

Informing the Debate:
Comparing Boston's Charter, Pilot and Traditional
Schools

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TECHNICAL APPENDIX

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Table of Contents

Data Appendix	1
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Observational Results with Peer Controls

Table T.1: Observational Results with Peer Controls	8
Table T.2: Observational Results by Lottery Status with Peer Controls.....	9

Observational Results with Coefficients on Demographics and Baseline Controls

Table T.3: High School Observational Results	10
Table T.4: Middle School Observational Results.....	12
Table T.5: Elementary School Observational Results.....	13
Table T.6: High School Observational Results by Lottery Status.....	14
Table T.7: Middle School Observational Results by Lottery Status	16

Charter Lottery Results with Coefficients on Demographics and Baseline Controls

Table T.8: Charter High School ELA Lottery Results	17
Table T.9: Charter High School Math Lottery Results.....	18
Table T.10: Charter High School Writing Topic Lottery Results	19
Table T.11: Charter High School ELA Writing Composition Results.....	20
Table T.12: Charter Middle School ELA Lottery Results.....	21
Table T.13: Charter Middle School Math Lottery Results	22

Pilot Lottery Results with Coefficients on Demographics and Baseline Controls

Table T.14: Pilot High School ELA Lottery Results.....	23
Table T.15: Pilot High School Math Lottery Results	24
Table T.16: Pilot High School Writing Topic Lottery Results.....	25
Table T.17: Pilot High School ELA Writing Composition Results	26
Table T.18: Pilot Middle School ELA Lottery Results	27
Table T.19: Pilot Middle School Math Lottery Results	28
Table T.20: Pilot Elementary School ELA Lottery Results	29
Table T.21: Pilot Elementary School Math Lottery Results.....	30

Data Appendix

A. Constructing the Research Data Base

STEP 1: CONSTRUCTING A STATE MASTER FILE FROM SIMS

Data for this study come from the Massachusetts Student Information Management System (SIMS) and State MCAS database. We received SIMS files for the 2001-2002 to 2006-2007 school years. Each SIMS file contains snapshots for October and the end of the year. The SIMS records demographic information, school codes, town of residence and days of attendance for each student in Massachusetts. Typically, there is one record in the SIMS for each student, year, and school attended. For example, a student who attended two schools in 2003 has two SIMS records for that year. In some cases multiple records are generated for a given student, school, and year due to a status or grade change (e.g., a student switches into an LEP program).

Schools were classified as follows:

Pilot schools: These schools are listed on the pilot school network website <http://www.ccebos.org/pilotschools/schools.html>

Charter schools: These schools were identified from the Massachusetts Department of Elementary and Secondary Education (ESE) website <http://www.profiles.doe.mass.edu>.

Boston-area charter schools: This includes charter schools inside the boundaries of Boston Public Schools (BPS) district as well as charters that are within 5 miles of the BPS district boundary that accept BPS students. Boston charters include two charter schools inside the city that have since closed, Fredrick Douglass Charter School and Roxbury Charter High School.

Health Careers Academy is a Horace Mann Charter School and a pilot school. For the purposes of our study, it was categorized as a Boston-area charter school since it uses the charter school lottery process and not the Boston school choice mechanism. Boston Day and Evening Charter, also a Horace Mann charter, serves over-age students. This school, along with Greater Egleston Community High School, a pilot school that also serves older students, was designated as an alternative/special education school.

Boston public schools: These schools were identified from the Massachusetts ESE website

Any school, including pilot or exam schools, with a BPS prefix is initially counted. But the category “traditional BPS schools” includes only schools with a BPS prefix that are not pilot schools, exam schools, or alternative/special education schools.

Exam schools: Boston Latin School, Boston Latin Academy, and the John D. O’Bryant School of Mathematics and Science

Alternative / special education schools: This category includes any school listed as an alternative school on the ESE website or the Boston Public Schools website. Finally, Boston Day and Evening Academy (a Horace Mann Charter School and pilot school) and Greater Egleston School (a pilot school) are both alternative schools because they serve older students.

We retain the first observation of a student in a grade. School designation is grade-specific. For example, a student could be in a pilot school in 7th grade and a charter school in 8th grade. When students repeat grades, we keep the first school in grade. Students attending multiple schools in a given school year are assigned as follows:

1. A student is assigned to a Boston-area charter or a pilot school if any record for the grade shows attendance at a Boston area-charter or a pilot.
2. If a student attends multiple Boston area charters or pilots, or both a Boston area charter and pilot, the student is assigned to school for which the attendance duration is longest. Ties are broken randomly.
3. Students who attend multiple schools, neither of which is a charter or a pilot, and one of which is an exam school, statewide charter, or alternative/special education school, they are placed into one of these three categories.
4. Students who attend more than one exam, statewide charter or alternative/special education school are assigned using an algorithm similar to step 2 above.
5. Students attending multiple traditional BPS schools are assigned to the school of the longest attendance duration. Ties are broken randomly.

This process removes all duplicate observations of students by year. The resulting file is called the “state master file”.

STEP 2: MERGING THE STATE MASTER FILE TO MCAS SCORES

Our MCAS data base has raw MCAS scores for math, ELA, and writing in grades 3-8 and 10 from spring 2002-2007. We standardize scores by subject, grade, and year to the combined Boston Public Schools and Boston-area charter schools population. MCAS scores were merged to the state master file using unique student identifiers (the SASID). Students in the MCAS file but not the state master are excluded since they cannot be assigned to schools. This file is the “state master - MCAS match”.

This file contributes to the observational study as described below in Section B. The quasi-experimental charter and pilot lottery studies begin with lottery applicant data which is then matched to the state master - MCAS match file as described below in Sections C and D.

B. Constructing the Sample for the Observational Study

The state master - MCAS match file is analyzed separately by school level (high school, middle school, and elementary school). Files for each level include the subjects and outcome years listed in Table 5. The high school and middle school files retain outcomes for Spring 2004-2007. This corresponds to baseline cohorts (8th grade for high school, 4th grade for middle school) from

Spring 2002-2005. Elementary school outcomes are for Spring 2005-2007. This corresponds to baseline (kindergarten) cohorts from spring 2002 and 2003.

Baseline years are defined as the year a student attended 8th grade for the high school sample, the year a student attended 4th grade for the middle school sample, and the year a student attended kindergarten for the elementary school sample. The regressions in Tables 6 and 12 were estimated using the following restrictions applied to the high school, middle school, or elementary school state master - MCAS match:

1. Students have demographic information from their baseline year.
2. Students reside in Boston and attended either a BPS school or a Boston-area charter in their baseline year.
3. Students reside in Boston and attended either a BPS school or a Boston-area charter in the test year.

C. Constructing the Sample and Instruments for the Quasi-Experimental Charter Study

Tables 7, 9, 10, and 11 report results for students who applied to charter schools in our sample of schools. These schools use lotteries to assign seats. The data set for this analysis begins with school applicant lists, without any information from the state.

Individual charter schools provided us with records of their lottery and waitlist process. All charter middle schools and high schools provided us with some records, but some schools had records insufficiently complete or detailed for a lottery-based analysis. Table A.5 lists schools and years included in the quasi-experimental study.

Among schools with complete records, some offered seats to all applicants. These schools were included only if there was an adequately documented initial offer that did not go to everyone. The distinction between *initial offer* and *ever offer* is described below.

Schools were included if they provided the following information for all applicants: student name, year of application, and grade of application, the students' lottery and waitlist numbers (where relevant). Some schools indicated whether a student was offered a seat but did not provide lottery numbers. We also obtained the lottery-number cutoffs that determined whether students were offered a seat. Some schools provided demographic characteristics that we used to improve our match to state data.

Students were matched to state data by name, year, and grade. Students with duplicate names or ambiguous matches were assigned using date of birth, gender, race, and town of residence. We excluded students with sibling priority (who were not subject to random assignment) or students who applied after the lottery drawing date (potentially non-random "late applications").

The resulting data set is called the "charter lottery file".

The charter lottery file was merged to the state master - MCAS match dataset, retaining students in the charter lottery file only.

The regressions in Tables 10 and 11 were constructed using the following sample restrictions:

1. Students in the charter lottery file.
2. Students with demographic information from their baseline year.
3. Students who reside in Boston and attended either a BPS school or a Boston area charter in their baseline year.

Charter Offer Instruments

In some cases, we coded offers by listing the lottery numbers of applicants offered seats, while other schools identified applicants who received offers but were unable to provide individual applicants' lottery numbers. In all cases, our offer instruments indicate students who received an offer from a school in their charter risk set. The charter risk set is a unique collection of schools in a given year. For example, a student who applies to two schools 2005 is in the risk set defined by those two schools in 2005. His offer variables indicate that he received an offer from at least one of these schools in that year's lottery.

Where possible, we defined two versions of the offer variable: initial offer and ever offer. For all schools in the charter study, we coded a dummy indicating whether applications present for the lottery drawing ever received an offer. The *ever offer* instrument indicates students who ever received an offer from a school in their risk set. Some of these students received an offer right after the drawing, and some received an offer later, as the school made offers down its waiting list (the waiting list we refer to includes only applicants present at the time of random assignment). For applicants to schools that provided lottery numbers and maintained a documented waiting list, we also coded a dummy indicating those who received an offer right away. The *initial offer* instrument indicates students who received at least one initial offer from a school in the risk set. For schools where we only have ever offer information, initial offer is coded as zero for all students (charter regressions control for the availability of initial offer data in the risk set). Our instruments are coded so that initial offer=1 implies ever offer=1. In risk sets where all students received an offer, ever offer=1 for all applicants.

D. Constructing the Sample and Instruments for the Quasi-Experimental Pilot Study

Tables 7, 8, and 12 report results for students who go through the Boston school choice mechanism and select a pilot school as their first choice.

BPS provided us with records of student applications to the Boston school choice program. We used only the first round of the student assignment report. We used information on: student ID, year and grade of application, first choice school, priority status, assigned school, and the BPS-assigned random number used to break ties within priority groups. From this pool of applicants, we excluded students who were guaranteed their first choice and students with sibling priority.

The resulting file is called the "pilot lottery file."

The pilot lottery file was matched to the state master - MCAS match dataset using state identifiers, retaining only students in the pilot lottery file. Students who apply to pilot schools that are undersubscribed, only admit guaranteed students, or admit students by application without random assignment are also excluded.

The regressions in Table 11 were run using the following sample:

1. Students in the pilot lottery file.
2. Students with demographic information from their baseline year.
3. Students who resided in Boston and attended either a BPS school or a Boston area charter in their baseline year.

Pilot Offer instrument

The pilot risk set is defined by grade, year of application, first choice school, and walk zone status. The pilot offer instrument is a dummy variable indicating whether a student lottery number rank within his risk set was below the number of students assigned to their first choice in the risk set (after excluding guaranteed students and students with sibling priority).

The Pilot K-8/6-8 Middle school sample

Pilot middle schools may include grades 6-8 or K-8. The K-8 schools admit students at kindergarten (K2) and 6th grade, but often have very few seats available in 6th since students advancing from lower grades are guaranteed. Our pilot lottery file includes applicants to both 6-8 and K-8 schools, as follows:

- 6th grade applicants: we include applicants to schools that start in 6th grade and applicants for 6th grade to schools that begin in kindergarten from 2003-2006.
- K2 applicants: we include applicants for K2 to K-8 schools in 1997-2000.

Outcome scores for both sets of students are 6th, 7th, and 8th grade MCAS scores from 2004-2007. Demographic information for K2 applicants comes from BPS files since our state files do not go back far enough. K2 applicants to K-8 middle schools have no baseline test scores.

Key Concepts and Definitions

This section collects key concepts and definitions used in the study.

Years in charter (or pilot): This variable counts grades a student is enrolled in a charter (or pilot). Repeated grades are counted only once. The counting window runs from entry grade to test date at each school level (for K2 applicants, entry grade is taken to be the kindergarten year; for middle school applicants, entry grade is 5th grade for the one charter school that begins at 5th and 6th grade for all other schools; for high school applicants, entry grade is 9th grade). Incomplete grades in a pilot or charter school increment the counter by 1.

Baseline year: This defines the year a student attended 8th grade for the high school analyses, the year a student attended 4th grade for the middle school analyses, and the year a student attended kindergarten for the elementary school analyses.

Charter or Pilot Lottery samples: This defines the analysis samples for the pilot and charter lottery study. All students in the pilot lottery sample must apply to a school that is oversubscribed and uses the Boston school choice mechanism (only 2 pilot high schools use the Boston school choice mechanism; other pilot high schools admit by application). All students in the charter lottery sample applied to at least one school for which we could code offers, and for which at least one offer variable was informative. Siblings are excluded from both samples; late applicants are excluded from the charter lottery sample. Students must also reside in Boston and have attended a BPS or Boston-area charter school in their baseline year.

Schools and application years included in each of the samples are listed in Table A.5.

The pilot lottery sample consists of:

- (Elementary school) applicants for K2 to elementary and K-8 pilot schools in 2002 and 2003.
- (Middle school) applicants for 6th grade to 6-8 and K-8 pilot schools in 2003-2006; applicants for K2 to K-8 pilot schools in 1997-2000.
- (High school) applicants for 9th grade to high school pilots in 2003-2005.

The charter lottery sample consists of:

- (Middle school) applicants for 5th grade to the charter school that has entry at 5th grade 2002-2005; applicants for 6th grade to the charter schools with entry at 6th grade in 2003-2006.
- (High school) applicants for 9th grade to high school charters in 2002-2005.

Initial offer: This defines students with a lottery number below the highest number called in the first round of a charter lottery. The initial offer variable is non-zero only for charter applicants with information on lottery numbers and for schools that provided information on the numbers called in the initial round.

Ever offer: This defines students who were ever offered a seat at any charter school in their risk set.

Charter risk set: this identifies the set of schools a student applied to in a given year. To illustrate, suppose there are three charter schools (A, B, and C). Students can apply to any one (A, B, or C), any set of two (AB, BC, AC), or all three (ABC). Each group of schools is an element in the charter school risk set. By identifying the charter risk set, we compare charter applicants to other applicants who apply to the same set of school. Within charter risk sets, the likelihood of getting a charter offer is determined solely by a student's lottery number at the charter schools in the set.

Pilot risk set: this identifies the first choice school, walk zone priority, and (for the middle school sample) grade of application for a student in a given year. Within pilot risk sets, the likelihood of getting a pilot offer is determined solely by a student's lottery number in the Boston assignment mechanism.

Table T.1: Regression Results for Pilot and Charter Including Peer Controls

Table 7.1: Regression Results for Pilot and Charter Including Peer Controls											
	Subject	Demographics					Demographics + Baseline Scores				
		Pilot (1)	Charter (2)	Exam (3)	Alternative (4)	N	Pilot (5)	Charter (6)	Exam (7)	Alternative (8)	N
Elementary School											
	ELA	0.014 (0.027)	0.039* (0.023)	- -	-0.074 (0.068)	11599	- -	- -	- -	- -	-
	Math	0.023 (0.035)	0.005 (0.030)	- -	-0.210*** (0.073)	8885	- -	- -	- -	- -	-
Middle School											
	ELA	-0.098*** (0.017)	0.046** (0.018)	0.149*** (0.038)	-0.070 (0.072)	24524	-0.045*** (0.017)	0.059*** (0.016)	-0.064* (0.039)	-0.187*** (0.059)	23574
	Math	-0.137*** (0.021)	0.076*** (0.025)	0.171*** (0.053)	0.052 (0.070)	28800	-0.076*** (0.018)	0.103*** (0.023)	-0.074 (0.051)	-0.080 (0.058)	27863
High School											
	ELA	0.149*** (0.021)	0.210*** (0.030)	0.303*** (0.036)	-0.008 (0.089)	13379	0.070*** (0.020)	0.157*** (0.029)	0.066 (0.048)	0.086 (0.073)	9308
	Math	0.076** (0.033)	0.219*** (0.051)	0.352*** (0.049)	0.129 (0.098)	13181	0.019 (0.030)	0.130*** (0.047)	-0.012 (0.065)	0.068 (0.074)	12747
	Writing Topic	0.140*** (0.028)	0.193*** (0.035)	0.232*** (0.050)	-0.055 (0.076)	13115	0.080*** (0.031)	0.132*** (0.037)	-0.002 (0.069)	-0.073 (0.075)	9223
	Writing Composition	0.131*** (0.023)	0.183*** (0.034)	0.223*** (0.035)	0.023 (0.077)	13115	0.092*** (0.023)	0.136*** (0.035)	0.097 (0.059)	0.000 (0.090)	9223

Notes: This table reports the coefficients on regressions using years spent in types of schools. The excluded group are students in traditional BPS schools. Coefficients are estimated for years spent in pilot schools, charter schools, exam schools, and alternative schools. Sample restricted to students with baseline demographic characteristics. Demographics include female, black, hispanic, asian, other race, special education, limited english proficiency, free/reduced price lunch, and a female*minority dummy. Regressions also include year of test and year of birth dummies. Middle school and elementary school regressions pool grade outcomes and include dummies for grade level. Regressions use robust standard errors and are clustered on year by 10th grade school for high school and student identifier and school by year for the pooled middle school and elementary school regressions. This regression also includes peer controls at outcome school by year by grade combination. These include the mean peer demographic characteristics of these groups in the demographics model, and mean peer demographics and mean peer baseline test scores in the demographics and baseline test score models.

* significant at 10%; ** significant at 5%; *** significant at 1%

Table T.2: Regression Results for Pilots and Charters by School Lottery Status Including Peer Controls					
		Demographics + Baseline Scores			
		Pilot		Charter	
		Not in Lottery Sample	In Lottery Sample	Not in Lottery Sample	In Lottery Sample
Level	Subject	(1)	(2)	(3)	(4)
Middle School					
	ELA	-0.013 (0.025)	-0.039* (0.021)	0.048*** (0.018)	0.121*** (0.019)
	Math	0.000 (0.028)	-0.097*** (0.020)	0.057** (0.024)	0.294*** (0.036)
High School					
	ELA	0.046** (0.022)	0.123*** (0.028)	0.146*** (0.038)	0.162*** (0.035)
	Math	-0.026 (0.029)	0.115*** (0.043)	0.134*** (0.038)	0.119 (0.074)
	Writing Topic	0.023 (0.032)	0.208*** (0.032)	0.105* (0.054)	0.145*** (0.044)
	Writing Composition	0.060*** (0.023)	0.163*** (0.030)	0.129*** (0.048)	0.134*** (0.039)

Notes: This table reports similar regressions to those in Table T.1. The observation counts are the same as is Table 6, as are the coefficients for non charter non pilot schools. The only difference is that they include separate dummies for pilot and charter schools with and without randomized lotteries. Only schools with randomized lotteries are included in the lottery regressions. Lotteries may not occur if a school accepts students by application (pilot high schools), if a school is undersubscribed, or if a school admits only guaranteed students. This regression also includes peer controls at outcome school by year by grade combination. These include the mean peer demographic characteristics of these

* significant at 10%; ** significant at 5%; *** significant at 1%

Table T.3: Regression Results, High Schools

	ELA			Math		
	No Controls (1)	Demographics (2)	Demographics + Baseline Scores (3)	No Controls (4)	Demographics (5)	Demographics + Baseline Scores (6)
Years in Charter	0.307*** (0.031)	0.238*** (0.024)	0.170*** (0.022)	0.277*** (0.055)	0.258*** (0.049)	0.158*** (0.040)
Years in Pilot	0.226*** (0.024)	0.175*** (0.019)	0.115*** (0.017)	0.170*** (0.031)	0.134*** (0.029)	0.059** (0.026)
Years in Exam School	0.619*** (0.031)	0.446*** (0.024)	0.238*** (0.023)	0.743*** (0.036)	0.578*** (0.029)	0.224*** (0.024)
Years in Alternative or Special Ed School	-0.270*** (0.040)	-0.096* (0.053)	0.014 (0.045)	-0.208*** (0.043)	-0.032 (0.051)	-0.024 (0.055)
Baseline Score			0.507*** (0.021)			0.620*** (0.015)
Female		0.063** (0.027)	0.004 (0.032)		-0.114*** (0.030)	-0.03 (0.019)
Black		-0.256*** (0.027)	-0.102*** (0.024)		-0.344*** (0.033)	-0.112*** (0.020)
Hispanic		-0.180*** (0.029)	-0.080*** (0.025)		-0.227*** (0.035)	-0.085*** (0.021)
Asian		-0.053 (0.035)	-0.006 (0.029)		0.215*** (0.046)	0.051 (0.033)
Other Race		-0.137 (0.111)	0.023 (0.100)		-0.251** (0.113)	-0.093 (0.089)
Special Education		-0.684*** (0.030)	-0.353*** (0.026)		-0.602*** (0.031)	-0.209*** (0.026)
Limited English Proficiency		-0.519*** (0.031)	-0.015 (0.030)		-0.140*** (0.032)	0.056** (0.024)
Free or Reduced Lunch		-0.049*** (0.017)	-0.016 (0.018)		-0.007 (0.019)	0.014 (0.015)
Female X Black or Hispanic		0.045 (0.028)	0.04 (0.031)		0.066* (0.036)	0.042* (0.025)
Observations	13379	13379	9308	13181	13181	12747
R Squared	0.371	0.484	0.618	0.436	0.513	0.694

Notes: This table reports the coefficients on regressions using years spent in types of schools. The excluded group are students in traditional BPS schools. Coefficients are estimated for years spent in pilot schools, charter schools, exam schools, and alternative schools. Sample restricted to students with baseline demographic characteristics. Demographics include female, black, hispanic, asian, other race, special education, limited english proficiency, free/reduced price lunch, and a female*minority dummy. Regressions also include year of test and year of birth dummies. Middle school and elementary school regressions pool grade outcomes and include dummies for grade level. Regressions use robust standard errors and are clustered on year by 10th grade school for high school and student identifier and school by year for the pooled middle school and elementary school regressions.

Table T.3 Continued: Regression Results, High Schools

	Writing Topic Development			Writing Composition		
	No Controls (7)	Demographics (8)	Demographics + Baseline Scores (9)	No Controls (10)	Demographics (11)	Demographics + Baseline Scores (12)
Years in Charter	0.282*** (0.032)	0.228*** (0.029)	0.196*** (0.033)	0.288*** (0.028)	0.207*** (0.026)	0.173*** (0.027)
Years in Pilot	0.197*** (0.029)	0.160*** (0.027)	0.147*** (0.028)	0.198*** (0.025)	0.146*** (0.022)	0.128*** (0.021)
Years in Exam School	0.501*** (0.036)	0.372*** (0.029)	0.316*** (0.031)	0.448*** (0.022)	0.303*** (0.019)	0.233*** (0.018)
Years in Alternative or Special Ed School	-0.255*** (0.064)	-0.111* (0.059)	-0.088 (0.059)	-0.187** (0.074)	-0.053 (0.065)	-0.085 (0.070)
Baseline Score			0.236*** (0.015)			0.257*** (0.018)
Female		0.184*** (0.037)	0.156*** (0.046)		0.070** (0.030)	0.054 (0.037)
Black		-0.124*** (0.034)	-0.063 (0.039)		-0.182*** (0.027)	-0.097*** (0.028)
Hispanic		-0.088** (0.036)	-0.061 (0.044)		-0.130*** (0.031)	-0.074** (0.034)
Asian		0.043 (0.052)	0.028 (0.060)		-0.171*** (0.037)	-0.135*** (0.037)
Other Race		-0.073 (0.108)	0.003 (0.112)		0.112 (0.090)	0.061 (0.103)
Special Education		-0.514*** (0.031)	-0.397*** (0.037)		-0.610*** (0.034)	-0.494*** (0.036)
Limited English Proficiency		-0.358*** (0.030)	-0.122** (0.053)		-0.720*** (0.033)	-0.380*** (0.048)
Free or Reduced Lunch		-0.049** (0.021)	-0.065*** (0.022)		-0.025 (0.018)	-0.026 (0.021)
Female X Black or Hispanic		0.013 (0.040)	0.018 (0.050)		0.087*** (0.030)	0.085** (0.036)
Observations	13115	13115	9223	13115	13115	9223
R Squared	0.233	0.302	0.347	0.217	0.344	0.390

Table T.4: Regression Results, Middle Schools

	ELA			Math		
	No Controls (1)	Demographics (2)	Demographics + Baseline Scores (3)	No Controls (4)	Demographics (5)	Demographics + Baseline Scores (6)
Years in Charter	0.133*** (0.019)	0.106*** (0.017)	0.093*** (0.014)	0.163*** (0.028)	0.171*** (0.025)	0.176*** (0.022)
Years in Pilot	-0.050** (0.022)	-0.075*** (0.018)	-0.053*** (0.015)	-0.054 (0.035)	-0.095*** (0.022)	-0.072*** (0.019)
Years in Exam School	0.655*** (0.056)	0.424*** (0.035)	0.159*** (0.018)	0.789*** (0.080)	0.506*** (0.056)	0.195*** (0.036)
Years in Alternative or Special Ed School	-0.461*** (0.073)	-0.229*** (0.061)	-0.192*** (0.048)	-0.354*** (0.053)	-0.134*** (0.047)	-0.083** (0.040)
Baseline Score			0.534*** (0.010)			0.551*** (0.009)
Female		0.147*** (0.034)	0.067** (0.026)		-0.092** (0.039)	-0.04 (0.030)
Black		-0.392*** (0.037)	-0.136*** (0.027)		-0.574*** (0.041)	-0.182*** (0.033)
Hispanic		-0.278*** (0.039)	-0.095*** (0.028)		-0.357*** (0.041)	-0.113*** (0.032)
Asian		-0.011 (0.038)	0.051* (0.030)		0.361*** (0.045)	0.289*** (0.034)
Other Race		-0.274*** (0.097)	-0.041 (0.071)		-0.508*** (0.100)	-0.272*** (0.094)
Special Education		-0.777*** (0.022)	-0.361*** (0.019)		-0.658*** (0.023)	-0.345*** (0.019)
Limited English Proficiency		-0.328*** (0.024)	0.008 (0.018)		-0.204*** (0.023)	0.029 (0.018)
Free or Reduced Lunch		-0.162*** (0.021)	-0.074*** (0.016)		-0.202*** (0.023)	-0.101*** (0.017)
Female X Black or Hispanic		0.06 (0.036)	0.043 (0.029)		0.083** (0.041)	0.063* (0.033)
Observations	24524	24524	23574	28800	28800	27863
R Squared	0.172	0.334	0.534	0.176	0.340	0.563

Notes: Same as Table T.3.

Table T.5: Regression Results, Elementary Schools

	ELA		Math	
	No Controls	Demographics	No Controls	Demographics
	(1)	(2)	(3)	(4)
Years in Charter	0.072*** (0.023)	0.056*** (0.022)	0.008 (0.029)	0.018 (0.027)
Years in Pilot	0.054* (0.032)	0.033 (0.026)	0.048 (0.039)	0.036 (0.034)
Years in Alternative or Special Ed School	-0.222*** (0.081)	-0.116* (0.065)	-0.291*** (0.102)	-0.224*** (0.080)
Female		0.177*** (0.061)		-0.006 (0.062)
Black		-0.489*** (0.054)		-0.629*** (0.056)
Hispanic		-0.510*** (0.059)		-0.546*** (0.061)
Asian		0.036 (0.070)		0.236*** (0.069)
Other Race		-0.725*** (0.187)		-0.581*** (0.147)
Special Education		-0.560*** (0.047)		-0.451*** (0.051)
Limited English Proficiency		-0.073** (0.032)		-0.002 (0.036)
Free or Reduced Lunch		-0.279*** (0.030)		-0.198*** (0.035)
Female X Black or Hispanic		0.015 (0.066)		-0.002 (0.067)
Observations	11599	11599	8885	8885
R Squared	0.026	0.136	0.024	0.139

Notes: Same as Table T.3.

Table T.6: Regression Results by Lottery Status, High Schools

	ELA			Math		
	No Controls	Demographics	Demographics + Baseline Scores	No Controls	Demographics	Demographics + Baseline Scores
	(1)	(2)	(3)	(4)	(5)	(6)
Years in Charter not in Lottery Sample	0.324*** (0.038)	0.230*** (0.029)	0.153*** (0.026)	0.319*** (0.067)	0.279*** (0.058)	0.147*** (0.039)
Years in Charter in Lottery Sample	0.289*** (0.040)	0.247*** (0.032)	0.187*** (0.033)	0.232*** (0.078)	0.235*** (0.073)	0.168*** (0.065)
Years in Pilot not in Lottery Sample	0.214*** (0.026)	0.159*** (0.020)	0.099*** (0.016)	0.146*** (0.032)	0.109*** (0.030)	0.034 (0.025)
Years in Pilot in Lottery Sample	0.265*** (0.022)	0.227*** (0.021)	0.156*** (0.023)	0.249*** (0.042)	0.213*** (0.043)	0.142*** (0.042)
Years in Exam School	0.619*** (0.031)	0.446*** (0.024)	0.237*** (0.023)	0.743*** (0.036)	0.578*** (0.029)	0.223*** (0.024)
Years in Alternative or Special Ed School	-0.270*** (0.040)	-0.096* (0.053)	0.014 (0.045)	-0.208*** (0.043)	-0.032 (0.051)	-0.023 (0.055)
Baseline Score			0.507*** (0.021)			0.621*** (0.015)
Female		0.065** (0.027)	0.005 (0.032)		-0.111*** (0.030)	-0.027 (0.019)
Black		-0.256*** (0.028)	-0.103*** (0.024)		-0.341*** (0.033)	-0.112*** (0.020)
Hispanic		-0.180*** (0.029)	-0.082*** (0.025)		-0.223*** (0.035)	-0.085*** (0.021)
Asian		-0.052 (0.034)	-0.005 (0.029)		0.220*** (0.047)	0.053 (0.033)
Other Race		-0.136 (0.111)	0.023 (0.100)		-0.246** (0.113)	-0.091 (0.089)
Special Education		-0.684*** (0.030)	-0.353*** (0.026)		-0.601*** (0.030)	-0.209*** (0.026)
Limited English Proficiency		-0.520*** (0.031)	-0.016 (0.030)		-0.140*** (0.032)	0.055** (0.024)
Free or Reduced Lunch		-0.050*** (0.017)	-0.018 (0.018)		-0.007 (0.018)	0.012 (0.014)
Female X Black or Hispanic		0.045 (0.028)	0.04 (0.031)		0.067* (0.036)	0.043* (0.025)
Observations	13379	13379	9308	13181	13181	12747
R Squared	0.372	0.485	0.619	0.438	0.514	0.695

Notes: This table reports similar regressions to those in Table T.3. The only difference is that they include separate dummies for pilot and charter schools with and without randomized lotteries. Only schools with randomized lotteries are included in the lottery regressions. Lotteries may not occur if a school accepts students by application (pilot high schools), if a school is undersubscribed, or if a school admits only guaranteed students.

Table T.6: Continued: Regression Results by Lottery Status, High Schools

	Writing Topic Development			Writing Composition		
	No Controls (7)	Demographics (8)	Demographics + Baseline Scores (9)	No Controls (10)	Demographics (11)	Demographics + Baseline Scores (12)
Years in Charter not in Lottery Sample	0.281*** (0.040)	0.214*** (0.037)	0.168*** (0.042)	0.308*** (0.031)	0.207*** (0.029)	0.170*** (0.037)
Years in Charter in Lottery Sample	0.282*** (0.043)	0.243*** (0.038)	0.223*** (0.045)	0.266*** (0.040)	0.207*** (0.037)	0.175*** (0.035)
Years in Pilot not in Lottery Sample	0.172*** (0.033)	0.130*** (0.031)	0.110*** (0.031)	0.180*** (0.028)	0.123*** (0.024)	0.100*** (0.021)
Years in Pilot in Lottery Sample	0.276*** (0.028)	0.260*** (0.026)	0.244*** (0.024)	0.257*** (0.038)	0.222*** (0.032)	0.199*** (0.025)
Years in Exam School	0.501*** (0.036)	0.371*** (0.029)	0.314*** (0.031)	0.448*** (0.022)	0.303*** (0.019)	0.233*** (0.018)
Years in Alternative or Special Ed School	-0.255*** (0.064)	-0.111* (0.059)	-0.088 (0.059)	-0.187** (0.074)	-0.053 (0.065)	-0.085 (0.070)
Baseline Score			0.237*** (0.015)			0.258*** (0.018)
Female		0.187*** (0.037)	0.159*** (0.046)		0.073** (0.031)	0.057 (0.037)
Black		-0.124*** (0.035)	-0.065* (0.039)		-0.181*** (0.028)	-0.096*** (0.028)
Hispanic		-0.088** (0.036)	-0.063 (0.044)		-0.129*** (0.032)	-0.073** (0.034)
Asian		0.045 (0.051)	0.03 (0.060)		-0.169*** (0.037)	-0.132*** (0.037)
Other Race		-0.073 (0.108)	0.003 (0.110)		0.114 (0.090)	0.064 (0.103)
Special Education		-0.514*** (0.031)	-0.396*** (0.037)		-0.610*** (0.034)	-0.493*** (0.036)
Limited English Proficiency		-0.360*** (0.030)	-0.124** (0.053)		-0.720*** (0.033)	-0.381*** (0.048)
Free or Reduced Lunch		-0.051** (0.021)	-0.069*** (0.022)		-0.026 (0.018)	-0.028 (0.021)
Female X Black or Hispanic		0.013 (0.040)	0.019 (0.050)		0.087*** (0.030)	0.085** (0.037)
Observations	13115	13115	9223	13115	13115	9223
R Squared	0.234	0.304	0.349	0.217	0.345	0.391

Table T.7: Regression Results, Middle Schools

	ELA			Math		
	No Controls (1)	Demographics (2)	Demographics + Baseline Scores (3)	No Controls (4)	Demographics (5)	Demographics + Baseline Scores (6)
Years in Charter not in Lottery Sample	0.102*** (0.021)	0.083*** (0.019)	0.075*** (0.015)	0.096*** (0.029)	0.114*** (0.027)	0.130*** (0.024)
Years in Charter in Lottery Sample	0.252*** (0.021)	0.200*** (0.021)	0.164*** (0.017)	0.414*** (0.040)	0.385*** (0.045)	0.356*** (0.042)
Years in Pilot not in Lottery Sample	0.003 (0.031)	-0.019 (0.028)	-0.014 (0.025)	0.017 (0.049)	-0.008 (0.034)	0.023 (0.033)
Years in Pilot in Lottery Sample	-0.058* (0.030)	-0.080*** (0.025)	-0.050** (0.020)	-0.072* (0.043)	-0.114*** (0.027)	-0.101*** (0.020)
Years in Exam School	0.658*** (0.056)	0.430*** (0.035)	0.164*** (0.018)	0.795*** (0.081)	0.515*** (0.057)	0.205*** (0.037)
Years in Alternative or Special Ed School	-0.457*** (0.073)	-0.225*** (0.061)	-0.189*** (0.048)	-0.350*** (0.054)	-0.131*** (0.048)	-0.080** (0.040)
Baseline Score			0.533*** (0.010)			0.548*** (0.009)
Female		0.146*** (0.034)	0.067** (0.027)		-0.093** (0.039)	-0.04 (0.031)
Black		-0.382*** (0.037)	-0.129*** (0.027)		-0.550*** (0.042)	-0.165*** (0.033)
Hispanic		-0.266*** (0.039)	-0.087*** (0.029)		-0.332*** (0.042)	-0.094*** (0.032)
Asian		-0.005 (0.039)	0.054* (0.030)		0.380*** (0.045)	0.306*** (0.034)
Other Race		-0.275*** (0.097)	-0.042 (0.070)		-0.498*** (0.099)	-0.268*** (0.093)
Special Education		-0.775*** (0.022)	-0.360*** (0.019)		-0.657*** (0.023)	-0.344*** (0.019)
Limited English Proficiency		-0.329*** (0.024)	0.007 (0.018)		-0.206*** (0.023)	0.026 (0.018)
Free or Reduced Lunch		-0.161*** (0.021)	-0.074*** (0.016)		-0.202*** (0.022)	-0.101*** (0.017)
Female X Black or Hispanic		0.061* (0.036)	0.043 (0.029)		0.084** (0.041)	0.065* (0.034)
Observations	24524	24524	23574	28800	28800	27863
R Squared	0.175	0.335	0.534	0.187	0.347	0.569

Notes: This table reports similar regressions to those in Table T.4. The only difference is that they include separate dummies for pilot and charter schools with and without randomized lotteries. Only schools with randomized lotteries are included in the lottery regressions. Lotteries may not occur if a school accepts students by application (pilot high schools), if a school is undersubscribed, or if a school admits only guaranteed students.

Table T.8: Lottery Results, Charter High Schools: ELA

	No Controls			Demographics			Demographics + Baseline Scores		
	Reduced Form	First Stage	2SLS	Reduced Form	First Stage	2SLS	Reduced Form	First Stage	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Years in Charter School	0.088*	0.573***	0.153*	0.097**	0.574***	0.170**	0.094**	0.573***	0.164**
	(0.053)	(0.133)	(0.089)	(0.046)	(0.132)	(0.077)	(0.041)	(0.138)	(0.073)
Baseline							0.462***	-0.066*	0.473***
							(0.038)	(0.038)	(0.037)
Female				-0.03	0.153	-0.056	-0.058	0.277*	-0.103
				(0.168)	(0.132)	(0.171)	(0.153)	(0.147)	(0.157)
Black				-0.359***	0.518***	-0.447***	-0.134	0.641***	-0.239**
				(0.116)	(0.129)	(0.130)	(0.094)	(0.146)	(0.113)
Hispanic				-0.252**	0.429***	-0.325***	-0.08	0.526***	-0.167
				(0.111)	(0.119)	(0.120)	(0.090)	(0.130)	(0.102)
Asian				-0.12	0.356***	-0.181	0.014	0.498***	-0.068
u				(0.138)	(0.135)	(0.147)	(0.119)	(0.164)	(0.131)
Other Race				-0.046	0.06	-0.056	0.324	0.109	0.306
				(0.224)	(0.248)	(0.220)	(0.209)	(0.278)	(0.201)
Special Education				-0.711***	0.133**	-0.733***	-0.425***	0.036	-0.431***
				(0.069)	(0.063)	(0.068)	(0.060)	(0.068)	(0.057)
Limited English Proficiency				-0.065	0.071	-0.077	0.124	-0.091	0.139
				(0.101)	(0.131)	(0.101)	(0.170)	(0.156)	(0.177)
Free or Reduced Lunch				-0.124***	-0.063	-0.113***	-0.086**	-0.057	-0.077**
				(0.042)	(0.046)	(0.040)	(0.039)	(0.051)	(0.036)
Female X Black or Hispanic				0.181	-0.163	0.209	0.095	-0.336**	0.151
				(0.165)	(0.137)	(0.169)	(0.149)	(0.150)	(0.154)
Observations	1472	1472	1472	1472	1472	1472	1170	1170	1170
R Squared	0.089	0.141	-0.015	0.253	0.157	0.174	0.436	0.168	0.386

Notes: This table reports the coefficients on regressions using years spent in charter schools. Sample restricted to students with baseline demographic characteristics. Demographics include female, black, hispanic, asian, other race, special education, limited english proficiency, free/reduced price lunch, and a female*minority dummy. Regressions also include year of test and year of birth dummies. Middle school and elementary school regressions pool grade outcomes and include dummies for grade level. All charter regressions also include for combination of schools applied to*year of application and exclude students with sibling priority. Regressions use robust standard errors and are clustered on year by 10th grade school for high school and student identifier as well as school by year for pooled regressions.

Table T.9: Lottery Results, Charter High Schools: Math

	No Controls			Demographics			Demographics + Baseline Scores		
	Reduced Form	First Stage	2SLS	Reduced Form	First Stage	2SLS	Reduced Form	First Stage	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Years in Charter School	0.142** (0.061)	0.574*** (0.132)	0.247** (0.102)	0.119** (0.058)	0.576*** (0.131)	0.207** (0.093)	0.109** (0.052)	0.582*** (0.132)	0.187** (0.083)
Baseline							0.601*** (0.025)	-0.105*** (0.036)	0.621*** (0.025)
Female				-0.175 (0.207)	0.16 (0.135)	-0.208 (0.206)	-0.072 (0.138)	0.161 (0.135)	-0.102 (0.128)
Black				-0.670*** (0.160)	0.524*** (0.130)	-0.778*** (0.171)	-0.301*** (0.101)	0.467*** (0.123)	-0.389*** (0.103)
Hispanic				-0.542*** (0.159)	0.432*** (0.118)	-0.631*** (0.166)	-0.240** (0.103)	0.386*** (0.114)	-0.313*** (0.100)
Asian				0.081 (0.174)	0.374*** (0.134)	0.004 (0.185)	-0.001 (0.116)	0.412*** (0.129)	-0.078 (0.121)
Other Race				-1.087*** (0.303)	0.107 (0.272)	-1.109*** (0.298)	-0.494** (0.225)	-0.02 (0.288)	-0.490** (0.225)
Special Education				-0.606*** (0.074)	0.152** (0.062)	-0.638*** (0.071)	-0.214*** (0.054)	0.078 (0.056)	-0.229*** (0.052)
Limited English Proficiency				0.08 (0.102)	0.062 (0.129)	0.067 (0.106)	0.194** (0.082)	0.039 (0.125)	0.187** (0.083)
Free or Reduced Lunch				-0.047 (0.044)	-0.06 (0.047)	-0.035 (0.044)	0.008 (0.034)	-0.061 (0.048)	0.019 (0.032)
Female X Black or Hispanic				0.194 (0.211)	-0.166 (0.140)	0.228 (0.212)	0.081 (0.140)	-0.173 (0.139)	0.113 (0.130)
Observations	1462	1462	1462	1462	1462	1462	1428	1428	1428
R Squared	0.097	0.141	-0.044	0.222	0.157	0.129	0.536	0.161	0.503

Notes: Same as Table T.8.

Table T.10: Lottery Results, Charter High Schools: Writing Topic Development

	No Controls			Demographics			Demographics + Baseline Scores		
	Reduced Form	First Stage	2SLS	Reduced Form	First Stage	2SLS	Reduced Form	First Stage	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Years in Charter School	0.141**	0.575***	0.245**	0.150**	0.576***	0.260**	0.161**	0.567***	0.283**
	(0.064)	(0.133)	(0.120)	(0.060)	(0.132)	(0.114)	(0.063)	(0.138)	(0.126)
Baseline							0.227***	-0.075**	0.249***
							(0.040)	(0.031)	(0.041)
Female				0.26	0.156	0.219	0.306	0.290*	0.224
				(0.160)	(0.132)	(0.162)	(0.197)	(0.151)	(0.204)
Black				-0.121	0.526***	-0.258*	-0.059	0.665***	-0.248
				(0.138)	(0.129)	(0.152)	(0.180)	(0.152)	(0.209)
Hispanic				-0.055	0.432***	-0.167	-0.009	0.541***	-0.162
				(0.126)	(0.120)	(0.134)	(0.166)	(0.133)	(0.181)
Asian				0.118	0.354***	0.026	0.194	0.497***	0.053
				(0.157)	(0.135)	(0.163)	(0.191)	(0.164)	(0.205)
Other Race				-0.053	0.04	-0.064	0.057	0.105	0.027
				(0.288)	(0.255)	(0.301)	(0.329)	(0.294)	(0.352)
Special Education				-0.521***	0.143**	-0.558***	-0.427***	0.047	-0.441***
				(0.090)	(0.063)	(0.091)	(0.093)	(0.073)	(0.093)
Limited English Proficiency				-0.109	0.068	-0.127	-0.082	-0.043	-0.07
				(0.132)	(0.130)	(0.130)	(0.220)	(0.144)	(0.225)
Free or Reduced Lunch				-0.076*	-0.066	-0.059	-0.06	-0.061	-0.043
				(0.046)	(0.046)	(0.044)	(0.050)	(0.051)	(0.048)
Female X Black or Hispanic				-0.066	-0.165	-0.023	-0.167	-0.340**	-0.071
				(0.158)	(0.138)	(0.157)	(0.191)	(0.152)	(0.194)
Observations	1458	1458	1458	1458	1458	1458	1159	1159	1159
R Squared	0.057	0.142	-0.029	0.142	0.159	0.066	0.185	0.169	0.109

Notes: Same as Table T.8.

Table T.11: Lottery Results, Charter High Schools: Writing Composition

	No Controls			Demographics			Demographics + Baseline Scores		
	Reduced Form	First Stage	2SLS	Reduced Form	First Stage	2SLS	Reduced Form	First Stage	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Years in Charter School	0.092	0.575***	0.160*	0.106*	0.576***	0.184**	0.075	0.577***	0.129
	(0.056)	(0.133)	(0.093)	(0.054)	(0.132)	(0.090)	(0.056)	(0.137)	(0.091)
Baseline							0.265***	-0.082**	0.275***
							(0.044)	(0.041)	(0.041)
Female				0.265	0.156	0.237	0.24	0.296**	0.201
				(0.167)	(0.132)	(0.167)	(0.200)	(0.150)	(0.200)
Black				-0.182	0.526***	-0.279*	-0.114	0.671***	-0.201
				(0.149)	(0.129)	(0.154)	(0.183)	(0.152)	(0.191)
Hispanic				-0.087	0.432***	-0.166	-0.034	0.549***	-0.105
				(0.148)	(0.120)	(0.147)	(0.178)	(0.134)	(0.178)
Asian				-0.067	0.354***	-0.132	-0.058	0.505***	-0.124
				(0.169)	(0.135)	(0.172)	(0.201)	(0.163)	(0.204)
Other Race				-0.055	0.04	-0.063	0.03	0.112	0.015
				(0.252)	(0.255)	(0.250)	(0.310)	(0.293)	(0.308)
Special Education				-0.545***	0.143**	-0.572***	-0.429***	0.048	-0.435***
				(0.079)	(0.063)	(0.079)	(0.077)	(0.074)	(0.076)
Limited English Proficiency				-0.178	0.068	-0.191	-0.14	-0.072	-0.131
				(0.143)	(0.130)	(0.135)	(0.257)	(0.149)	(0.255)
Free or Reduced Lunch				-0.04	-0.066	-0.028	-0.029	-0.061	-0.021
				(0.046)	(0.046)	(0.044)	(0.050)	(0.052)	(0.047)
Female X Black or Hispanic				-0.068	-0.165	-0.038	-0.097	-0.350**	-0.052
				(0.167)	(0.138)	(0.165)	(0.198)	(0.153)	(0.197)
Observations	1458	1458	1458	1458	1458	1458	1159	1159	1159
R Squared	0.063	0.142	-0.008	0.156	0.159	0.096	0.207	0.169	0.155

Notes: Same as Table T.8.

Table T.12: Lottery Results, Charter Middle Schools: ELA

	No Controls			Demographics			Demographics + Baseline Scores		
	Reduced Form (1)	First Stage (2)	2SLS (3)	Reduced Form (4)	First Stage (5)	2SLS (6)	Reduced Form (7)	First Stage (8)	2SLS (9)
Years in Charter School	0.184** (0.073)	0.957*** (0.134)	0.192*** (0.071)	0.140** (0.065)	0.955*** (0.128)	0.147** (0.060)	0.158*** (0.058)	0.959*** (0.128)	0.165*** (0.051)
Baseline							0.473*** (0.040)	-0.048 (0.050)	0.481*** (0.039)
Female				0.101 (0.085)	-0.025 (0.199)	0.105 (0.082)	0.033 (0.075)	-0.061 (0.196)	0.043 (0.076)
Black				-0.477*** (0.083)	0.484*** (0.180)	-0.548*** (0.083)	-0.196** (0.086)	0.458** (0.188)	-0.272*** (0.087)
Hispanic				-0.250*** (0.086)	0.3 (0.186)	-0.294*** (0.086)	-0.122 (0.088)	0.26 (0.191)	-0.164* (0.089)
Asian				-0.12 (0.149)	-0.723*** (0.259)	-0.014 (0.156)	-0.126 (0.122)	-0.725*** (0.264)	-0.007 (0.127)
Other Race				-0.181 (0.354)	0.737 (0.462)	-0.289 (0.333)	0.241 (0.234)	0.722 (0.479)	0.122 (0.203)
Special Education				-0.701*** (0.069)	0.038 (0.100)	-0.706*** (0.065)	-0.419*** (0.069)	0.009 (0.102)	-0.421*** (0.067)
Limited English Proficiency				-0.178* (0.094)	0.181 (0.149)	-0.204** (0.089)	0.119 (0.095)	0.172 (0.158)	0.091 (0.091)
Free or Reduced Lunch				-0.104** (0.049)	-0.077 (0.075)	-0.093* (0.048)	0.009 (0.041)	-0.042 (0.074)	0.016 (0.040)
Female X Black or Hispanic				0.144 (0.101)	0.135 (0.207)	0.124 (0.095)	0.126 (0.087)	0.185 (0.207)	0.096 (0.086)
Observations	1461	1461	1461	1461	1461	1461	1426	1426	1426
R Squared	0.115	0.282	0.000	0.283	0.327	0.217	0.445	0.334	0.398

Notes: Same as Table T.8.

Table T.13: Lottery Results, Charter Middle Schools: Math

	No Controls			Demographics			Demographics + Baseline Scores		
	Reduced Form (1)	First Stage (2)	2SLS (3)	Reduced Form (4)	First Stage (5)	2SLS (6)	Reduced Form (7)	First Stage (8)	2SLS (9)
Years in Charter School	0.488*** (0.082)	0.872*** (0.122)	0.560*** (0.099)	0.461*** (0.078)	0.877*** (0.117)	0.526*** (0.088)	0.464*** (0.069)	0.883*** (0.118)	0.525*** (0.076)
Baseline							0.516*** (0.035)	-0.054 (0.046)	0.544*** (0.036)
Female				-0.17 (0.113)	-0.069 (0.184)	-0.134 (0.130)	-0.08 (0.094)	-0.125 (0.184)	-0.014 (0.120)
Black				-0.450*** (0.101)	0.426** (0.169)	-0.675*** (0.123)	-0.058 (0.098)	0.365** (0.177)	-0.250** (0.121)
Hispanic				-0.068 (0.114)	0.245 (0.175)	-0.197 (0.132)	0.07 (0.106)	0.202 (0.182)	-0.036 (0.126)
Asian				0.293* (0.164)	-0.728*** (0.242)	0.676*** (0.227)	0.114 (0.166)	-0.728*** (0.243)	0.497** (0.208)
Other Race				-0.462 (0.560)	0.545 (0.409)	-0.748 (0.539)	-0.161 (0.335)	0.529 (0.425)	-0.439 (0.303)
Special Education				-0.680*** (0.074)	0.054 (0.094)	-0.709*** (0.076)	-0.399*** (0.071)	0.026 (0.097)	-0.413*** (0.078)
Limited English Proficiency				-0.016 (0.114)	0.142 (0.132)	-0.091 (0.119)	0.162 (0.118)	0.133 (0.135)	0.092 (0.114)
Free or Reduced Lunch				-0.163*** (0.062)	-0.084 (0.071)	-0.119* (0.068)	0.004 (0.049)	-0.068 (0.070)	0.04 (0.051)
Female X Black or Hispanic				0.207 (0.129)	0.167 (0.192)	0.119 (0.140)	0.16 (0.105)	0.224 (0.193)	0.043 (0.127)
Observations	1627	1627	1627	1627	1627	1627	1587	1587	1587
R Squared	0.170	0.286	-0.150	0.293	0.329	0.098	0.489	0.331	0.338

Notes: Same as Table T.8.

Table T.14: Lottery Results, Pilot High Schools: ELA

	No Controls			Demographics			Demographics + Baseline Scores		
	Reduced Form	First Stage	2SLS	Reduced Form	First Stage	2SLS	Reduced Form	First Stage	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Years in Pilot School	-0.002 (0.052)	0.619*** (0.104)	-0.004 (0.083)	-0.003 (0.054)	0.608*** (0.104)	-0.005 (0.087)	-0.036 (0.046)	0.617*** (0.110)	-0.058 (0.074)
Baseline							0.489*** (0.040)	-0.062 (0.062)	0.486*** (0.038)
Female				-0.132 (0.117)	-0.129 (0.159)	-0.133 (0.115)	-0.197 (0.132)	-0.138 (0.166)	-0.205 (0.130)
Black				-0.441*** (0.093)	0.044 (0.132)	-0.441*** (0.091)	-0.219** (0.085)	0.087 (0.126)	-0.214*** (0.082)
Hispanic				-0.253*** (0.086)	0.304** (0.142)	-0.252*** (0.088)	-0.168** (0.085)	0.374*** (0.141)	-0.146* (0.086)
Asian				-0.131 (0.106)	-0.11 (0.192)	-0.132 (0.104)	-0.039 (0.100)	-0.095 (0.193)	-0.044 (0.100)
Other Race				-0.131 (0.104)	-0.303* (0.180)	-0.133 (0.105)	0.128 (0.241)	-0.293 (0.179)	0.111 (0.232)
Special Education				-0.578*** (0.120)	0.08 (0.120)	-0.578*** (0.115)	-0.304*** (0.116)	0.04 (0.118)	-0.302*** (0.112)
Limited English Proficiency				-0.017 (0.132)	-0.091 (0.164)	-0.018 (0.128)	0.275*** (0.096)	-0.163 (0.198)	0.265*** (0.091)
Free or Reduced Lunch				-0.226*** (0.051)	0.083 (0.083)	-0.225*** (0.049)	-0.189*** (0.046)	0.1 (0.091)	-0.183*** (0.042)
Female X Black or Hispanic				0.210* (0.124)	0.03 (0.168)	0.210* (0.121)	0.197 (0.130)	0.04 (0.170)	0.199 (0.126)
Observations	676	676	676	676	676	676	636	636	636
R Squared	0.092	0.170	0.000	0.221	0.191	0.143	0.422	0.201	0.357

Notes: This table reports the coefficients on regressions using years spent in pilot schools. Sample restricted to students with baseline demographic characteristics. Demographics include female, black, hispanic, asian, other race, special education, limited english proficiency, free/reduced price lunch, and a female*minority dummy. Regressions also include year of test and year of birth dummies. Middle school and elementary school regressions pool grade outcomes and include dummies for grade level. All pilot regressions also include dummies for walk zone*first choice*year of application and exclude students with sibling priority. Regressions use robust standard errors and are clustered on year by 10th grade school for high school and student identifier as well as school by year for pooled regressions.

Table T.15: Lottery Results, Pilot High Schools: Math

	No Controls			Demographics			Demographics + Baseline Scores		
	Reduced Form	First Stage	2SLS	Reduced Form	First Stage	2SLS	Reduced Form	First Stage	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Years in Pilot School	-0.087	0.604***	-0.145	-0.105	0.595***	-0.176	-0.055	0.583***	-0.094
	(0.075)	(0.104)	(0.123)	(0.074)	(0.104)	(0.128)	(0.051)	(0.110)	(0.091)
Baseline							0.627***	-0.112**	0.617***
							(0.030)	(0.051)	(0.032)
Female				-0.412**	-0.144	-0.438**	-0.216*	-0.336**	-0.248*
				(0.194)	(0.161)	(0.197)	(0.124)	(0.168)	(0.134)
Black				-0.582***	0.046	-0.574***	-0.154*	-0.022	-0.156**
				(0.125)	(0.133)	(0.118)	(0.080)	(0.122)	(0.078)
Hispanic				-0.405***	0.279*	-0.356**	-0.102	0.221	-0.081
				(0.132)	(0.144)	(0.141)	(0.088)	(0.140)	(0.090)
Asian				0.281**	-0.113	0.261**	0.225**	-0.106	0.215***
				(0.122)	(0.189)	(0.121)	(0.088)	(0.194)	(0.083)
Other Race				-0.027	-0.308*	-0.082	0.207	-0.346*	0.174
				(0.302)	(0.183)	(0.314)	(0.194)	(0.200)	(0.202)
Special Education				-0.612***	0.092	-0.595***	-0.210**	0.013	-0.209***
				(0.105)	(0.122)	(0.097)	(0.082)	(0.121)	(0.079)
Limited English Proficiency				0.274**	-0.094	0.258**	0.270***	-0.101	0.260***
				(0.126)	(0.164)	(0.131)	(0.076)	(0.168)	(0.078)
Free or Reduced Lunch				-0.079	0.077	-0.066	-0.03	0.089	-0.021
				(0.064)	(0.086)	(0.064)	(0.045)	(0.089)	(0.044)
Female X Black or Hispanic				0.248	0.04	0.255	0.124	0.214	0.144
				(0.197)	(0.170)	(0.194)	(0.124)	(0.177)	(0.127)
Observations	671	671	671	671	671	671	659	659	659
R Squared	0.074	0.163	-0.004	0.245	0.182	0.165	0.593	0.194	0.549

Notes: Same as Table T.14.

Table T.16: Lottery Results, Pilot High Schools: Writing Topic Development

	No Controls			Demographics			Demographics + Baseline Scores		
	Reduced Form	First Stage	2SLS	Reduced Form	First Stage	2SLS	Reduced Form	First Stage	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Years in Pilot School	0.082	0.612***	0.135	0.08	0.602***	0.134	0.09	0.597***	0.152
	(0.071)	(0.104)	(0.112)	(0.076)	(0.105)	(0.121)	(0.073)	(0.110)	(0.118)
Baseline							0.180***	-0.023	0.183***
							(0.048)	(0.062)	(0.048)
Female				0.193	-0.174	0.216	0.123	-0.187	0.151
				(0.148)	(0.165)	(0.147)	(0.165)	(0.174)	(0.165)
Black				-0.305*	0.024	-0.308*	-0.291*	0.085	-0.303*
				(0.160)	(0.135)	(0.158)	(0.174)	(0.138)	(0.172)
Hispanic				-0.144	0.281*	-0.182	-0.181	0.362**	-0.236*
				(0.117)	(0.144)	(0.117)	(0.137)	(0.146)	(0.141)
Asian				-0.056	-0.131	-0.038	-0.05	-0.12	-0.031
				(0.126)	(0.193)	(0.132)	(0.135)	(0.198)	(0.141)
Other Race				-0.066	-0.327*	-0.023	-0.09	-0.285	-0.047
				(0.201)	(0.181)	(0.200)	(0.174)	(0.183)	(0.172)
Special Education				-0.442***	0.07	-0.452***	-0.375***	0.065	-0.385***
				(0.088)	(0.124)	(0.089)	(0.079)	(0.118)	(0.077)
Limited English Proficiency				0.119	-0.093	0.131	0.238	-0.182	0.266*
				(0.135)	(0.163)	(0.134)	(0.150)	(0.190)	(0.153)
Free or Reduced Lunch				-0.134**	0.08	-0.145**	-0.133**	0.109	-0.149**
				(0.066)	(0.083)	(0.068)	(0.059)	(0.090)	(0.064)
Female X Black or Hispanic				0.015	0.08	0.005	0.046	0.093	0.032
				(0.171)	(0.173)	(0.168)	(0.188)	(0.177)	(0.190)
Observations	669	669	669	669	669	669	628	628	628
R Squared	0.075	0.170	-0.019	0.147	0.191	0.064	0.168	0.198	0.084

Notes: Same as Table T.14.

Table T.17: Lottery Results, Pilot High Schools: Writing Composition

	No Controls			Demographics			Demographics + Baseline Scores		
	Reduced Form	First Stage	2SLS	Reduced Form	First Stage	2SLS	Reduced Form	First Stage	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Years in Pilot School	0.058	0.612***	0.095	0.056	0.602***	0.094	0.058	0.596***	0.097
	(0.066)	(0.104)	(0.103)	(0.072)	(0.105)	(0.115)	(0.063)	(0.110)	(0.101)
Baseline							0.263***	0.013	0.262***
							(0.050)	(0.048)	(0.048)
Female				0.1	-0.174	0.117	0.045	-0.198	0.064
				(0.128)	(0.165)	(0.128)	(0.144)	(0.175)	(0.143)
Black				-0.366***	0.024	-0.368***	-0.364***	0.083	-0.373***
				(0.117)	(0.135)	(0.114)	(0.112)	(0.136)	(0.108)
Hispanic				-0.215*	0.281*	-0.241**	-0.256*	0.355**	-0.291**
				(0.122)	(0.144)	(0.118)	(0.139)	(0.145)	(0.138)
Asian				-0.16	-0.131	-0.148	-0.2	-0.127	-0.188
				(0.134)	(0.193)	(0.142)	(0.134)	(0.198)	(0.139)
Other Race				-0.111	-0.327*	-0.081	-0.124	-0.291	-0.096
				(0.160)	(0.181)	(0.171)	(0.211)	(0.178)	(0.212)
Special Education				-0.480***	0.07	-0.487***	-0.380***	0.086	-0.388***
				(0.105)	(0.124)	(0.103)	(0.106)	(0.119)	(0.103)
Limited English Proficiency				-0.18	-0.093	-0.172	-0.007	-0.175	0.009
				(0.173)	(0.163)	(0.170)	(0.141)	(0.192)	(0.137)
Free or Reduced Lunch				-0.159**	0.08	-0.167**	-0.125*	0.114	-0.136**
				(0.067)	(0.083)	(0.068)	(0.065)	(0.090)	(0.066)
Female X Black or Hispanic				0.116	0.08	0.109	0.148	0.1	0.139
				(0.143)	(0.173)	(0.142)	(0.158)	(0.178)	(0.157)
Observations	669	669	669	669	669	669	628	628	628
R Squared	0.067	0.170	-0.005	0.158	0.191	0.097	0.222	0.198	0.159

Notes: Same as Table T.14.

Table T.18: Lottery Results, Pilot Middle Schools: ELA

	No Controls			Demographics			Demographics + Baseline Scores		
	Reduced Form (1)	First Stage (2)	2SLS (3)	Reduced Form (4)	First Stage (5)	2SLS (6)	Reduced Form (7)	First Stage (8)	2SLS (9)
Years in Pilot School	0.025 (0.082)	1.005*** (0.178)	0.024 (0.081)	-0.005 (0.074)	1.032*** (0.180)	-0.005 (0.070)	0.022 (0.072)	1.051*** (0.183)	0.021 (0.068)
Baseline							0.502*** (0.035)	-0.063* (0.035)	0.504*** (0.034)
Female				0.233** (0.094)	-0.211 (0.331)	0.232** (0.093)	0.139 (0.099)	-0.199 (0.332)	0.143 (0.098)
Black				-0.500*** (0.110)	0.225 (0.304)	-0.499*** (0.109)	-0.371*** (0.110)	0.214 (0.307)	-0.375*** (0.110)
Hispanic				-0.285*** (0.104)	0.354 (0.313)	-0.283*** (0.107)	-0.208* (0.107)	0.353 (0.316)	-0.215* (0.111)
Asian				0.031 (0.135)	0.452 (0.372)	0.033 (0.136)	0.047 (0.123)	0.462 (0.375)	0.038 (0.125)
Other Race				-0.389 (0.427)	0.263 (0.305)	-0.388 (0.412)	-0.212 (0.296)	0.267 (0.307)	-0.217 (0.285)
Special Education				-0.645*** (0.083)	0.113 (0.092)	-0.644*** (0.081)	-0.394*** (0.078)	0.071 (0.094)	-0.395*** (0.077)
Limited English Proficiency				-0.449*** (0.072)	0.099 (0.100)	-0.448*** (0.070)	-0.019 (0.061)	0.024 (0.100)	-0.019 (0.060)
Free or Reduced Lunch				-0.367*** (0.059)	0.15 (0.143)	-0.366*** (0.058)	-0.353*** (0.051)	0.171 (0.145)	-0.357*** (0.051)
Female X Black or Hispanic				-0.067 (0.103)	0.235 (0.339)	-0.066 (0.102)	-0.029 (0.102)	0.207 (0.340)	-0.034 (0.101)
Observations	2025	2025	2025	2025	2025	2025	1971	1971	1971
R Squared	0.192	0.466	-0.008	0.329	0.473	0.170	0.483	0.476	0.355

Notes: Same as Table T.14.

Table T.19: Lottery Results, Pilot Middle Schools: Math

	No Controls			Demographics			Demographics + Baseline Scores		
	Reduced Form (1)	First Stage (2)	2SLS (3)	Reduced Form (4)	First Stage (5)	2SLS (6)	Reduced Form (7)	First Stage (8)	2SLS (9)
Years in Pilot School	-0.122 (0.089)	0.905*** (0.178)	-0.134 (0.095)	-0.130* (0.078)	0.934*** (0.179)	-0.139* (0.081)	-0.103 (0.069)	0.949*** (0.182)	-0.109 (0.070)
Baseline							0.520*** (0.027)	-0.041 (0.030)	0.516*** (0.025)
Female				-0.011 (0.114)	-0.23 (0.306)	-0.043 (0.115)	-0.007 (0.118)	-0.231 (0.306)	-0.032 (0.115)
Black				-0.587*** (0.109)	0.192 (0.285)	-0.560*** (0.110)	-0.416*** (0.114)	0.182 (0.287)	-0.396*** (0.112)
Hispanic				-0.338*** (0.109)	0.32 (0.294)	-0.294*** (0.110)	-0.277** (0.114)	0.323 (0.296)	-0.242** (0.113)
Asian				0.295** (0.129)	0.316 (0.329)	0.339*** (0.129)	0.200* (0.121)	0.319 (0.331)	0.235** (0.119)
Other Race				-0.571 (0.376)	0.242 (0.289)	-0.538 (0.366)	-0.462 (0.300)	0.253 (0.295)	-0.435 (0.291)
Special Education				-0.513*** (0.071)	0.121 (0.083)	-0.496*** (0.069)	-0.352*** (0.076)	0.108 (0.086)	-0.340*** (0.074)
Limited English Proficiency				-0.194** (0.075)	0.103 (0.093)	-0.179** (0.071)	0.023 (0.061)	0.077 (0.094)	0.031 (0.058)
Free or Reduced Lunch				-0.388*** (0.062)	0.092 (0.131)	-0.375*** (0.062)	-0.356*** (0.056)	0.109 (0.132)	-0.344*** (0.056)
Female X Black or Hispanic				-0.008 (0.123)	0.281 (0.315)	0.031 (0.127)	0.023 (0.122)	0.27 (0.316)	0.053 (0.120)
Observations	2368	2368	2368	2368	2368	2368	2321	2321	2321
R Squared	0.253	0.501	0.018	0.357	0.508	0.149	0.516	0.509	0.361

Notes: Same as Table T.14.

Table T.20: Lottery Results, Pilot Elementary Schools: ELA

	No Controls			Demographics		
	Reduced Form (1)	First Stage (2)	2SLS (3)	Reduced Form (4)	First Stage (5)	2SLS (6)
Years in Pilot School	0.275*** (0.101)	2.697*** (0.257)	0.102*** (0.037)	0.252*** (0.087)	2.685*** (0.258)	0.094*** (0.032)
Female				0.304 (0.189)	0.008 (0.417)	0.304* (0.168)
Black				-0.396** (0.187)	-0.710* (0.375)	-0.329* (0.183)
Hispanic				-0.476** (0.194)	-0.285 (0.434)	-0.450** (0.190)
Asian				-0.011 (0.199)	-0.402 (0.476)	0.026 (0.197)
Other Race				-0.481 (0.541)	0.054 (0.498)	-0.486 (0.520)
Special Education				-0.278 (0.254)	-0.512** (0.224)	-0.23 (0.244)
Limited English Proficiency				0.266* (0.150)	0.619 (0.521)	0.208 (0.150)
Free or Reduced Lunch				-0.242** (0.099)	0.133 (0.174)	-0.255*** (0.094)
Female X Black or Hispanic				-0.019 (0.226)	0.07 (0.451)	-0.025 (0.205)
Observations	442	442	442	442	442	442
R Squared	0.176	0.533	0.022	0.257	0.557	0.113

Notes: Same as Table T.14.

Table T.21: Lottery Results, Pilot Elementary Schools: Math

	No Controls			Demographics		
	Reduced Form (1)	First Stage (2)	2SLS (3)	Reduced Form (4)	First Stage (5)	2SLS (6)
Years in Pilot School	0.158 (0.100)	2.712*** (0.256)	0.058 (0.036)	0.139 (0.095)	2.702*** (0.254)	0.051 (0.034)
Female				0.103 (0.193)	0.016 (0.426)	0.102 (0.177)
Black				-0.469*** (0.171)	-0.709* (0.376)	-0.433*** (0.164)
Hispanic				-0.340* (0.188)	-0.312 (0.436)	-0.324* (0.180)
Asian				0.24 (0.200)	-0.404 (0.477)	0.261 (0.197)
Other Race				-0.471 (0.382)	0.047 (0.498)	-0.473 (0.369)
Special Education				-0.29 (0.225)	-0.511** (0.221)	-0.263 (0.215)
Limited English Proficiency				0.177 (0.171)	0.647 (0.526)	0.144 (0.157)
Free or Reduced Lunch				-0.173 (0.107)	0.136 (0.174)	-0.180* (0.102)
Female X Black or Hispanic				-0.213 (0.228)	0.076 (0.458)	-0.217 (0.210)
Observations	443	443	443	443	443	443
R Squared	0.140	0.534	0.018	0.204	0.559	0.087

Notes: Same as Table T.14.