta_{1,k}^j SubwayTime_i^k + \beta_{2,k}^j BusTime_i^k + \beta_{3,k}^j WalkTime_i^k \right) \\
&+ \sum_{k \in \{S, BX, BK\}} \left(\psi_k^j Transfers_i^k \right) \\
&+ \sum_{k \in \{S, BX, BK\}} \left(\delta_{1,k}^j 1\{Walk\ Only_i^k\} + \delta_{2,k}^j 1\{Bus_i^k\} + \delta_{3,k}^j 1\{Bus\ and\ Subway_i^k\} \right) \\
&+ X_i' \theta^j + \epsilon_i^j
\end{aligned} \tag{3}
$$

where we still include indicators for each transit mode to account for effects that are not time-dependent.[24] The index i indicates the individual student, j indicates the school being considered, and k indexes over all schools.[25] [26]

4.2 First Choice School

Alternatively, we may consider a student's first choice exams school as a choice among unordered alternatives. In this case, the decision is no longer binary, so we appeal to a multinomial logit specification. Rather than a regression for the binary choice of whether to apply to a particular school, we model the likelihood of ranking each school as a first choice.

The model is specified as:

[24] *e.g.*, this would capture whether students just dislike having to take a bus at all. In practice however, the coefficients are statistically indistinguishable from zero.

[25] k is just for notational convenience so we do not write out the same terms multiple times.

[26] So, for instance, $\beta_{1,BK}^S$ is the effect of subway commute time to Bronx Science on a student's decision of whether to apply to Stuyvesant; $SubwayTime_i^{BX}$ is student i's subway commute time to Bronx Science.

$$\mathcal{L}(j,i) = \alpha_0^j + \sum_{k\in\{S,BX,BK,O\}} \left(\beta_{1,k}^j D_i^k\right) + \sum_{k\in\{S,BX,BK\}} \left(\psi_k^j Transfers_i^k\right) + X_i'\theta^j + \epsilon_i^j \tag{4}$$

which is nearly the same as equation 1, except the regressand $\mathcal{L}(j,i)$ is the probability for individual i that a school j is chosen first out of the set of all exam schools rather than the probability for the binary choice of whether j is ranked at all. Additionally, note the "O" for "other" now in the school set $\{S, BX, BK, O\}$: this is the travel duration to the closest other exam high school (*i.e.*, not Stuyvesant, Bronx Science, or Brooklyn Tech) to the given student. Roughly 12% of students in our sample have a first choice school that is not one of three big/traditional exam schools.

5. Results

This section reports results from each of our model specifications. We then discuss findings on offer rejection, robustness, and a few miscellaneous points.

5.1 Travel Times (Baseline) and Commute Mode

Table 1 displays selected results for the baseline specification.[27] As expected, the probability of applying to a school is most affected by the student's travel time to that school. An eighth grader who lives 20 minutes away from Stuyvesant/Bronx Science/Brooklyn Tech is 74%/234%/137% more likely to apply than an equivalent eighth grader who lives 40 minutes away. Cross effects are small for Stuyvesant: holding the Stuyvesant commute time constant, students' likelihood of applying falls as they get closer to Bronx Science and Brooklyn Tech, but only marginally. Conversely, Bronx Science and Brooklyn Tech seem much more readily substitutable. Holding travel time to the Bronx fixed, a student 20 minutes away from Brooklyn is 79% less likely to apply to the Bronx than a student 40 minutes away from Brooklyn.

In our sample, as defined in Section 4.1, 41% of students apply to Stuyvesant, 42% apply to Bronx Science, and 85% apply to Brooklyn Tech. Among students who score at least 20 points below the Brooklyn Tech SHSAT score cutoff, these figures are 60%, 51%, and 87% respectively.

[27] For full results, see Table 8.

Table 1: Baseline Results

	Stuyvesant			Bronx			Brooklyn		
	(A)	(B)	(C)	(A)	(B)	(C)	(A)	(B)	(C)
Stuyvesant Travel Time	-1.655 (0.050)	+74%	1.7:1	-0.345 (0.065)	+12%	1.1:1	0.287 (0.067)	-9%	0.9:1
Bronx Travel Time	0.318 (0.020)	-10%	0.9:1	-3.616 (0.031)	+234%	3.3:1	1.286 (0.028)	-35%	0.7:1
Brooklyn Travel Time	0.312 (0.046)	-10%	0.9:1	4.626 (0.060)	-79%	0.2:1	-2.593 (0.063)	+137%	2.3:1
Stuyvesant Transfers	0.038 (0.008)	-4%	1:1	0.343 (0.011)	-34%	0.7:1	-0.201 (0.010)	+18%	1.2:1
Bronx Transfers	0.105 (0.009)	-10%	0.9:1	0.268 (0.013)	-24%	0.8:1	-0.181 (0.013)	+20%	1.2:1
Brooklyn Transfers	0.064 (0.009)	-7%	0.9:1	0.182 (0.012)	-17%	0.8:1	0.036 (0.011)	-4%	1:1

(A) Coefficient and (Standard Error). All listed estimates are significant at $p < 0.01$.
(B) for travel times: percentage difference in likelihood for a student 20 minutes away relative to one 40 minutes away, all else equal
(B) for transfers: percentage difference in likelihood for a student with a no transfer commute relative to a student with a one transfer commute, all else equal
(C) for travel times: odds a student 20 minutes away applies relative to odds of a student 40 minutes away, all else equal
(C) for transfers: odds a student with a no transfer commute applies relative to odds of a student with a one transfer commute, all else equal

There are some salient similarities in both the baseline and subsequent specifications. First, travel time matters a lot. It is less important when students consider applying to the best school in the state than when merely deciding whether to apply to a school in the top ten, but even at Stuyvesant, a long commute is a deterrent. Second, for top schools (Bronx, Brooklyn) but not the very best one (Stuyvesant), there is a high degree of substitutability based on commute time. Third, transfers are statistically significant but do not tend to tell a consistent story, and effect sizes are relatively modest. An interpretation is that transfers do not matter much, aside from the additional commuting time they require.

To put the likelihood of an application in perspective, consider a student as we move her around the city.[28] The map in Figure 4 depicts each point we evaluate for this example. Table 2 lists the odds ratio that the student applies at each point and the odds that she applies relative to her theoretical twin on the Upper West Side (point F on the map). Note that the student is three times more likely to apply to Stuyvesant if she lives on the Upper West Side (a relatively quick one-subway ride away) as opposed to near the city line in the Bronx. See Table 6 for a description of each location.

[28] Our reference will be a female Asian who scores exactly at the Brooklyn Tech SHSAT cutoff in 2012 who has qualified for free/reduced price lunch at some point during her time in public school.

Figure 4: Example Map

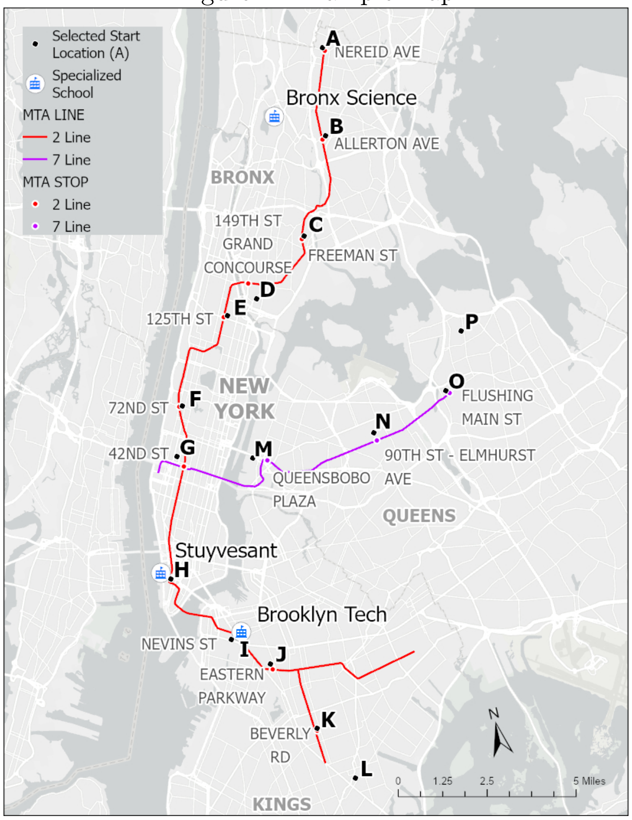


Table 2: Application Odds by Location

Label	Stuyvesant (A)	Stuyvesant (B)	Bronx (A)	Bronx (B)	Brooklyn (A)	Brooklyn (B)
A	0.7:1	0.3:1	655.2:1	128.9:1	0.7:1	0.1:1
B	0.9:1	0.4:1	68.6:1	13.5:1	1.7:1	0.3:1
C	1.3:1	0.6:1	28.1:1	5.5:1	2.5:1	0.5:1
D	1.3:1	0.6:1	9.7:1	1.9:1	5:1	0.9:1
E	1.6:1	0.7:1	7.5:1	1.5:1	5.3:1	0.9:1
F	2.3:1	1:1	5.1:1	1:1	5.6:1	1:1
G	2.3:1	1:1	1.6:1	0.3:1	9.4:1	1.7:1
H	3.6:1	1.6:1	0.3:1	0.1:1	21.4:1	3.8:1
I	2.3:1	1:1	0.1:1	0:1	36.9:1	6.6:1
J	2:1	0.9:1	0.1:1	0:1	28.6:1	5.1:1
K	2.1:1	0.9:1	0.2:1	0:1	21.8:1	3.9:1
L	1.7:1	0.7:1	0.2:1	0:1	16.2:1	2.9:1
M	1.7:1	0.7:1	1.3:1	0.3:1	9.3:1	1.7:1
N	1.7:1	0.8:1	1.5:1	0.3:1	8.8:1	1.6:1
O	1.6:1	0.7:1	1.6:1	0.3:1	7.8:1	1.4:1
P	1.4:1	0.6:1	21.9:1	4.3:1	2.5:1	0.5:1

(A) Odds, to one decimal point, the hypothetical student applies
(B) Odds the hypothetical student applies relative to an identical student living at point F

Turning to Table 7 we report results for a regression that includes the baseline variables as well as indicators for commute mode.[29] For the commute dummies, the base case is the subway, which constitutes the lion's share. The other options are walk-only, bus-only, and commutes that include a bus and a subway ride.[30] These indicators are statistically significant but, for the most part, do not seem to pick up a consistent relationship. Notably, students with walking-only or bus-only commutes to Bronx Science are quite a bit less likely to apply to Stuyvesant. This gets at a substitution effect between the two schools: anyone close enough to Bronx Science to walk there faces an approximately hour-long commute to Stuyvesant.[31]

5.2 Relative Travel Times

Here we regress whether or not a student applies to a particular school on the travel time to that school as well as the relative travel time to alternatives. This specification is very similar to the one in Table 1 but allows a different interpretation. The baseline specification's coefficients explain how application likelihood

[29] For the full regression output, see Table 8.

[30] By necessity, we trust Google's mapping results to some extent here. Roughly, this means we use the quickest commute. Of course, some students may opt for a 30 minute walk over a 15 minute subway trip (one of the authors faced that trade-off and based the decision on the weather), but we have no way to incorporate that.

[31] Thus, commute times and commute modes are at least to some extent colinear. But statistical tests show that this collinearity does not seem severe enough to pose a serious threat to our model; see Table 5.

changes in travel duration while holding other travel times constant. In practice, it is quite difficult to move, say, farther away from Bronx Science without also changing one's commute time to Brooklyn Tech. So, in this setup, we consider the travel time to a school as well the difference between that time and the time to alternative schools.

Table 3 presents the results.[32] The own school effects are still quite strong and are the predominant factor for Stuyvesant. However, note that this drives home how substitutable Bronx Science and Brooklyn Tech are. For example, a student who has a 20 minute longer travel time to Brooklyn than to the Bronx has 133:1 odds of applying to the Bronx relative to a student for whom this travel difference is 40 minutes.

Table 3: Relative Distance Results

	Stuyvesant			Bronx			Brooklyn		
	(A)	(B)	(C)	(A)	(B)	(C)	(A)	(B)	(C)
Stuyvesant Travel Time	-0.81 (0.038)	31%	1.3:1						
Stuyvesant Less Bronx Travel Time	-0.129 (0.023)	4%	1:1						
Stuyvesant Less Brooklyn Travel Time	-0.316 (0.049)	11%	1.1:1						
Bronx Less Stuyvesant Travel Time				0.797 (0.071)	-55%	0.5:1			
Bronx Science Travel Time				0.64 (0.049)	-47%	0.5:1			
Bronx Less Brooklyn Travel Time				-4.89 (0.065)	13195%	133:1			
Brooklyn Less Stuyvesant Travel Time							-0.496 (0.072)	64%	1.6:1
Brooklyn Less Bronx Travel Time							-1.181 (0.031)	226%	3.3:1
Brooklyn Tech Travel Time							-0.862 (0.055)	137%	2.4:1
Stuyvesant Transfers	0.073 (0.009)	-7%	0.9:1	0.366 (0.012)	-31%	0.7:1	-0.179 (0.012)	20%	1.2:1
Bronx Science Transfers	0.124 (0.011)	-12%	0.9:1	0.371 (0.016)	-31%	0.7:1	-0.185 (0.016)	20%	1.2:1
Brooklyn Tech Transfers	0.062 (0.01)	-6%	0.9:1	0.101 (0.013)	-10%	0.9:1	0.09 (0.012)	-9%	0.9:1

(A) Coefficient and (Standard Error). All listed estimates are significant at $p < 0.01$.
(B) for travel times: percentage difference in likelihood for a student 20 minutes away relative to one 40 minutes away, all else equal
(B) for transfers: percentage difference in likelihood for a student with a no transfer commute relative to a student with a one transfer commute, all else equal
(C) for travel times: odds a student 20 minutes away applies relative to odds of a student 40 minutes away, all else equal
(C) for transfers: odds a student with a no transfer commute applies relative to odds of a student with a one transfer commute, all else equal
An empty cell indicates estimates do not apply to the given specification.

We do not have an answer for why Stuyvesant is apparently less substitutable. Perhaps it is an anchoring effect due to the school being regarded as the best. Whatever the case, it does not seem related to outcome differences between the schools: as mentioned in the introduction, the quality difference between them is not vast (top 1% – Brooklyn Tech – up to the best – Stuyvesant). Moreover, Dobbie and Fryer (2014) find

[32] For the full regression specification see Table 9.

no effect on outcomes that is not already explained by students' SHSAT scores. Though not a focus of this paper, there is nothing in our dataset that contradicts their findings.[33]

5.3 First Choice School

Table 4 describes the results of the specification in equation 4.[34] Generally, the finding are similar to the baseline model. Travel duration is a significant factor (though less important for Stuyvesant than the others) and Bronx Science and Brooklyn Tech emerge as relatively substitutable.

In our sample 41% of students select Stuyvesant as their first choice, 20% choose Bronx Science, 28% choose Brooklyn Tech, and 12% choose one of the others. Among students who score 20 points below the Brooklyn Tech cutoff or higher, these figures are 60% Stuyvesant, 18% Bronx, 15% Brooklyn, and 7% other.

Table 4: First Choice Results

	Stuyvesant			Bronx			Brooklyn		
	(A)	(B)	(C)	(A)	(B)	(C)	(A)	(B)	(C)
Stuyvesant Travel Time	-1.295 (0.078)	54%	1.5:1	-0.35 (0.091)	12%	1.1:1	-0.936 (0.086)	37%	1.4:1
Bronx Travel Time	-0.087 (0.033)	3%	1:1	-2.24 (0.039)	111%	2.1:1	2.219 (0.041)	-52%	0.5:1
Brooklyn Travel Time	0.055 (0.07)	-2%	1:1	2.741 (0.085)	-60%	0.4:1	-2.79 (0.078)	153%	2.5:1
Stuyvesant Transfers	-0.111 (0.013)	12%	1.1:1	0.172 (0.015)	-16%	0.8:1	-0.204 (0.014)	23%	1.2:1
Bronx Transfers	-0.263 (0.015)	30%	1.3:1	-0.268 (0.018)	31%	1.3:1	-0.406 (0.016)	50%	1.5:1
Brooklyn Transfers	0.181 (0.014)	-17%	0.8:1	0.277 (0.016)	-24%	0.8:1	0.093 (0.016)	-9%	0.9:1

(A) Coefficient and (Standard Error). All listed estimates are significant at $p < 0.01$.
(B) for travel times: percentage difference in likelihood for a student 20 minutes away relative to one 40 minutes away, all else equal
(B) for transfers: percentage difference in likelihood for a student with a no transfer commute relative to a student with a one transfer commute, all else equal
(C) for travel times: odds a student 20 minutes away applies relative to odds of a student 40 minutes away, all else equal
(C) for transfers: odds a student with a no transfer commute applies relative to odds of a student with a one transfer commute, all else equal

5.4 Offer Rejection

In our sample, 6,877 students receive admissions offers to Stuyvesant; of these, 683 reject the offer. For Bronx Science, 8,019 are offered admission, and 2,013 of these reject. At Brooklyn Tech, there are 13,928 offers, 3,902 of which are rejected. As a coda to our main results, we ask how much commuting time factors into student's decisions of whether to matriculate or reject an exam school offer. We find that the commute does seem to matter a lot for students who reject Brooklyn Tech offers (59% of the total rejections) but is not a statistically significant factor for students rejecting Stuyvesant or Bronx Science offers. For results see

[33]This includes when we restrict the sample by demographics (*e.g.*, by race or by students living in New York Housing Authority properties). The only discontinuity we see is that students who just make it into an exam school are somewhat more likely to take the physics Regents Exam.

[34]For the full regression results see Table 11.

Table 13.

Interestingly, students who reject admissions offers are not observably of lower ability (as we might expect in such a self-selected group). Conditional on SHSAT scores, they perform as well as their peers on the SAT and regents exams. However, they are potentially less motivated: they are less likely to take the SAT and tend to sit for fewer regents tests.

As for why rejections occur at all, recall from Section 3.6 that students who qualify for an exam school still receive a second offer through the regular admissions process (to a local high school for instance). So, while most admitted students accept their exam school offers, some reevaluate and decline.

5.5 Robustness

We include results for a linear probability model in Table 12. We view logit as a much more appropriate specification, but it is heartening that the implications of a linear model do not radically depart from our findings. The likelihood of applying to Stuyvesant declines by about 11% for every 20 minutes of commute time, 15% for Bronx Science, and 10% for Brooklyn Tech. The main difference from the baseline specification is that Brooklyn Tech applications seem a bit less sensitive to commute times.

Importantly, a linear specification allows us to examine variance inflation factors (VIF). These are reported in Table 5 Generally, they are reasonable, allowing for the fact that travel times between schools are necessarily related to some extent (*e.g.*, it's difficult to move farther away from Bronx Science without getting closer to Brooklyn Tech). This test does explain why we do not include county level fixed effects as those are quite collinear with travel times. This is to be expected since a fixed effect by a general location will naturally proxy for a specific location.[35]

5.6 Other Findings

There are a few notable relationships between demographic variables and likelihood of applying to exam schools as shown in Table 8. Male students seem to aim a bit lower, being more likely to apply to Brooklyn Tech but less likely to apply to the higher ranked exam schools. Asians are significantly more likely than others to apply across the board.[36] Indicators for whether students have ever received free/reduced price lunch (these make up a majority of the sample) and whether students live in NYCHA public housing (a rather small portion of the sample) do not seem related to application likelihood in a consistent fashion.

6. Conclusion

School choice has been a contested policy topic for some time, and the optimal way to match students to schools has generated more than a few academic papers. But, a more foundational matter is not well understood: Even with all the choice in the world, are students willing to travel enough for it to matter?

This paper gets at the question of how willing students are to travel by looking at a subset of high achieving students (or at least those motivated enough to take an extra test), applying to highly selective schools, who have access to an extensive public transit system to reach said schools. So, we ought to think of them on

[35] As a thought exercise, if we take this to an extreme, Census block level fixed effects would perfectly covary with travel times.

[36] Though we do not investigate why, sample selection would seem a plausible explanation since a much higher percentage of Asians in NYC are immigrants than other ethnic groups.

being on the high end of willingness/ability to commute. Still, we find that their likelihood of applying to the best schools in the state falls off dramatically as commuting time increases. We should not conclude that school choice is unimportant; after all, our dataset is made up entirely of students applying to schools they would prefer over a traditional high school. But, school choice would seem a poor substitute for having schools close to where one lives.

A useful topic of future research would be to determine how much potential school choice is available in different areas. If every city had an application-based high school system like New York's, how many options might a typical student have within a reasonable commuting distance? What is a reasonable commuting distance for teenagers who cannot drive and who, as is the case across much of the US, have no access to public transportation? Importantly, it would be useful to know if school choice is capitalized into housing values. Are neighborhoods with reasonable access to alternative schools valued more highly than those with only one option?

References

[1] Abdulkadiroğlu, Atila, Joshua Angrist, and Parag Pathak. 2014. "The Elite Illusion: Achievement Effects at Boston and New York Exam Schools." Econometrica, 82(1): 137-196.

[2] Barbanchon, Thomas Le, Roland Rathelot, and Alexandra Roulet. 2021. "Gender Differences in Job Search: Trading off Commute against Wage." The Quarterly Journal of Economics, 136(1): 381-426.

[3] Cheety, Raj and Nathaniel Hendren. 2018a. "The Effects of Neighborhoods on Intergenerational Mobility I: Childhood Exposure Effects." The Quarterly Journal of Economics, 133(3): 1107-1162.

[4] Cheety, Raj and Nathaniel Hendren. 2018b. "The Effects of Neighborhoods on Intergenerational Mobility II: County Level Estimates." The Quarterly Journal of Economics, 133(3): 1163-1228.

[5] Corcoran, Sean. 2018. "School Choice and Commuting: How Far New York City Students Travel to School." Urban Institute Research Report.

[6] Cordes, Sarah, Amy Schwartz, and Leanna Stiefel. 2017. "Moving Matters: The Causal Effect of Moving Schools on Student Performance." Education Finance and Policy, 12(45): 419-446.

[7] Cordes, Sarah, Amy Schwartz, and Leanna Stiefel. 2019. "The Effect of Residential Mobility on Student Performance: Evidence from New York City." American Educational Research Journal, 56(4): 1380-1411.

[8] Dobbie, Will and Roland Fryer. 2014. "The Impact of Attending a School with High-Achieving Peers: Evidence from the New York City Exam Schools." American Economic Journal: Applied Economics, 6(3): 58-75.

[9] Griffith, Amanda and Kevin Rask. 2014. "Peer Effects in Higher Education: A Look at Heterogeneous Impacts." Economics of Education Review, 39: 65-77.

[10] Krueger, Alan B and Andreas Mueller. 2016. "A Contribution to the Empirics of Reservation Wages." American Economic Journal: Economic Policy, 8(1): 142-179.

[11] Laliberté, Jean-William. 2021. "Long-Term Contextual Effects in Education: Schools and Neighborhoods." American Economic Journal: Economic Policy, 13(2): 336-377.

[12] Mayock, Tom and Kelly Vosters. 2022. "Rental Housing, Housing Sorting, and Academic Achievement." Working Paper, SSRN: *https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4035012*

[13] McFadden, David. 1974. "The Measurement of Urban Travel Demand." Journal of Public Economics, 3(4): 303-328.

[14] Mennle, Timo and Sven Seuken. 2017. "Trade-offs in School Choice: Comparing Deferred Acceptance, the Classic, and the Adaptive Boston Mechanism." Working Paper, arXiv: *https://arxiv.org/abs/1406.3327*

[15] Shure, Nikki. 2021. "Non-cognitive Peer Effects in Secondary Education." Labour Economics, 73: 102074.

[16] Trajkovski, Samantha, Jeffrey Zabel, and Amy Ellen Schwartz. 2021. "Do School Busses Make School Choice Work?" Regional Science and Urban Economics, 86: 103607.

[17] Zimmerman, David. 2003. "Peer Effects in Academic Outcomes: Evidence from a Natural Experiment." The Review of Economics and Statistics, 85(1): 9-23.

A Appendix

1.1 Variance Inflation Factors

Table 5: Results Including Commute Mode

	(A)	(B)	(C)
Stuyvesant Travel Time	5.32	6.27	6.67
Bronx Science Travel Time	2.54	3.23	5.21
Brooklyn Tech Travel Time	5.96	6.68	7.86
Stuyvesant Transfers	1.60	2.02	1.76
Bronx Science Transfers	1.59	2.19	1.84
Brooklyn Tech Transfers	1.54	1.78	1.57
Distance from SHSAT cutoff	1.33	1.33	1.34
Log of Tract Median Household Income	1.45	1.47	1.50
Male	1.00	1.00	1.00
Black	1.62	1.78	1.74
Hispanic	1.62	1.67	1.64
White	1.42	1.44	1.47
In Public Housing	1.15	1.17	1.18
Received Free Lunch	1.28	1.28	1.29
8th Grade Year=2006	1.80	1.80	1.80
8th Grade Year=2007	1.90	1.90	1.90
8th Grade Year=2008	1.96	1.96	1.96
8th Grade Year=2009	1.96	1.96	1.96
8th Grade Year=2010	1.99	1.99	1.99
8th Grade Year=2011	1.95	1.95	1.95
8th Grade Year=2012	1.90	1.90	1.90
8th Grade Year=2013	1.92	1.92	1.92
8th Grade Year=2014	1.89	1.89	1.89
Walk Only		1.07	
Bus		1.03	
Bus and Subway		2.45	
Walk Only		1.19	
Bus		1.66	
Bus and Subway		2.39	
Walk Only		1.05	
Bus		1.27	
Bus and Subway		2.21	
Brooklyn			13.14
Manhattan			3.50
Queens			9.38

(A) Baseline specification
(B) With commute mode
(C) With county fixed effects

1.2 Background Information

Table 6: Description of Mapped Points

Label	Cross-Streets	Nearest Subway Stop on 2 or 7 Lines	Nearby Subway Lines
A	Nereid Ave between Matilda Ave and Richardson Ave	Nereid Ave	2; 5
B	Allerton Ave between Holland Ave and Wallace Ave	Allerton Ave	2; 5
C	Freeman St between Hoe Ave and Vyse Ave	Freeman St	2; 5
D	E 140th between 3rd Ave and Alexander	149th St Grand Concourse	2; 4; 5
E	126th St between Lenox and 5th	125th St	2; 3
F	72nd St Between Columbus and Amsterdam	72nd St	2; 1; 3; B; C
G	45th St between 8th and 9th	42nd St	2; 1; 3; A; C; E; 7; N; Q; R; W
H	Warren between W Broadway and Church	Chambers St	2; 1; 3; A; C; E
I	Atlantic Ave between Nevins and Bond	Nevins St	2; 3; 4; 5; A; C; G; B; D; N; Q; R
J	St John's Place between Underhill and Washington	Eastern Parkway	2; 3; B; Q; 4; 5
K	Beverly Rd between E 31st St and E 32nd St	Beverly Rd	2; 5
L	Avenue L between Troy Ave and E 45th St	N/A	N/A
M	43th Ave between 10th St and 11th St	Queensboro Plaza	7; N; W; E; M; F; R; G
N	37th Ave between 89th St and 90th St	90th St - Elmhurst Ave	7
O	38th Ave between Prince St and Main St	Flushing Main St	7
P	20th Ave between 149th St and 150th St	N/A	N/A

1.3 Alternate Regression Specifications

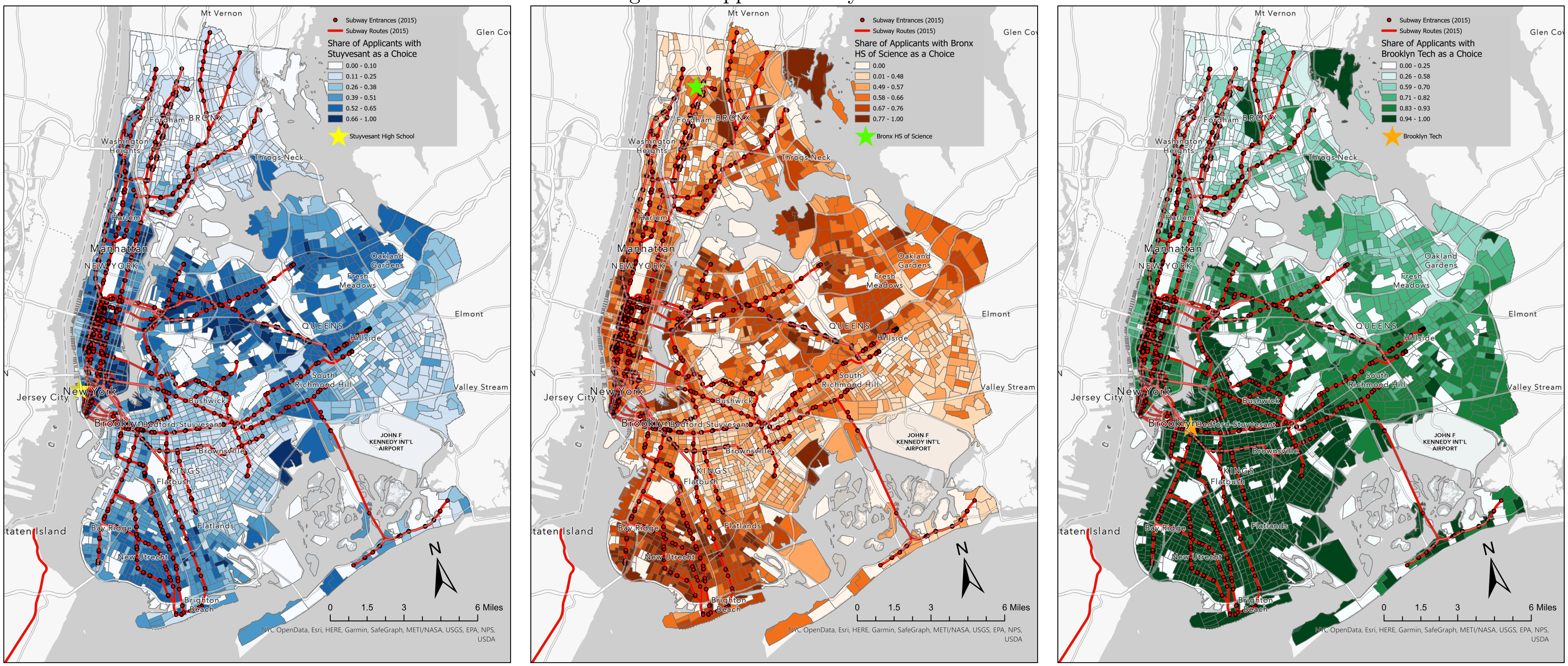
Table 7: Results Including Commute Mode

	Stuyvesant			Bronx			Brooklyn		
	(A)	(B)	(C)	(A)	(B)	(C)	(A)	(B)	(C)
Stuyvesant Travel Time	-1.255 (0.055)	52%	1.5:1	-0.797 (0.071)	30%	1.3:1	0.496 (0.072)	-15%	0.8:1
Bronx Travel Time	0.129 (0.023)	-4%	1:1	-3.453 (0.034)	216%	3.2:1	1.181 (0.031)	-33%	0.7:1
Brooklyn Travel Time	0.316 (0.049)	-10%	0.9:1	4.89 (0.065)	-80%	0.2:1	-2.54 (0.066)	133%	2.3:1
Stuyvesant Transfers	0.073 (0.009)	-7%	0.9:1	0.366 (0.012)	-31%	0.7:1	-0.179 (0.012)	20%	1.2:1
Bronx Transfers	0.124 (0.011)	-12%	0.9:1	0.371 (0.016)	-31%	0.7:1	-0.185 (0.016)	20%	1.2:1
Brooklyn Transfers	0.062 (0.01)	-6%	0.9:1	0.101 (0.013)	-10%	0.9:1	0.09 (0.012)	-9%	0.9:1
Walk Stuy	0.401 (0.066)	-33%	0.7:1	0.692 (0.063)	-50%	0.5:1			
Bus Stuy									
Bus and Subway Stuy	-0.059 (0.02)	6%	1.1:1	-0.231 (0.026)	26%	1.3:1			
Walk Bronx	-1.185 (0.068)	227%	3.3:1	-0.349 (0.113)	42%	1.4:1	0.063 (0.049)	-6%	0.9:1
Bus Bronx	-0.749 (0.033)	111%	2.1:1	0.265 (0.053)	-23%	0.8:1	0.106 (0.031)	-10%	0.9:1
Bus and Subway Bronx	-0.191 (0.018)	21%	1.2:1	-0.196 (0.025)	22%	1.2:1			
Walk Brook	-0.323 (0.072)	38%	1.4:1	0.612 (0.125)	-46%	0.5:1	0.83 (0.254)	-56%	0.4:1
Bus Brook	-0.169 (0.018)	18%	1.2:1	-0.711 (0.029)	104%	2:1	0.923 (0.042)	-60%	0.4:1
Bus and Subway Brook	-0.076 (0.02)	8%	1.1:1	0.54 (0.024)	-42%	0.6:1	-0.366 (0.026)	44%	1.4:1

(A) Coefficient and (Standard Error). All listed estimates are significant at $p < 0.01$.
(B) for travel times: percentage difference in likelihood for a student 20 minutes away relative to one 40 minutes away, all else equal
(B) for transfers: percentage difference in likelihood for a student with a no transfer commute relative to a student with a one transfer commute, all else equal
(B) for commute modes: percentage difference in likelihood for a student with a subway only commute relative to a student with a walk only/bus only/bus and subway commute, all else equal
(C) for travel times: odds a student 20 minutes away applies relative to odds of a student 40 minutes away, all else equal
(C) for transfers: odds a student with a no transfer commute applies relative to odds of a student with a one transfer commute, all else equal
(C) for commute modes: odds a student with a subway only commute applies relative to a student with a walk only/bus only/bus and subway commute, all else equal
An empty cell indicates an estimate is not statistically significant.

1.4 Maps

Figure 5: Applications by Location



1.5 Full Regression Results

Table 8: Baseline Model Results

	(1) Stuy	(2) Bronx	(3) Brook	(4) Stuy	(5) Bronx	(6) Brook
main						
Stuyvesant Travel Time	-1.655 (0.0504)	-0.346 (0.0647)	0.287 (0.0667)	-1.255 (0.0548)	-0.797 (0.0707)	0.496 (0.0715)
Bronx Science Travel Time	0.319 (0.0208)	-3.616 (0.0310)	1.186 (0.0276)	0.129 (0.0233)	-3.453 (0.0339)	1.181 (0.0306)
Brooklyn Tech Travel Time	0.312 (0.0461)	4.626 (0.0602)	-2.593 (0.0631)	0.316 (0.0491)	4.890 (0.0653)	-2.540 (0.0658)
Stuyvesant Transfers	0.0385 (0.00806)	0.343 (0.0108)	-0.202 (0.0107)	0.0726 (0.00903)	0.366 (0.0123)	-0.179 (0.0121)
Bronx Science Transfers	0.105 (0.00922)	0.268 (0.0130)	-0.181 (0.0131)	0.124 (0.0108)	0.371 (0.0158)	-0.185 (0.0158)
Brooklyn Tech Transfers	0.0639 (0.00926)	0.182 (0.0122)	0.0368 (0.0116)	0.0615 (0.00989)	0.101 (0.0130)	0.0899 (0.0123)
Distance from SHSAT cutoff	0.00558 (0.0000672)	0.00389 (0.0000846)	0.000557 (0.0000938)	0.00556 (0.0000675)	0.00384 (0.0000851)	0.000670 (0.0000940)
Log of Tract Median Household Income	-0.0398 (0.0123)	0.382 (0.0167)	-0.170 (0.0169)	-0.0179 (0.0125)	0.357 (0.0170)	-0.146 (0.0170)
Male	-0.217 (0.0105)	-0.268 (0.0137)	0.334 (0.0148)	-0.218 (0.0105)	-0.271 (0.0138)	0.334 (0.0149)
Black	-0.989 (0.0148)	-0.708 (0.0202)	0.0349 (0.0232)	-0.878 (0.0155)	-0.570 (0.0211)	-0.0721 (0.0237)
Hispanic	-0.512 (0.0151)	-0.572 (0.0198)	-0.622 (0.0214)	-0.482 (0.0153)	-0.453 (0.0201)	-0.686 (0.0217)
White	-0.607 (0.0171)	-0.588 (0.0218)	-0.171 (0.0260)	-0.595 (0.0172)	-0.472 (0.0221)	-0.236 (0.0263)
In Public Housing	0.197 (0.0269)	0.295 (0.0364)	-0.274 (0.0382)	0.211 (0.0271)	0.238 (0.0372)	-0.217 (0.0384)
Recieved Free Lunch	0.254 (0.0171)	-0.435 (0.0212)	0.261 (0.0234)	0.246 (0.0172)	-0.407 (0.0215)	0.224 (0.0236)
8th Grade Year=2006	0.0134 (0.0243)	-0.115 (0.0326)	-0.154 (0.0365)	0.0136 (0.0244)	-0.118 (0.0329)	-0.154 (0.0365)
8th Grade Year=2007	-0.134 (0.0236)	-0.105 (0.0315)	-0.298 (0.0348)	-0.133 (0.0237)	-0.107 (0.0318)	-0.302 (0.0349)
8th Grade Year=2008	-0.185 (0.0232)	-0.0435 (0.0310)	-0.354 (0.0340)	-0.186 (0.0233)	-0.0503 (0.0313)	-0.355 (0.0341)
8th Grade Year=2009	-0.253 (0.0233)	-0.100 (0.0310)	-0.278 (0.0344)	-0.256 (0.0234)	-0.107 (0.0313)	-0.280 (0.0344)
8th Grade Year=2010	-0.346 (0.0232)	-0.0409 (0.0308)	-0.318 (0.0340)	-0.353 (0.0233)	-0.0402 (0.0311)	-0.323 (0.0341)
8th Grade Year=2011	-0.459 (0.0236)	-0.0931 (0.0311)	-0.275 (0.0344)	-0.467 (0.0236)	-0.0969 (0.0314)	-0.278 (0.0345)
8th Grade Year=2012	-0.576 (0.0240)	-0.0643 (0.0315)	-0.339 (0.0347)	-0.587 (0.0241)	-0.0691 (0.0318)	-0.342 (0.0348)
8th Grade Year=2013	-0.697 (0.0241)	-0.0424 (0.0312)	-0.128 (0.0355)	-0.708 (0.0241)	-0.0435 (0.0315)	-0.133 (0.0356)
8th Grade Year=2014	-0.901 (0.0247)	-0.111 (0.0316)	-0.0802 (0.0360)	-0.912 (0.0248)	-0.121 (0.0318)	-0.0835 (0.0361)
Walk Only				0.401 (0.0661)	0.692 (0.0633)	-0.0511 (0.125)
Bus				0.280 (0.159)	0.0863 (0.141)	0.130 (0.263)
Bus and Train				-0.0592 (0.0195)	-0.231 (0.0256)	0.00669 (0.0266)
Walk Only				-1.185 (0.0675)	-0.349 (0.113)	0.0632 (0.0493)
Bus				-0.749 (0.0333)	0.265 (0.0529)	0.106 (0.0307)
Bus and Train				-0.191 (0.0181)	-0.196 (0.0249)	0.0368 (0.0241)
Walk Only				-0.323 (0.0723)	0.612 (0.125)	0.830 (0.254)
Bus				-0.169 (0.0178)	-0.711 (0.0286)	0.923 (0.0423)
Bus and Train				-0.0764 (0.0195)	0.540 (0.0238)	-0.366 (0.0258)
Constant	1.802 (0.136)	-2.554 (0.183)	4.575 (0.187)	1.524 (0.139)	-2.432 (0.188)	4.127 (0.189)
Observations	175739	175739	175739	175739	175739	175739
Pseudo R^2	0.104	0.428	0.173	0.108	0.436	0.180

Standard errors in parentheses

Table 9: Results for Relative Trip Times

	(1) Stuy	(2) Bronx	(3) Brook	(4) Stuy	(5) Bronx	(6) Brook
main						
Stuyvesant Travel Time	-1.025 (0.0348)			-0.810 (0.0375)		
Stuyvesant Less Bronx Travel Time	-0.319 (0.0208)			-0.129 (0.0233)		
Stuyvesant Less Brooklyn Travel Time	-0.312 (0.0461)			-0.316 (0.0491)		
Stuyvesant Transfers	0.0385 (0.00806)	0.343 (0.0108)	-0.202 (0.0107)	0.0726 (0.00903)	0.366 (0.0123)	-0.179 (0.0121)
Bronx Science Transfers	0.105 (0.00922)	0.268 (0.0130)	-0.181 (0.0131)	0.124 (0.0108)	0.371 (0.0158)	-0.185 (0.0158)
Brooklyn Tech Transfers	0.0639 (0.00926)	0.182 (0.0122)	0.0368 (0.0116)	0.0615 (0.00989)	0.101 (0.0130)	0.0899 (0.0123)
Distance from SHSAT cutoff	0.00558 (0.0000672)	0.00389 (0.0000846)	0.000557 (0.0000938)	0.00556 (0.0000675)	0.00384 (0.0000851)	0.000670 (0.0000940)
Log of Tract Median Household Income	-0.0398 (0.0123)	0.382 (0.0167)	-0.170 (0.0169)	-0.0179 (0.0125)	0.357 (0.0170)	-0.146 (0.0170)
Male	-0.217 (0.0105)	-0.268 (0.0137)	0.334 (0.0148)	-0.218 (0.0105)	-0.271 (0.0138)	0.334 (0.0149)
Black	-0.989 (0.0148)	-0.708 (0.0202)	0.0349 (0.0232)	-0.878 (0.0155)	-0.570 (0.0211)	-0.0721 (0.0237)
Hispanic	-0.512 (0.0151)	-0.572 (0.0198)	-0.622 (0.0214)	-0.482 (0.0153)	-0.453 (0.0201)	-0.686 (0.0217)
White	-0.607 (0.0171)	-0.588 (0.0218)	-0.171 (0.0260)	-0.595 (0.0172)	-0.472 (0.0221)	-0.236 (0.0263)
In Public Housing	0.197 (0.0269)	0.295 (0.0364)	-0.274 (0.0382)	0.211 (0.0271)	0.238 (0.0372)	-0.217 (0.0384)
Recieved Free Lunch	0.254 (0.0171)	-0.435 (0.0212)	0.261 (0.0234)	0.246 (0.0172)	-0.407 (0.0215)	0.224 (0.0236)
8th Grade Year=2006	0.0134 (0.0243)	-0.115 (0.0326)	-0.154 (0.0365)	0.0136 (0.0244)	-0.118 (0.0329)	-0.154 (0.0365)
8th Grade Year=2007	-0.134 (0.0236)	-0.105 (0.0315)	-0.298 (0.0348)	-0.133 (0.0237)	-0.107 (0.0318)	-0.302 (0.0349)
8th Grade Year=2008	-0.185 (0.0232)	-0.0435 (0.0310)	-0.354 (0.0340)	-0.186 (0.0233)	-0.0503 (0.0313)	-0.355 (0.0341)
8th Grade Year=2009	-0.253 (0.0233)	-0.100 (0.0310)	-0.278 (0.0344)	-0.256 (0.0234)	-0.107 (0.0313)	-0.280 (0.0344)
8th Grade Year=2010	-0.346 (0.0232)	-0.0409 (0.0308)	-0.318 (0.0340)	-0.353 (0.0233)	-0.0402 (0.0311)	-0.323 (0.0341)
8th Grade Year=2011	-0.459 (0.0236)	-0.0931 (0.0311)	-0.275 (0.0344)	-0.467 (0.0236)	-0.0969 (0.0314)	-0.278 (0.0345)
8th Grade Year=2012	-0.576 (0.0240)	-0.0643 (0.0315)	-0.339 (0.0347)	-0.587 (0.0241)	-0.0691 (0.0318)	-0.342 (0.0348)
8th Grade Year=2013	-0.697 (0.0241)	-0.0424 (0.0312)	-0.128 (0.0355)	-0.708 (0.0241)	-0.0435 (0.0315)	-0.133 (0.0356)
8th Grade Year=2014	-0.901 (0.0247)	-0.111 (0.0316)	-0.0802 (0.0360)	-0.912 (0.0248)	-0.121 (0.0318)	-0.0835 (0.0361)
Bronx Less Stuyvesant Travel Time		0.346 (0.0647)			0.797 (0.0707)	
Bronx Science Travel Time		0.664 (0.0450)			0.640 (0.0493)	
Bronx Less Brooklyn Travel Time		-4.626 (0.0602)			-4.890 (0.0653)	
Brooklyn Less Stuyvesant Travel Time			-0.287 (0.0667)			-0.496 (0.0715)
Brooklyn Less Bronx Travel Time			-1.186 (0.0276)			-1.181 (0.0306)
Brooklyn Tech Travel Time			-1.120 (0.0518)			-0.862 (0.0554)
Walk Only				0.401 (0.0661)	0.692 (0.0633)	-0.0511 (0.125)
Bus				0.280 (0.159)	0.0863 (0.141)	0.130 (0.263)
Bus and Train				-0.0592 (0.0195)	-0.231 (0.0256)	0.00669 (0.0266)
Walk Only				-1.185 (0.0675)	-0.349 (0.113)	0.0632 (0.0493)
Bus				-0.749 (0.0333)	0.265 (0.0529)	0.106 (0.0307)
Bus and Train				-0.191 (0.0181)	-0.196 (0.0249)	0.0368 (0.0241)
Walk Only				-0.323 (0.0723)	0.612 (0.125)	0.830 (0.254)
Bus				-0.169 (0.0178)	-0.711 (0.0286)	0.923 (0.0423)
Bus and Train				-0.0764 (0.0195)	0.540 (0.0238)	-0.366 (0.0258)
Constant	1.802 (0.136)	-2.554 (0.183)	4.575 (0.187)	1.524 (0.139)	-2.432 (0.188)	4.127 (0.189)
Observations	175739	175739	175739	175739	175739	175739
Pseudo R^2	0.104	0.428	0.173	0.108	0.436	0.180

Standard errors in parentheses

Table 10: Results with Travel Time by Commute Mode

	(1) Stuy	(2) Brook	(3) Bronx	(4) Stuy	(5) Brook	(6) Bronx
main						
Stuyvesant Train Time	-0.921 (0.0702)	-0.933 (0.0882)	0.876 (0.0846)	-0.622 (0.0734)	-0.633 (0.0914)	0.357 (0.0906)
Stuyvesant Bus Time	-0.885 (0.0856)	-1.041 (0.101)	1.193 (0.109)	-0.900 (0.107)	-0.566 (0.127)	1.685 (0.140)
Stuyvesant Walking Time	0.397 (0.0750)	0.414 (0.110)	-1.542 (0.102)	0.798 (0.0819)	0.410 (0.122)	-2.291 (0.115)
Bronx Science Train Time	-0.0711 (0.0318)	0.510 (0.0408)	-2.272 (0.0423)	-0.189 (0.0337)	0.555 (0.0433)	-2.372 (0.0450)
Bronx Science Bus Time	-0.522 (0.0578)	0.250 (0.0684)	-1.993 (0.0734)	-0.310 (0.0706)	0.369 (0.0827)	-1.727 (0.0937)
Bronx Science Walking Time	-0.905 (0.0823)	0.193 (0.0932)	-1.334 (0.113)	-0.988 (0.0879)	0.178 (0.0984)	-1.105 (0.119)
Brooklyn Tech Train Time	0.499 (0.0718)	-0.915 (0.0898)	1.757 (0.0886)	0.299 (0.0756)	-0.925 (0.0934)	1.721 (0.0944)
Brooklyn Tech Bus Time	0.343 (0.0631)	-1.072 (0.0854)	2.237 (0.0787)	0.549 (0.0733)	-1.617 (0.105)	3.301 (0.101)
Brooklyn Tech Walking Time	0.576 (0.0905)	-0.860 (0.125)	2.686 (0.121)	0.179 (0.0976)	-0.825 (0.139)	3.047 (0.133)
Stuyvesant Transfers	0.0273 (0.00959)	-0.0203 (0.0127)	0.0654 (0.0130)	0.0127 (0.0101)	-0.00917 (0.0133)	0.113 (0.0142)
Bronx Science Transfers	-0.0732 (0.0111)	0.0566 (0.0165)	-0.0663 (0.0165)	-0.0652 (0.0122)	0.0494 (0.0191)	0.0353 (0.0184)
Brooklyn Tech Transfers	0.107 (0.00971)	0.0470 (0.0117)	0.123 (0.0128)	0.135 (0.0104)	0.0740 (0.0127)	0.0512 (0.0138)
Distance from SHSAT cutoff	0.00547 (0.0000681)	0.000647 (0.0000943)	0.00437 (0.0000880)	0.00547 (0.0000682)	0.000700 (0.0000945)	0.00434 (0.0000885)
Log of Tract Median Household Income	-0.158 (0.0129)	-0.00310 (0.0174)	0.140 (0.0178)	-0.147 (0.0130)	0.00645 (0.0177)	0.114 (0.0179)
Male	-0.219 (0.0106)	0.333 (0.0148)	-0.284 (0.0141)	-0.220 (0.0106)	0.334 (0.0149)	-0.288 (0.0142)
Black	-0.715 (0.0160)	-0.112 (0.0242)	-0.563 (0.0222)	-0.682 (0.0165)	-0.182 (0.0249)	-0.470 (0.0230)
Hispanic	-0.403 (0.0155)	-0.645 (0.0215)	-0.488 (0.0201)	-0.398 (0.0157)	-0.684 (0.0219)	-0.429 (0.0204)
White	-0.521 (0.0175)	-0.375 (0.0268)	-0.254 (0.0236)	-0.527 (0.0176)	-0.408 (0.0271)	-0.202 (0.0238)
In Public Housing	0.0213 (0.0280)	-0.0839 (0.0397)	0.0821 (0.0383)	0.0316 (0.0283)	-0.0539 (0.0399)	0.0544 (0.0387)
Recieved Free Lunch	0.286 (0.0174)	0.195 (0.0239)	-0.427 (0.0225)	0.278 (0.0174)	0.178 (0.0240)	-0.395 (0.0227)
047	1.045 (0.0416)	2.140 (0.0538)	-3.016 (0.0531)	1.008 (0.0428)	2.085 (0.0546)	-3.074 (0.0569)
061	1.539 (0.0312)	-0.0468 (0.0338)	-0.925 (0.0422)	1.488 (0.0334)	0.0413 (0.0353)	-1.155 (0.0475)
081	1.447 (0.0375)	0.198 (0.0407)	-0.952 (0.0473)	1.423 (0.0386)	0.219 (0.0416)	-1.132 (0.0512)
8th Grade Year=2006	0.0203 (0.0246)	-0.153 (0.0365)	-0.127 (0.0338)	0.0188 (0.0247)	-0.153 (0.0366)	-0.127 (0.0340)
8th Grade Year=2007	-0.124 (0.0239)	-0.297 (0.0349)	-0.125 (0.0327)	-0.126 (0.0240)	-0.300 (0.0349)	-0.125 (0.0329)
8th Grade Year=2008	-0.183 (0.0236)	-0.343 (0.0341)	-0.0734 (0.0321)	-0.185 (0.0236)	-0.346 (0.0341)	-0.0760 (0.0323)
8th Grade Year=2009	-0.247 (0.0236)	-0.276 (0.0344)	-0.125 (0.0321)	-0.250 (0.0236)	-0.279 (0.0344)	-0.127 (0.0323)
8th Grade Year=2010	-0.346 (0.0235)	-0.316 (0.0340)	-0.0481 (0.0319)	-0.351 (0.0235)	-0.322 (0.0341)	-0.0455 (0.0321)
8th Grade Year=2011	-0.464 (0.0239)	-0.270 (0.0345)	-0.117 (0.0322)	-0.468 (0.0239)	-0.274 (0.0345)	-0.118 (0.0324)
8th Grade Year=2012	-0.579 (0.0244)	-0.335 (0.0347)	-0.100 (0.0327)	-0.585 (0.0244)	-0.339 (0.0348)	-0.101 (0.0328)
8th Grade Year=2013	-0.707 (0.0244)	-0.134 (0.0355)	-0.0516 (0.0324)	-0.713 (0.0244)	-0.138 (0.0355)	-0.0504 (0.0326)
8th Grade Year=2014	-0.916 (0.0250)	-0.0746 (0.0360)	-0.139 (0.0327)	-0.922 (0.0250)	-0.0779 (0.0361)	-0.146 (0.0328)
Walk Only				0.192 (0.0697)	0.532 (0.126)	-0.233 (0.0661)
Bus				0.605 (0.162)	0.632 (0.265)	-1.289 (0.148)
Bus and Train				0.199 (0.0289)	-0.00756 (0.0382)	-0.573 (0.0411)
Walk Only				-0.601 (0.0695)	0.00579 (0.0505)	-0.468 (0.116)
Bus				-0.233 (0.0418)	0.0347 (0.0379)	-0.311 (0.0682)
Bus and Train				-0.177 (0.0238)	-0.00570 (0.0295)	-0.181 (0.0315)
Walk Only				-0.127 (0.0730)	-0.0540 (0.256)	0.739 (0.126)
Bus				-0.258 (0.0362)	0.781 (0.0739)	-0.828 (0.0649)
Bus and Train				-0.281 (0.0242)	-0.121 (0.0360)	0.276 (0.0338)
Constant	1.583 (0.145)	2.287 (0.193)	1.514 (0.199)	1.577 (0.148)	1.978 (0.195)	2.259 (0.204)
Observations	175739	175739	175739	175739	175739	175739
Pseudo R^2	0.122	0.203	0.464	0.123	0.205	0.468

Standard errors in parentheses

Table 11: First Choice School Model Results

	(1) FirstChoiceEncoded			
	Bronx	Brook	Other	Stuyvesant
Stuyvesant Travel Time	-0.350	-0.936	0	-1.295
	(0.0907)	(0.0858)	(.)	(0.0775)
Bronx Science Travel Time	-2.240	2.219	0	-0.0870
	(0.0391)	(0.0412)	(.)	(0.0332)
Brooklyn Tech Travel Time	2.741	-2.790	0	0.0545
	(0.0845)	(0.0781)	(.)	(0.0704)
Stuyvesant Transfers	0.172	-0.204	0	-0.111
	(0.0146)	(0.0139)	(.)	(0.0125)
Bronx Science Transfers	-0.268	-0.406	0	-0.263
	(0.0180)	(0.0158)	(.)	(0.0149)
Brooklyn Tech Transfers	0.277	0.0929	0	0.181
	(0.0160)	(0.0159)	(.)	(0.0143)
Distance from SHSAT cutoff	0.00361	-0.000412	0	0.00647
	(0.000128)	(0.000115)	(.)	(0.000107)
Log of Tract Median Household Income	-0.0288	-0.315	0	-0.235
	(0.0238)	(0.0218)	(.)	(0.0204)
Male	-0.141	0.326	0	-0.112
	(0.0197)	(0.0176)	(.)	(0.0165)
Black	-0.773	-0.0229	0	-0.906
	(0.0302)	(0.0242)	(.)	(0.0229)
Hispanic	-0.546	-0.289	0	-0.745
	(0.0291)	(0.0262)	(.)	(0.0236)
White	0.339	0.395	0	-0.276
	(0.0347)	(0.0317)	(.)	(0.0296)
In Public Housing	0.0927	-0.172	0	0.0535
	(0.0527)	(0.0456)	(.)	(0.0435)
Recieved Free Lunch	-0.450	0.218	0	0.185
	(0.0316)	(0.0303)	(.)	(0.0275)
8th Grade Year=2006	-0.199	-0.252	0	-0.176
	(0.0530)	(0.0475)	(.)	(0.0444)
8th Grade Year=2007	-0.256	-0.409	0	-0.418
	(0.0503)	(0.0453)	(.)	(0.0422)
8th Grade Year=2008	-0.209	-0.329	0	-0.420
	(0.0496)	(0.0446)	(.)	(0.0418)
8th Grade Year=2009	-0.266	-0.331	0	-0.513
	(0.0495)	(0.0444)	(.)	(0.0417)
8th Grade Year=2010	-0.394	-0.492	0	-0.728
	(0.0483)	(0.0433)	(.)	(0.0406)
8th Grade Year=2011	-0.453	-0.617	0	-0.924
	(0.0481)	(0.0431)	(.)	(0.0405)
8th Grade Year=2012	-0.594	-0.756	0	-1.149
	(0.0481)	(0.0431)	(.)	(0.0405)
8th Grade Year=2013	-0.549	-0.810	0	-1.284
	(0.0474)	(0.0424)	(.)	(0.0401)
8th Grade Year=2014	-0.582	-0.693	0	-1.457
	(0.0476)	(0.0423)	(.)	(0.0406)
Constant	2.512	4.472	0	6.848
	(0.262)	(0.237)	(.)	(0.223)
Observations	175739			
Pseudo R^2	0.243			

Standard errors in parentheses

Table 12: Linear Probability Model Results

	(1) Stuy	(2) Bronx	(3) Brook	(4) Stuy	(5) Bronx	(6) Brook
Stuyvesant Travel Time	-0.333 (0.0103)	-0.235 (0.00806)	-0.0330 (0.00734)	-0.254 (0.0111)	-0.284 (0.00868)	0.00124 (0.00795)
Bronx Science Travel Time	0.0573 (0.00422)	-0.501 (0.00331)	0.173 (0.00301)	0.0225 (0.00475)	-0.510 (0.00370)	0.171 (0.00339)
Brooklyn Tech Travel Time	0.0636 (0.00960)	0.774 (0.00752)	-0.292 (0.00685)	0.0638 (0.0101)	0.815 (0.00790)	-0.292 (0.00723)
Stuyvesant Transfers	0.00753 (0.00168)	0.0621 (0.00131)	-0.00921 (0.00120)	0.0143 (0.00187)	0.0618 (0.00146)	-0.00255 (0.00134)
Bronx Science Transfers	0.0217 (0.00191)	0.0441 (0.00150)	-0.00938 (0.00136)	0.0263 (0.00223)	0.0486 (0.00174)	-0.00848 (0.00159)
Brooklyn Tech Transfers	0.0124 (0.00190)	0.0341 (0.00149)	0.00440 (0.00136)	0.0135 (0.00204)	0.0164 (0.00159)	0.0121 (0.00145)
Distance from SHSAT cutoff	0.00119 (0.0000137)	0.000525 (0.0000107)	0.0000722 (0.00000976)	0.00118 (0.0000137)	0.000506 (0.0000106)	0.0000806 (0.00000975)
Log of Tract Median Household Income	-0.00602 (0.00256)	0.0465 (0.00201)	-0.0120 (0.00183)	-0.00140 (0.00257)	0.0426 (0.00200)	-0.00859 (0.00183)
Male	-0.0451 (0.00219)	-0.0324 (0.00171)	0.0350 (0.00156)	-0.0451 (0.00218)	-0.0322 (0.00170)	0.0350 (0.00156)
Black	-0.215 (0.00309)	-0.0968 (0.00242)	-0.0108 (0.00220)	-0.192 (0.00323)	-0.0687 (0.00252)	-0.0175 (0.00231)
Hispanic	-0.123 (0.00325)	-0.0762 (0.00254)	-0.0765 (0.00232)	-0.116 (0.00328)	-0.0612 (0.00256)	-0.0823 (0.00234)
White	-0.140 (0.00368)	-0.0945 (0.00288)	-0.0168 (0.00263)	-0.137 (0.00369)	-0.0823 (0.00288)	-0.0226 (0.00264)
In Public Housing	0.0414 (0.00561)	0.0526 (0.00440)	-0.0153 (0.00400)	0.0440 (0.00565)	0.0398 (0.00440)	-0.00730 (0.00403)
Recieved Free Lunch	0.0526 (0.00360)	-0.0754 (0.00282)	0.0265 (0.00257)	0.0504 (0.00360)	-0.0695 (0.00281)	0.0222 (0.00257)
8th Grade Year=2006	0.00331 (0.00520)	-0.0146 (0.00408)	-0.0147 (0.00371)	0.00328 (0.00519)	-0.0145 (0.00405)	-0.0145 (0.00371)
8th Grade Year=2007	-0.0289 (0.00504)	-0.0144 (0.00395)	-0.0301 (0.00360)	-0.0286 (0.00503)	-0.0137 (0.00392)	-0.0302 (0.00359)
8th Grade Year=2008	-0.0399 (0.00496)	-0.00561 (0.00389)	-0.0361 (0.00354)	-0.0400 (0.00495)	-0.00589 (0.00386)	-0.0359 (0.00353)
8th Grade Year=2009	-0.0546 (0.00496)	-0.0141 (0.00388)	-0.0281 (0.00354)	-0.0552 (0.00494)	-0.0142 (0.00385)	-0.0280 (0.00353)
8th Grade Year=2010	-0.0744 (0.00493)	-0.00564 (0.00386)	-0.0319 (0.00351)	-0.0756 (0.00491)	-0.00514 (0.00383)	-0.0323 (0.00351)
8th Grade Year=2011	-0.0979 (0.00498)	-0.0126 (0.00390)	-0.0272 (0.00355)	-0.0990 (0.00496)	-0.0128 (0.00387)	-0.0273 (0.00354)
8th Grade Year=2012	-0.122 (0.00505)	-0.00925 (0.00396)	-0.0344 (0.00360)	-0.124 (0.00504)	-0.00929 (0.00393)	-0.0348 (0.00360)
8th Grade Year=2013	-0.146 (0.00502)	-0.00657 (0.00393)	-0.0123 (0.00358)	-0.148 (0.00500)	-0.00619 (0.00390)	-0.0128 (0.00357)
8th Grade Year=2014	-0.184 (0.00506)	-0.0158 (0.00397)	-0.00677 (0.00361)	-0.186 (0.00505)	-0.0161 (0.00393)	-0.00708 (0.00360)
Walk Only				0.0901 (0.0132)	0.0286 (0.0103)	-0.0125 (0.00941)
Bus				0.0516 (0.0297)	-0.0944 (0.0232)	0.00170 (0.0212)
Bus and Train				-0.0101 (0.00401)	-0.0352 (0.00313)	-0.00781 (0.00286)
Walk Only				-0.186 (0.0105)	-0.0929 (0.00820)	-0.0114 (0.00751)
Bus				-0.126 (0.00610)	-0.0710 (0.00475)	-0.00352 (0.00435)
Bus and Train				-0.0422 (0.00375)	-0.0213 (0.00292)	-0.00239 (0.00268)
Walk Only				-0.0691 (0.0149)	0.0732 (0.0116)	-0.0192 (0.0106)
Bus				-0.0378 (0.00369)	-0.0689 (0.00288)	0.0321 (0.00264)
Bus and Train				-0.0188 (0.00400)	0.107 (0.00312)	-0.0512 (0.00286)
Constant	0.863 (0.0281)	0.240 (0.0220)	1.040 (0.0200)	0.801 (0.0284)	0.301 (0.0222)	0.982 (0.0203)
Observations	175739	175739	175739	175739	175739	175739
R^2	0.132	0.472	0.155	0.137	0.480	0.159

Standard errors in parentheses

Table 13: Results for Rejecting Admission Offers

	(1) Reject Stuyvesant	(2) Reject Bronx	(3) Reject Brooklyn
Travel Time	-0.0387	0.212	0.788
	(0.202)	(0.0961)	(0.110)
Transfers	0.196	0.0209	0.232
	(0.0597)	(0.0472)	(0.0391)
Distance from SHSAT cutoff	-0.000558	-0.00283	-0.00722
	(0.00140)	(0.00105)	(0.000920)
Log of Tract Median Household Income	0.569	0.204	0.659
	(0.0968)	(0.0606)	(0.0489)
Male	-0.355	-0.558	-0.551
	(0.0839)	(0.0545)	(0.0420)
Black	1.554	0.821	0.505
	(0.235)	(0.136)	(0.0713)
Hispanic	1.279	0.950	0.896
	(0.202)	(0.100)	(0.0720)
White	0.930	0.937	0.980
	(0.108)	(0.0741)	(0.0531)
In Public Housing	0.649	0.0450	0.380
	(0.287)	(0.185)	(0.162)
Recieved Free Lunch	-0.363	-0.357	-0.987
	(0.0978)	(0.0649)	(0.0520)
8th Grade Year=2006	0.0379	0.0360	-0.0595
	(0.187)	(0.124)	(0.0964)
8th Grade Year=2007	0.212	0.257	0.00197
	(0.181)	(0.118)	(0.0935)
8th Grade Year=2008	-0.297	0.110	-0.0879
	(0.199)	(0.121)	(0.0942)
8th Grade Year=2009	-0.0322	0.0306	0.0581
	(0.195)	(0.124)	(0.0943)
8th Grade Year=2010	-0.101	0.189	0.123
	(0.198)	(0.122)	(0.0931)
8th Grade Year=2011	0.183	0.0357	-0.0840
	(0.183)	(0.123)	(0.0932)
8th Grade Year=2012	0.258	-0.0580	-0.0159
	(0.184)	(0.127)	(0.0946)
8th Grade Year=2013	0.229	-0.137	-0.0729
	(0.188)	(0.128)	(0.0961)
8th Grade Year=2014	0.287	-0.0113	-0.0466
	(0.186)	(0.126)	(0.0938)
Constant	-8.602	-3.456	-7.885
	(1.133)	(0.675)	(0.549)
Observations	6802	7910	13756
Pseudo R^2	0.074	0.066	0.137

Standard errors in parentheses