

January 2014

Staying or Going?

Comparing Student Attrition Rates at Charter Schools with Nearby Traditional Public Schools

Summary

One of the major issues in the debate over the expansion of charter schools in New York City has been the question of whether students transfer out of charter schools at higher rates than at traditional public schools. Researchers have found that changing schools can affect achievement and that for minority and disadvantaged students who change schools frequently it may be a contributor to the achievement gap.

To assess whether elementary grade students in charter schools leave their schools any more frequently than students in traditional public schools, IBO examined a cohort of students who entered kindergarten in September 2008 and followed them through third grade. This involved tracking data on 3,043 students in 53 charter schools and 7,208 students in 116 traditional public schools nearest to each charter.

We compared the rate at which charter school students in this cohort left their kindergarten school with the rate at which those in the same cohort in neighboring traditional public elementary schools left their schools. In addition to comparing the overall rates for the schools, we also consider any differences in rates based on such student characteristics as gender and race/ethnicity as well as poverty, special education, or English language learner status. Among our findings:

- On average, students at charter schools stay at their schools at a higher rate than students at nearby traditional public schools. About 70 percent of students attending charter schools in school year 2008-2009 remained in the same school three years later, compared with 61 percent of students attending nearby traditional public schools three years later.
- This higher rate of staying at charter schools also is found when students are compared in terms of gender, race/ethnicity, poverty, and English learner status.
- The one major exception is special education students, who leave charter schools at a much higher rate than either general education students in charter schools or special education students in traditional public schools. Only 20 percent of students classified as requiring special education services who started kindergarten in charter schools remained in the same school after three years.

We also found that for both charter school and traditional public school students, those who stayed in the same school from kindergarten through third grade did better on standardized math and reading tests in third grade than students from the cohort who switched schools. The achievement gap between stayers and movers was considerably larger for those who left charter schools and the gap was larger in math than reading.

How likely are students to leave New York City’s charter schools? This schools brief compares attrition rates for students attending charter schools in early elementary grades to those of students attending *nearby* traditional public schools. Our analysis includes all students enrolled at charter schools in kindergarten in school year 2008-2009, creates a comparison sample of students attending neighboring traditional public schools, and follows both groups of students over the next three years. This allows us to compare the students who move out of charter schools to students who continue at their original charter schools and to students in neighboring traditional public schools. In addition to documenting the overall trends, this brief disaggregates attrition rates by student characteristics—demographics including gender and race, special needs status (special education students and English language learners), and subsequent achievement.

Mobility is an important determinant of student achievement. Researchers agree that student achievement suffers when children and families move, and the higher incidence of migration for minority and disadvantaged students has been suggested as a contributor to the achievement gaps.¹ But evidence on whether charter school students experience greater mobility than students in traditional public schools is mixed, with some researchers finding a higher rate of attrition for charter school students and others finding no significant difference.²

Over the last 10 years, cities such as New York City, Boston, Chicago, and Washington DC have encouraged and supported the growth of charter schools. However, even though charter schools have become an integral part of New York City’s changing education landscape, there has been little research about the mobility of students attending these schools. This brief throws considerable light on the following questions:

1. What are the rates of attrition from charter schools in New York City that serve elementary grades (kindergarten through third)?
2. Of those students who leave charters, do more transfer to another charter school in the city, or to a New York City traditional public school, or leave the city’s public sector schools altogether?
3. How do the attrition rates for charter schools compare with those of students attending neighboring traditional public schools?
4. How do these rates compare across the three grades?

5. How do these rates differ by student characteristics, including gender and race of the student, English language learner status and special education status, and performance on tests of English Language Arts and mathematics?
6. Is there any evidence for selective attrition, particularly with respect to specific student characteristics or student achievement? Do the data show that low-achieving students, as measured by future test scores, are the ones to leave charter schools?

Sample and Data

This brief includes all students attending kindergarten in 2008-2009 in a New York City charter school that served the elementary grades. Since students can change schools during the year, this brief uses the start date of classes—September 2, 2008 for the 2008-2009 school year—to assign students to schools. Thus, a charter school student included in this sample is one who was registered at a New York City charter school in kindergarten as of September 2, 2008. The same rule is applied to students attending neighboring traditional public schools in our comparison group.

The comparison group of traditional public school students, against whom this brief matches up the attrition rates of charter school students, is defined as follows. Since charter schools enroll a small part of the city’s K-12 student population and are not uniformly distributed geographically across the city, this brief only includes those traditional public schools that are located close to a charter school. The underlying assumption is that if the charter school in question had not been established, then children in the vicinity would most probably have enrolled in the nearby traditional public school.³ Thus, students attending a neighboring traditional public school should constitute an appropriate comparison group for students currently attending a charter school. This assumption is bolstered because charters often use a geographic criterion, including geographically limited lotteries, for admission. Under New York State law, students residing nearby are given priority—ensuring most students are drawn from the neighborhood in which the charter school is located.⁴ For practical implementation, this brief identifies the three nearest traditional public schools for every charter school; students attending these traditional public schools make up the comparison group for charter school students.⁵

Not all schools offer the same array of grades—this is true for both charter and traditional public schools—and therefore this brief restricts the sample to only those which had first

grade in 2009-2010, second grade in 2010-2011 and third grade in 2011-2012. This is to ensure that the mobility patterns which are observed are not the result of students transferring out due to being in their school's terminal grade. This brief also drops the few schools which had less than 10 students in kindergarten. The final sample for charter school students has 53 schools and 3,043 students, whereas the corresponding sample for students in nearby traditional public schools has 116 schools and 7,208 students.

This analysis focuses on the mobility behavior of students comparing charter school students with their counterparts in nearby traditional public schools. The year 2008-2009 is chosen as the base year both because of a desire to focus on more recent experience and because these students can be followed through to 2011-2012. Most students in this cohort would have attended third grade in 2011-2012, when they would take the state-mandated standardized tests for that grade. Moreover, working with 2008-2009 as the base year helps us have a much larger sample—53 charter schools and more than 3,000 charter school students—than we would have if this brief had started with an earlier cohort.⁶

Most of the data used in this analysis have been obtained from the New York City Department of Education (DOE). To assign students to a particular charter or traditional school as of September 2, 2008, we combed through the most detailed data available to us, a file of all student registration transactions including admissions, discharges, and transfers. Next we used the DOE's biographic files to add information on demographic and academic indicators for each student. For years two and three of the study the same procedure was followed: in each case, students are assigned to a school based on their enrollment as of the first day of classes for that year. For the third year, we also used DOE's achievement files.

Data on the names, addresses, and grade spans both of charter schools and traditional public schools have also been extracted from files obtained from the DOE. These files contain information on the exact geographic location of each school (latitude and longitude, x and y coordinates).⁷ These data were used to find traditional public schools closest to each charter school based on distance—the distances were in radian units—and we selected the three closest schools to form the comparison group in the study.

Methodology

This brief compares attrition rates of students in charter schools with those of students in nearby traditional public

schools for the cohort of students who started out in kindergarten in September 2008. A key concern underlying the comparison is that differences in attrition rates may not only reflect fundamental differences between charter and traditional public schools, but also reflect differences in the types of students who attend these schools. In addition to reporting observed differences in attrition rates, this brief uses regression analysis to estimate attrition while controlling for observable differences between students (such as gender or special education status) at charter and traditional public schools. Even so, it is still likely that part of any difference in attrition behavior that this brief finds reflects *unobserved differences* across students (such as intrinsic ability and motivation) rather than the type of schools they attend.

The section begins with a detailed discussion of how this brief defines mobility. It then looks at how students in charter schools differ from their counterparts at traditional public schools in order to identify other differences—apart from the two types of schools—that could influence attrition. Note that this brief is concerned with the rates of student exit *prior to* the end of the range of grades that their school serves.

Defining Mobility. Students were assigned to schools as of the first day of class during the respective year, which was September 2 for the 2008-2009 school year; September 9 for the 2009-2010 year; September 8 for the 2010-2011 year; and September 8 for the 2011-2012 year. Thus, a student is recorded as continuing in the same school in 2009-2010 if she is attending the same school on September 9, 2009 as on September 2, 2008; and so on. Conversely, she is deemed to have transferred to another New York City public school in 2009-2010—either another charter school or a traditional public school—if the records show her in a different school as of September 9, 2009. The student is considered to have left the city's public schools if she does not appear in any public school records as of the start date of classes in that particular year.

This brief focuses on the cumulative incidence of attrition between kindergarten and the following three years. It analyzes whether a student who was enrolled in a school as of the first day of classes during 2008-2009 (September 2, 2008) leaves that school during the following three years, so that she is not enrolled there on the first day of classes during 2011-2012 (September 8, 2011). However, the brief also reports the annual attrition rates between 2008-2009 and 2009-2010, between 2009-2010 and 2010-2011, and between 2010-2011 and 2011-2012 (see Table 3).

Comparing Students at Charter and Traditional Public Schools. Before proceeding to a detailed analysis of attrition rates, it is useful to briefly compare the kindergarten students who entered charter schools in 2008-2009 with kindergarteners entering neighboring traditional public schools that same year (Table 1). There is little difference in terms of gender composition. However, charters serve a much higher percentage of black students, while traditional public schools serve a much higher share of Hispanic students.⁸ The share of Asian students in charter schools is very low relative to the share in neighboring traditional public schools, although the numbers involved are fairly small. Based on eligibility for free or reduced-price lunches, the shares of low-income students seem to be similar in the two types of schools (a little less than three-quarters). However, a much higher share of students in traditional public schools are missing these forms or have incomplete ones—and paying full-prices for lunch because of that—suggesting perhaps that charter schools do a better job of enforcing paperwork requirements. Only considering students whose lunch-eligibility forms are complete, a larger share of students at nearby traditional public schools come from low-income families.⁹

The main differences regarding student composition between charters and traditional public schools lie in the rates of serving special education students and English language learner (ELL) students. About 7 percent of kindergarten students in nearby traditional public schools are special education students; the share in charter schools is less than 1 percent. The difference in rates of serving ELL students is similarly large—18 percent in traditional public schools compared with 4 percent in charter schools. These differences have been noted in other studies of charter schools in New York City. The brief revisits the issue of special education students later in Figure 2 and Tables 6 and 7.

Incidence of Attrition

Kindergarteners in charter schools exhibit significantly less mobility during the subsequent three years relative to their peers in neighboring traditional public schools. Most of the difference is attributable to attrition in the immediate post-kindergarten year, and almost all is accounted for by differences in the rate of switching schools within the New York City public school system. Only a few students repeat grades, in either charter schools or nearby traditional public schools. In terms of destination schools, movers from both charter schools and traditional public schools in higher grades increasingly transfer to a traditional public school rather than a charter school. When this brief looks at various student subgroups, there are significant differences among students in traditional public schools, but relatively less so among students in charter schools. The exception is special education students in charter schools, who leave their schools at much higher rates than others.

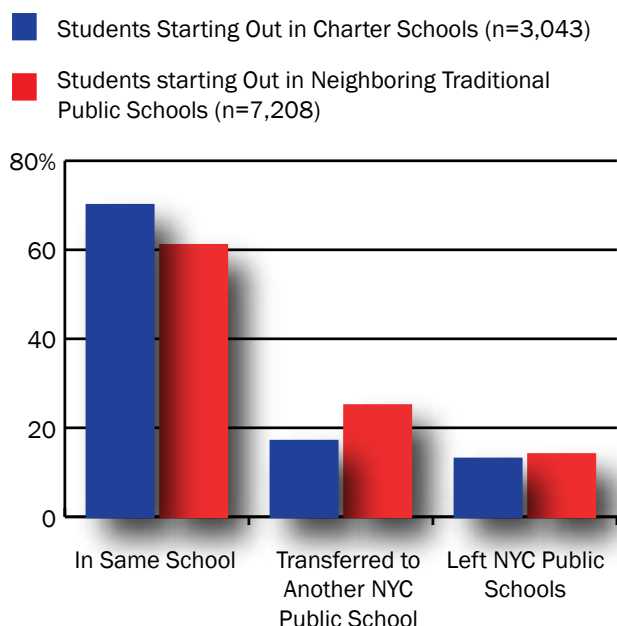
Of the 3,043 students who were attending kindergarten in charter schools in 2008-2009, about 70 percent remained in the same school in 2011-2012, three years later (see Figure 1). This number is considerably higher than for students attending kindergarten in neighboring traditional public schools in 2008-2009—only 61 percent of the latter group remained in their original schools after three years. The difference is almost entirely due to the difference in the share transferring to another school within the system; while 17 percent of kindergarteners in charter schools switched schools later, 25 percent of kindergarteners in nearby traditional public schools did so. The share of students leaving the New York City public school system is almost identical across the two groups.

It is instructive to look at the grade distribution of 2008-2009 kindergarteners who remained in either the city's traditional public schools or charter schools in 2011-2012

Student Attributes	Percentage of Students in Charter Schools	Percentage of Students in Nearby Traditional Public Schools
Male	51.0	50.4
Female	49.0	49.6
White Students	4.2	8.8
Black Students	61.1	33.3
Hispanic Students	26.7	47.8
Asian Students	1.7	7.9
Other/Not Specified	6.3	2.2
Students Eligible for Free or Reduced-Price Lunches, Based On Form	74.1	70.6
Students Paying Full-Price for Lunch, Based on Form	19.5	6.8
Students Paying Full-Price for Lunch, Missing or Incomplete Form	6.4	22.6
Special Education Students	0.8	7.0
English Language Learner Students	4.0	18.3
Total Number of Students	3,043	7,208
SOURCE: IBO analysis of Department of Education data Independent Budget Office		

Figure 1. Attrition Rates of Students in Charter Schools and in Traditional Public Schools

Students attending kindergarten in 2008-2009 followed three years later (2011-2012)



SOURCE: IBO analysis of Department of Education data
Independent Budget Office

Table 2. Grade Distribution of 2008-2009 Kindergarteners After Three Years, in 2011-2012

	Students Starting Out In Charter Schools		Students Starting Out In Nearby Traditional Public Schools	
	Number	Percentage	Number	Percentage
Grade 1	4	0.1	21	0.3
Grade 2	297	9.8	771	10.7
Grade 3	2,323	76.3	5,424	75.2
Grade 4	43	1.4	8	0.1
Total Students Matched in 2011-2012	2,667	87.6	6,224	86.3
Left New York City Public Schools	376	12.4	984	13.7
Total Students Starting Kindergarten in 2008-2009	3,043	100	7,208	100

SOURCE: IBO analysis of Department of Education data
NOTE: The sample includes only those students who could be matched in 2011-2012 as enrolled in New York City Public Schools (either charter or traditional public) as of the first day of classes (September 8, 2011). Those who left New York City public schools are not included.
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(table 2). Not surprisingly, the overwhelming majority were attending grade 3, as they would have if they progressed at the usual rate. About 10 percent of both charter and traditional public school students were attending grade 2 due to repeating a grade earlier. In addition, there were a few 2008-2009 kindergarteners who skipped a grade and were attending grade 4 in 2011-2012. Although it was more common for charter school students to skip a grade, the number of students who did so was too small to draw any substantive conclusions.

Attrition During Intervening Years. Of students who were attending kindergarten in charter schools in 2008-2009, about 85 percent remained in the same school the next year (2009-2010). This is shown in Table 3, which reports a more detailed picture of attrition throughout the three intervening years, disaggregating students' mobility status as of the first day of classes during each intervening year (September 9, 2009; September 8, 2010; and September 8, 2011). This figure is 9 percentage points higher than the corresponding figure for students who were attending kindergarten in neighboring traditional public schools. The difference comes both from the rate of transferring to another school within the school system (9 percent for kindergarteners in charter schools versus 14 percent for kindergarteners in traditional public schools) and from the rate of leaving the city's public schools (6 percent versus 9 percent).

Over a two-year horizon, students originally in charter schools again have less attrition: 77 percent continue in their original school, compared with only 67 percent of students who started out at nearby traditional public schools. However, the differences seem to have stabilized after the first year, and remain roughly the same when looking at a three-year horizon. In the next table (Table 4) this is analyzed further. Students who continued at their schools are subdivided into those who progressed to the

Table 3. Mobility Rates as of First Day of Classes, 2009-2010, 2010-2011, and 2011-2012 School Years

	Percentage as of		
	September 9, 2009	September 8, 2010	September 8, 2011
Students in Charter Schools			
Same School	85	77	70
Different NYC Public School	9	14	17
Left NYC Public Schools	6	10	12
Students in Nearby Traditional Public Schools			
Same School	76	67	61
Different NYC Public School	14	20	25
Left NYC Public Schools	9	12	14

SOURCE: IBO analysis of Department of Education data
Independent Budget Office

Table 4. Attrition Status of Students Attending Kindergarten in 2008-2009, Followed Over the Next Three Years*Either transferred or quit New York City public schools*

Attrition Status in Various Years	Students in Charter Schools		Students in Nearby Traditional Public Schools	
	Number	Percentage	Number	Percentage
Students in Grade Kindergarten (September 2, 2008)	3,043	100	7,208	100
Status as of September 9, 2009				
Same School	2,584	85	5,491	76
Progressed to Next Grade	2,500	82	5,379	75
Repeating Same Grade	84	3	112	2
Different NYC Public School	272	9	1,043	14
Traditional Public School	194	6	785	11
Charter School	78	3	258	4
Left NYC Public Schools	187	6	674	9
Status as of September 8, 2010				
Same School	2,340	77	4,846	67
Progressed to Next Grade	2,257	74	4,585	64
Repeating Same Grade	83	3	261	4
Different NYC Public School	411	14	1,474	20
Traditional Public School	312	10	1,159	16
Charter School	99	3	315	4
Left NYC Public Schools	292	10	888	12
Status as of September 8, 2011				
Same School	2,131	70	4,414	61
Progressed to Next Grade	2,040	67	4,257	59
Repeating Same Grade	91	3	157	2
Different NYC Public School	525	17	1,810	25
Traditional Public School	397	13	1,457	20
Charter School	128	4	353	5
Left NYC Public Schools	387	13	984	14

SOURCE: IBO analysis of Department of Education data

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next grade and those who were repeating the same grade. Students who left their original schools are disaggregated into those who transferred to another New York City public school and those who left the system.

Attrition Disaggregated by Grade Repetition and Destination.

A slightly higher share of the charter school cohort is repeating kindergarten in 2009-2010 as compared with the traditional public school cohort, though the share is small in both groups (Table 4). Among movers from charter schools, about the same share transfers to another charter school, compared with movers from nearby traditional public schools. Across the years, these same patterns prevail—in higher grades, however, movers from both charter schools and traditional public schools increasingly transfer to a traditional public school rather than a charter school. The increased incidence of transfer to a traditional public school, instead of a charter

school, might be due to the fact that many charters limit admissions to traditional starting points (such as kindergarten for elementary schools).

Attrition and Demographics. There is little difference in attrition rates by student subgroups among students in charter schools, except for special education students. This is in contrast to the results for their peers in neighboring traditional schools, for whom significant differences are evident. The following subgroups are compared: male students, female students, white students, black students, Hispanic students, students eligible for free or reduced-price lunches (based on completed form), students paying full price for lunch (based on completed form), special education students, and English language learner students. The results are reported as per the original three-way classification of turnover—distinguishing between those who continued in their current schools, those who

Table 5. Attrition Status of Various Subgroups of Students*Students attending kindergarten in 2008-2009, School Status as of September 8, 2011*

Attrition Status in Various Years	Students in Charter Schools	Students in Nearby Traditional Public schools
Male Students		
Students in Kindergarten (September 2, 2008)	1,551	3,632
Same School (%)	69	61
Different NYC Public School (%)	18	26
Left NYC Public Schools (%)	13	13
Female Students		
Students in Kindergarten (September 2, 2008)	1,492	3,576
Same School (%)	71	62
Different NYC Public School (%)	17	24
Left NYC Public Schools (%)	12	14
White Students		
Students in Kindergarten (September 2, 2008)	127	631
Same School (%)	75	73
Different NYC Public School (%)	15	15
Left NYC Public Schools (%)	10	13
Black Students		
Students in Kindergarten (September 2, 2008)	1,860	2,397
Same School (%)	70	53
Different NYC Public School (%)	16	32
Left NYC Public Schools (%)	13	15
Hispanic Students		
Students in Kindergarten (September 2, 2008)	811	3,449
Same School (%)	68	63
Different NYC Public School (%)	20	24
Left NYC Public Schools (%)	12	13
Students Eligible for Free or Reduced-Price Lunch, Based on Completed Form		
Students in Kindergarten (September 2, 2008)	2,255	5,092
Same School (%)	70	58
Different NYC Public School (%)	18	29
Left NYC Public Schools (%)	12	13
Students Paying Full-Price for Lunch, Based on Completed Form		
Students in Kindergarten (Sep 2, 2008)	594	490
Same School (%)	76	66
Different NYC Public School (%)	13	20
Left NYC Public Schools (%)	12	14
Special Education Students		
Students in Kindergarten (September 2, 2008)	25	503
Same School (%)	20	50
Different NYC Public School (%)	72	36
Left NYC Public Schools (%)	8	14
English Language Learner Students		
Students in Kindergarten (September 2, 2008)	123	1,316
Same School (%)	72	67
Different NYC Public School (%)	16	21
Left NYC Public Schools (%)	11	12

SOURCE: IBO analysis of Department of Education data

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transferred to another New York City public school and those who quit the New York City public schools. The detailed results are presented in Table 5.

Among students in the charter school cohort, the rates of attrition are often very similar across most subgroups. For example, male students, female students, black students, Hispanic students, students eligible for free or reduced-price lunches and ELL students—each of these subgroups all had about the same 70 percent probability of continuing in their original (charter) school after three years. The exception is special education students. There is more divergence within the traditional public school cohort, particularly when disaggregated by race/ethnicity—for example, 73 percent of white students remained at the same school after three years, compared with 63 percent of Hispanics and only 53 percent of blacks.

A Closer Look at Students with Special Needs. The issue of serving an adequate number of special education students often crops up in discussions about charter schools. In kindergarten, the incidence of special needs in charter schools was about one-seventh of that in traditional public schools. There is a big jump in classification rates during the first grade, particularly in charter schools. After first grade, however, the rates of classification come down—both in charter schools and in nearby traditional public schools. By third grade, the incidence of special needs is 13 percent for students starting out in charters and 19 percent for students starting out in nearby traditional public schools, irrespective of the type of (New York City public) school the individual student attended that year. The attrition rates are higher for special education students who start kindergarten in charter schools than for special education students who start in neighboring traditional public schools.

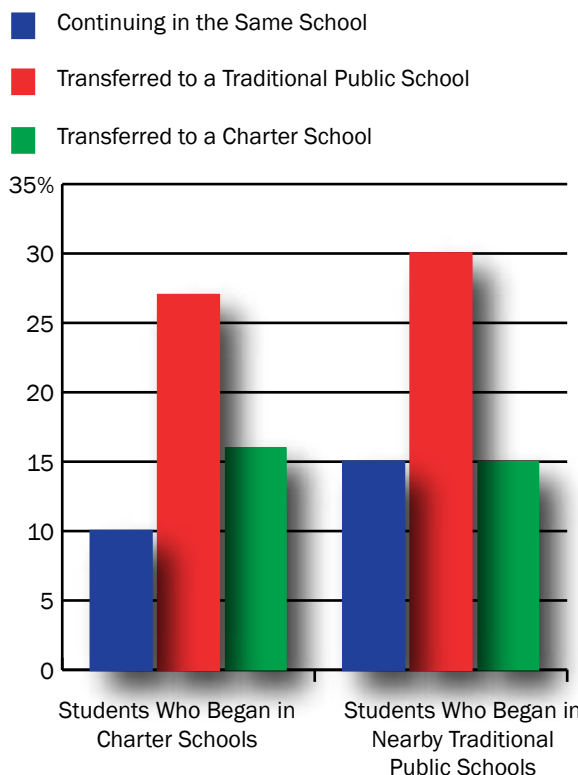
Only 20 percent of students classified as requiring special education who started kindergarten in charter schools remained in the same school after three years, with the vast majority transferring to another New York City public school (see Table 5). The corresponding persistence rate for students in nearby traditional public schools is 50 percent.

To capture differences in attrition of special education students across charters and traditional public schools, this brief follows these students over time, as they progress through school from kindergarten to third grade. After three years, out of the 2,656 students who started in charter schools in September 2008 and are still attending the

city’s public sector schools—either the same charter school (2,131) or another New York City public school (525)—344 students overall, or 13 percent, had been classified as special education students.^{11,12} Of those continuing in the same charter school, 10 percent were identified as special education students by the third year, and of those transferring out to another charter school, 16 percent were special education students (see Figure 2). But of those transferring out to another traditional public school, fully 27 percent were classified as special education students.

In comparison, out of the 6,224 students who started out in kindergarten in neighboring traditional public schools and were still attending the city’s public schools after three years—4,414 in the same traditional public school and 1,810 in another New York City public school—1,160 students overall, about 19 percent, had been identified as special education students by the third year. This is higher than the corresponding share (13 percent) for students who started out in charter schools. Breaking down the cohort by attrition status, of those continuing in the same traditional public school, 15 percent had been identified as needing special education services. Of those transferring out to another New York City public school, 30 percent

Figure 2. Special Education Students Disaggregated By Attrition Status, 2011-2012



SOURCE: IBO analysis of Department of Education data
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were receiving special education services—but of those transferring out to a charter school only 15 percent were special education students. This is in line with results noted above for the charter school cohort and suggests that special education students, at least once they have been classified as such, are more likely to attend traditional public schools.

At the start of kindergarten, out of the 3,043 students starting out in charter schools in kindergarten, only 1 percent were labeled as needing special education services—even after one year, less than 1 percent of students continuing in the same charter school were labeled as special education (see Table 6). For students who begin in charter schools, the big jump in special education status comes between first and second

grades—10 percent of students continuing in the same school were classified as requiring special education services by the start of second grade.¹³

To compare the rates at which students are classified into special education as they progress through school, this brief follows separately the 3,043 students who started out kindergarten in charter schools and the 7,208 students who started out kindergarten in neighboring traditional public schools (Table 7). Initially, there were only 25 special education kindergarteners in charter schools, as compared with 505 special education kindergarteners in nearby traditional public schools. After one year, at the beginning of 2008-2009, among those from the original charter school cohort of 3,043 students who were still attending the same charter school, 22 had been classified as special

Table 6. Classification of Students in Special Education as They Progress Through School, Kindergarten Through Third Grade

Attrition Status in Various Years	Students in Charter Schools				Students in Nearby Traditional Public Schools			
	Total Students	Percentage	Students in Special Education	Percentage	Total Students	Percentage	Students in Special Education	Percentage
Students in Kindergarten (September 2, 2008)	3,043	100	25	1	7,208	100	505	7
Status as of September 9, 2009								
Same School	2,584	85	22	1	5,491	76	408	7
Progressed to Next Grade	2,500	82	21	1	5,379	75	383	7
Repeating Same Grade	84	3	1	1	112	2	25	22
Different NYC Public School	272	9	25	9	1,043	14	153	15
Traditional Public School	194	6	25	13	785	11	151	19
Another Charter School	78	3	0	0	258	4	2	1
Left NYC Public Schools	187	6	---	---	674	9	---	---
Status as of September 8, 2010								
Same School	2,340	77	244	10	4,846	67	691	14
Progressed to Next Grade	2,257	74	213	9	4,585	64	624	14
Repeating Same Grade	83	3	31	37	261	4	67	26
Different NYC Public School	411	14	95	23	1,474	20	382	26
Traditional Public School	312	10	84	27	1,159	16	341	29
Another Charter School	99	3	11	11	315	4	41	13
Left NYC Public Schools	292	10	---	---	888	12	---	---
Status as of September 8, 2011								
Same School	2,131	70	218	10	4,414	61	667	15
Progressed to Next Grade	2,040	67	183	9	4,257	59	624	15
Repeating Same Grade	91	3	35	38	157	2	43	27
Different NYC Public School	525	17	126	24	1,810	25	493	27
Traditional Public School	397	13	106	27	1,457	20	439	30
Another Charter School	128	4	20	16	353	5	54	15
Left NYC Public Schools	387	13	---	---	984	14	---	---

SOURCE: IBO analysis of Department of Education data

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Table 7. Students in Special Education by Attrition and Classification Status, Kindergarten Through Third Grade		
	Students in Charter Schools	Students in Nearby Traditional Public Schools
Special Education Students in Kindergarten (as of September 2, 2008)	25	505
Status as of September 9, 2009		
Same School	22	408
Previously Classified (%)	18	76
Newly Classified (%)	82	24
Different NYC Public School	25	153
Previously Classified (%)	64	75
Newly Classified (%)	36	25
Left NYC Public Schools	---	---
Status as of September 8, 2010		
Same School	244	691
Previously Classified (%)	5	48
Newly Classified (%)	95	52
Different NYC Public School	95	382
Previously Classified (%)	41	46
Newly Classified (%)	59	54
Left NYC Public Schools	---	---
Status as of September 8, 2011		
Same School	218	667
Previously Classified (%)	89	85
Newly Classified (%)	11	15
Different NYC Public School	126	493
Previously Classified (%)	88	76
Newly Classified (%)	12	24
Left NYC Public Schools	---	---
SOURCE: IBO analysis of Department of Education data		
NOTES: The table shows the rates of classification of students into special education as they progress through school, beginning kindergarten. The italicized figures denote percentages. For example, as of the beginning of the school year 2011-2012, among those from the original charter school cohort of 3,043 students who were still attending the same charter school, 218 had been classified as special education students. Eleven percent of them were newly classified during the previous year 2010-2011, while 89 per cent had already been classified in earlier years (prior to 2010-2011). Of those from the same charter school cohort who had transferred to another New York City public school, 126 had been classified likewise.		
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education students, most of them being newly classified as such during the previous year (2008-2009).

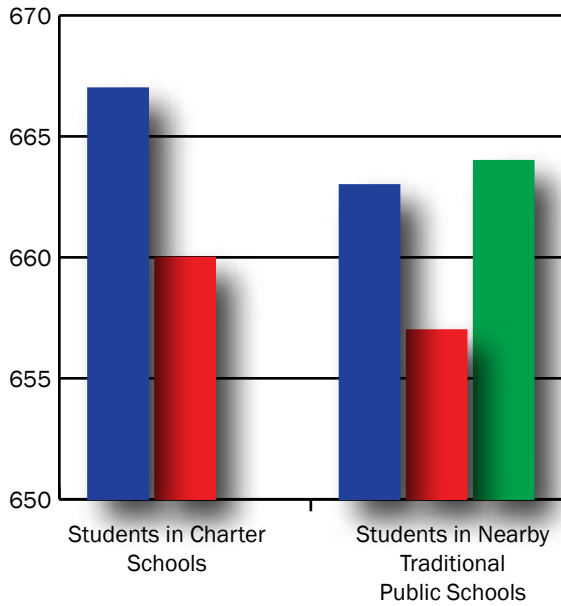
Over the same time period, among those from the original traditional public school cohort of 7,208 students who were still attending the same traditional public school, 408 had been classified as special education students—here, however, relatively few were newly classified. There is a big jump in classification rates during the first grade, particularly in charter schools—the number of students from the original cohort who were still attending the same school as of the beginning of 2010-2011 and are classified as special education students jumps from 25 to 244. After this year, however, the rates of classification come down—both in charter schools and in traditional public schools.

To summarize, starting in in kindergarten only 1 percent of students in charter schools were classified as requiring special education, compared with 7 percent of students in neighboring traditional public schools. By third grade, the incidence of students with special needs increased to 13 percent for students starting out in charters and to 19 percent for students starting out in traditional public schools. By grade 3, 63 percent of the 344 special education kids from the charter sample were in the same school as they started, 6 percent were in another charter, and 31 percent were in traditional public schools. From the sample of students who started out in nearby traditional public schools, 57 percent of the 1,160 special education students were in the same school, 38 percent were in another traditional public school, and 5 percent were in a charter school.

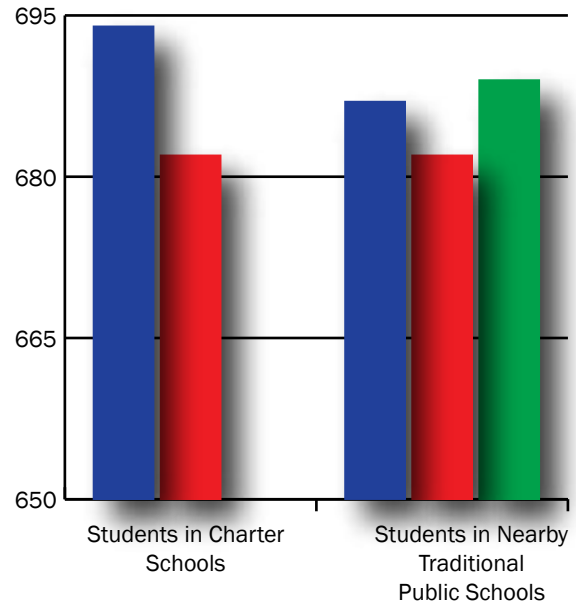
Figure 3. Third Grade Test Performance (Average Scale Scores) of Students, Disaggregated by Mobility Status

■ Continuing in the Same School
 ■ Transferred to a Traditional Public School
 ■ Transferred to a Charter School

English Language Arts, Scale Score



Mathematics, Scale Score



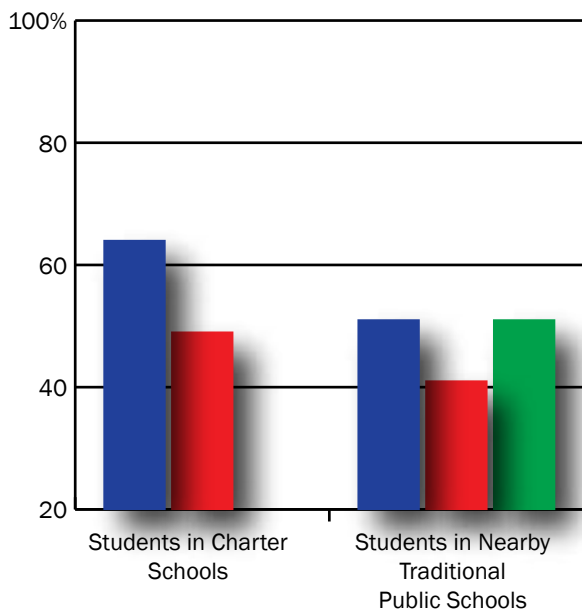
SOURCE: IBO analysis of Department of Education data

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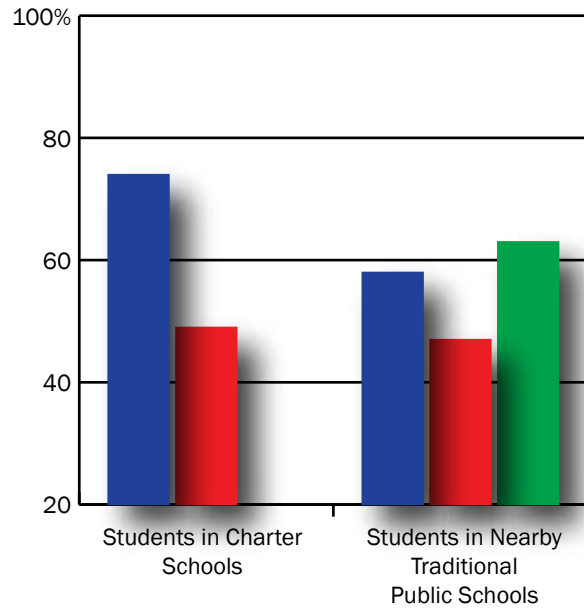
Figure 4. Third Grade Test Performance (Meeting or Exceeding Proficiency Standard) of Students, Disaggregated by Mobility Status

■ Continuing in the Same School
 ■ Transferred to a Traditional Public School
 ■ Transferred to a Charter School

English Language Arts



Mathematics



SOURCE: IBO analysis of Department of Education data

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Table 8. Third Grade Test Performance by Students, Disaggregated by Mobility Status

	Students Who Continued at School	Students Who Transferred to Another NYC Public School	Students Who Transferred To a Charter School from a Traditional Public School
Average Scale Scores			
English Language Arts			
Students in Charter Schools	667	660	---
Students in Nearby Traditional Public Schools	663	658	663
Mathematics			
Students in Charter Schools	694	682	---
Students in Nearby Traditional Public Schools	687	683	689
Students Meeting or Exceeding Proficiency Standard			
English Language Arts			
Students in Charter Schools	64%	49%	---
Students in Nearby Traditional Public Schools	51%	41%	51%
Mathematics			
Students in Charter Schools	74%	49%	---
Students in Nearby Traditional Public Schools	58%	47%	63%
SOURCE: IBO analysis of Department of Education data			
NOTES: The last column only includes students who started out kindergarten in (neighboring) traditional public schools but then switched to charter schools at some point, so that by the beginning of third grade they are attending a charter school.			

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Third Grade Attrition and Test Scores. Students in New York State enrolled in grades 3 through 8 take standardized tests in English language arts and mathematics. Since there is a large literature detailing the deleterious effects of mobility on student performance, holding other things constant, it is instructive to compare the academic performance of students who changed schools (movers) to those of students who remained at their original schools (stayers). These comparisons are given in Table 8 and Figures 3 and 4. Results are shown from the third grade state reading and mathematics tests—in most cases this brief reports results using two measures of achievement: average scale score and whether a student met or exceeded the proficiency standard.¹⁴

Note first that in the absence of test score data on students who left New York City public schools, the comparison is only between those who stay and those who move to other city public schools. Second, the tests are given in the spring of the third year, so most students in our sample would have taken them in spring 2012. Third, in order to see how students who move from traditional public schools to charters perform relative to those who stay or move to a different traditional school, this brief defines a separate category of students—those among the traditional public school students who switch to a charter school.

The results are revealing. Among students in charter schools, those who remained in their kindergarten schools

through third grade had higher average scale scores in both reading (English Language Arts) and mathematics in third grade compared with those who had left for another New York City public school (Figure 3). This basic pattern is repeated when looking at the whether students met or exceeded the proficiency standard (Figure 4)—however, here the gap between stayers and movers is much wider for mathematics than for reading. Students in traditional public schools exhibit similar trends to those in charters—a modest but consistent positive gap in favor of students who are continuing irrespective of the subject and the particular measure this brief uses.

One important difference between the two types of schools, particularly manifest when the percentage of students meeting or exceeding proficiency standard is used as the metric, is that the gap between the stayers and movers was significantly larger in charters compared with those in traditional public schools. Also, this gap is larger in mathematics compared with reading. While in reading the gap between stayers and movers is 15 percentage points in charter schools versus 10 percentage points in nearby traditional public schools, the corresponding gap in math is 25 percentage points in charters versus 11 percentage points in nearby traditional public schools (Figure 4 and Table 8).

There are also intriguing patterns for students who started kindergarten in traditional public schools but then switched

Table 9a. Attrition Status by Reading Achievement*Students attending kindergarten in 2008-2009, who took third grade tests in 2011-2012*

Students in Kindergarten As of September 2, 2008	Students in Charter Schools		Students in Nearby Traditional Public Schools	
	Transferred to Another NYC Public School	Continued at School	Transferred to Another NYC Public School	Continued at School
Average Proficiency Rating	2.84	3.07	2.76	2.92
Average Scale Score	660	667	658	663
Distribution of Performance Levels				
Percent Below Standard	16%	5%	19%	14%
Percent Meets Basic Standard	36%	31%	40%	35%
Percent Meets Proficiency Standard	45%	60%	38%	45%
Percent Exceeds Proficiency Standard	4%	4%	3%	6%
Number of Students	416	1,848	1,415	3,893

Table 9b. Attrition Status by Mathematics Achievement*Students attending kindergarten in 2008-2009, who took third grade tests in 2011-2012*

Students in Kindergarten As of September 2, 2008	Students in Charter Schools		Students in Nearby Traditional Public Schools	
	Transferred to Another NYC Public School	Continued at School	Transferred to Another NYC Public School	Continued at School
Average Proficiency Rating	2.94	3.36	2.96	3.1
Average Scale Score	682	694	683	687
Distribution of Performance Levels				
Percent Below Standard	15%	3%	14%	9%
Percent Meets Basic Standard	36%	23%	39%	33%
Percent Meets Proficiency Standard	44%	57%	38%	46%
Percent Exceeds Proficiency Standard	5%	17%	9%	12%
Number of Students	419	1,848	1,419	3,895

SOURCE: IBO analysis of Department of Education data

NOTE: We do not have test score data on students who were not attending city Department of Education schools.

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to charter schools at some point, so that by the beginning of third grade they were attending a charter school. Generally speaking, those who transferred to a charter school from a traditional public school later performed at a

- higher rate compared with their peers from these same traditional public schools who transferred out (all movers from nearby traditional public schools)
- similar, or slightly higher rate, compared with their peers from the same traditional public schools who stayed in the same school (stayers in traditional public schools)
- lower rate compared with the students in charter schools who stayed in the same school (stayers in charter schools)

- higher rate compared with those who transferred out from charter schools, the difference being small for reading (ELA) but relatively large for mathematics.

Note, however, that we do not know the applicant pools for the charter schools, and which students they decide to admit, in their non-entry grades (after kindergarten). So the above comparison is purely descriptive, in terms of noting the performance of students who started kindergarten in neighboring traditional public schools in 2008-2009 (and are included in our study as such) but had then transferred to a charter school before the third grade.

The fact that leavers from charter schools have lower test scores than the stayers suggests that such attrition serves to increase the overall academic performance

of these schools and might make them more attractive. This might be important if parents considering where to send their child look more to the achievement level at the school (particularly average test scores) than to the degree of improvement in student performance. But, there are several caveats. First, test scores of those who join a charter school in non-entry grades, transferring from a traditional public school in the city, are actually lower than those of the stayers in charter schools (average scale score of 664 compared with 667) though higher than the leavers. Thus, if the charters had decided *not* to fill up the seats left vacant by transferring-out students, their average performance would be even higher. Second, the way the city's Department of Education assigns letter grades to schools puts more emphasis on student improvement or progress, rather than on the absolute levels of performance, it is not obvious that such selective attrition helps charters attain a better letter grade. Improving a high-performing student's test scores is often more difficult than similar improvements elsewhere, and the Department of Education gives extra credit for improving student performance at the lower end of the scale.

Regression Analysis

So far this schools brief has used simple descriptive statistics to show that kindergarteners in charter schools exhibit significantly less mobility during the subsequent three years relative to their peers in neighboring traditional public schools. We use a regression framework to determine whether this result holds while controlling for many of the individual student characteristics that might independently affect mobility. We first look at the overall incidence of leaving one's school, then this is broken down into transferring to another New York City public school and leaving New York City public schools altogether.

The comparisons control for different demographic characteristics of the students, including gender, poverty, and race/ethnicity, as well as for the number of days the student was absent. The brief also adjusts for whether a student had been classified as a special education student, and whether he had been classified as an English language learner. Recall that for each charter school in the sample, the comparison group consists of the three traditional public schools which were located *nearest* to it. This ensures that all the schools in one group—consisting of one charter school and its three nearest traditional public schools—belong to the same neighborhood or community. As a check on the robustness of the results, in one specification this brief controls for neighborhood-specific

factors to test whether the results are biased by one type of schools being located in specific communities. The results, however, remain very similar.

Since the dependent variable is a 0-1 dummy variable, we run linear probability models as well as logistic regressions. Since the findings are very similar, only the results from the latter analysis are reported. Also, for ease of exposition, the odds ratios are reported instead of the actual coefficients. The odds ratio corresponding to a particular independent variable shows the effect of that variable on the relative probability that the outcome (dependent) variable will happen, controlling for other factors. An odds ratio of less than 1 suggests that students with that characteristic had a lower probability of leaving their schools. Conversely, characteristics with an odds ratio greater than 1 imply that students with that characteristic had a higher probability of leaving. For example, the fact that the odds ratio on the charter dummy is 0.68 in column 1 in Table 10 means that compared with a student in a nearby traditional public school, a student in a charter school was only 68 percent as likely—or equivalently, 32 percent less likely—to leave his or her kindergarten school.

Regression Results. Students in charter schools had a significantly smaller probability of leaving their schools within three years of starting kindergarten, relative to their peers in traditional public schools. Most of the demographic factors are associated with mobility in expected ways, with black students, students from low-income families, and special education students leaving at higher rates.

Compared with her peer in a neighboring traditional public school, a kindergartener in a charter school left her original school at a rate that is about one-third lower (see Table 10, column 1). When different background variables, classification statuses, and rates of absenteeism are included the difference gets narrowed—but still students in charter schools are 23 percent to 29 percent less likely than their peers in traditional public schools to leave their schools. Note, however, that there may be differences between students attending charters and those attending nearby traditional public schools that this brief has not been able to capture, and part of the gap in observed attrition patterns across these schools might be due to those factors rather than to attending a particular type of school. Note also that because this brief is looking at mobility patterns of students starting out as kindergarteners and following them over the next three years, we do not have any data on academic performance of these students that predate the mobility patterns which

Table 10: Following Kindergarteners in 2008-2009 Through the Next Three Years, Logistic Regressions, With Odds Ratios

Dependent variable: Whether left one's original (kindergarten, 2008-2009) school within three years

	(1)	(2)	(3)	(4)
Charter	0.68***	0.60***	0.77***	0.71***
Female		0.92**	0.96	0.96
Lunch-eligible		1.23***	1.14**	1.10*
White		0.58***	0.59***	0.61***
Black		1.03	0.99	0.99
Hispanic		0.79**	0.79**	0.76**
Asian		0.61***	0.67***	0.71**
English Language Learner Student			0.83***	0.84**
Special Education Student			1.61***	1.61***
Number of Days Absent			1.03***	1.03***
Observations	10,251	10,251	10,251	10,251
Neighborhood Fixed Effects	No	No	No	Yes

SOURCE: IBO analysis of Department of Education data
 NOTE: One asterisk (*) denotes statistical significance at the 10 percent level, two asterisks denote statistical significance at the 5 percent level, and three asterisks denote statistical significance at the 1 percent level.
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are analyzed.¹⁵ Our analysis does not additionally control for student achievement in the regression analysis.

Student Demographics and Mobility. Most of the demographic factors are associated with mobility in expected ways. Female students in the study cohort were no more likely than their male counterparts to leave their schools. But students from low-income backgrounds, proxied by eligibility for free or reduced-price lunches, had higher rates of leaving. White students, and to a lesser extent Asians and Hispanics, were less likely to leave their schools than black students. The incidence of leaving was strikingly high for special education students—they left at close to twice the rate for general education students. In contrast, ELL students changed schools at a significantly lower rate. As one would expect, the number of days that a student was absent is a significant predictor of subsequent attrition.

We also tested to see whether demographic factors affected the mobility of students in charter schools differently. For brevity, these results are not shown, but they are along expected lines. One interesting result is that differences in the rate at which low-income students and students at other income levels leave their schools are

much smaller in charter than in traditional public schools: low-income students in charter schools leave school at almost the same rate as students at other income levels. We also find that absenteeism is an even greater predictor of turnover for students in charter schools, compared with its predictive power for students in nearby traditional public schools and, not surprisingly, find that special education students in charter schools leave at very high rates.

What factors predict student transfer to another New York City public school? Are these the same factors that are associated with leaving the city's public schools?

When students leave a New York City public school, they can either go to another city public school, or they can leave the city's public schools altogether. Students in charter schools transferred to another New York City public school at much lower rates compared with students in nearby traditional public schools. However, the differences are smaller for the probability of leaving the New York City public school system. The effects of various demographic variables and student classification statuses also vary according to whether one is looking at the incidence of transferring to another DOE school or whether one is studying attrition out of the city's public schools. This brief employs multinomial regression models to analyze this question.

Students in charter schools transferred to another of the city's public schools at much lower rates—they were 40 percent less likely to transfer out as compared with students in nearby traditional public schools. However, they were only 19 percent less likely to leave the system (see Table 11, columns 1 and 2).

Free or reduced-price lunch eligible students have a significantly higher likelihood of transferring to another New York City public school, but are not more likely to leave the city's public schools. The *overall* higher mobility of students from low-income families stems from transferring to other New York City public schools; these students are actually significantly less likely to leave the system compared with students from middle- and upper-income families. Similarly, special education students are more likely to transfer within New York City's public school system than to leave the system. An ELL student has a lower probability of transferring out as well as of quitting the system, although the effects are statistically significant only in the former case. The one variable which has consistent power for predicting attrition is the number of days a student had been absent.

Table 11: Following Kindergarteners in 2008-2009 Through the Next Three Years, Multinomial Logit Regressions, With Odds Ratios

Baseline Status is "Remain in same school";
Status = 2 is "Transfer to another NYC Public School"; Status = 3 is "Left NYC Public Schools

	Status=2	Status=3	Status=2	Status=3	Status=2	Status=3	Status=2	Status=3
Charter	0.60***	0.81***	0.52***	0.74***	0.69***	0.91	0.61***	0.89
Female			0.90**	0.96	0.95	0.98	0.95	0.98
Lunch-eligible			1.61***	0.84***	1.49***	0.78***	1.41***	0.79***
White			0.61***	0.56***	0.61***	0.57***	0.66**	0.56***
Black			1.11	0.93	1.06	0.89	1.04	0.91
Hispanic			0.82	0.75*	0.83	0.74*	0.79*	0.73*
Asian			0.66**	0.55***	0.74*	0.59***	0.86	0.56***
English Language Learner Student					0.81***	0.87	0.81***	0.9
Special Education					1.86***	1.17	1.89***	1.16
Days Absent					1.03***	1.02***	1.03***	1.02***
Observations	10,251		10,251		10,251		10,251	
Neighborhood Fixed Effects	No		No		No		Yes	

SOURCE: IBO analysis of Department of Education data

NOTE: One asterisk (*) denotes statistical significance at the 10 percent level, two asterisks denote statistical significance at the 5 percent level, and three asterisks denote statistical significance at the 1 percent level.

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Conclusion

Over the last 12 years charter schools have become an important element in New York City's public K-12 educational landscape. Currently, there are more than 150 charters operating in the city, with more scheduled to open in the near future. Almost 5 percent of the city's public school students attend a charter school. This schools brief analyzes the mobility of students in the city's charter schools, comparing them with their peers in neighboring traditional public schools.

The results—consistent across both simple cross-tabulations and a more sophisticated regression analysis—can be summarized as follows. First, on average, students in charter schools leave their schools at a lower rate than students at nearby traditional public schools.

Second, this is the case even when this brief disaggregates the overall student population into various subgroups, based on gender, race, poverty status, and English language learner status. For most subgroups, students in charter schools leave their schools at a lower rate.

Third, the big exception is special education students, who leave charter schools at a much higher rate than either general education students in charters or special education students in traditional public schools. Charter schools enroll a disproportionately lower share of students classified in special education compared with nearby traditional public

schools, although among charter school students there is a big jump in classification rates in first grade.

Fourth, among students in both charter schools and nearby traditional public schools, those who remained in their kindergarten schools through third grade had higher test scores and proficiency ratings in third grade for both reading and mathematics. However, the achievement gap between stayers and movers was considerably larger in charters compared with traditional public schools and was much larger for mathematics than for reading.

Finally, looking at the third grade performance of students who started kindergarten in traditional public schools but later switched to charter schools, they had lower test scores compared with the stayers in charter schools, but higher test scores than those who transferred out from charter schools.

These results are likely caused by many factors. While there may be causal effects of attending charter schools, it is possible that other factors such as unobserved differences in student characteristics contribute to some of the gaps in mobility patterns. Also, charter schools in New York City are still in the process of evolving and maturing. With the recent opening of many new schools during the Bloomberg Administration, traditional public schools have also seen considerable change in recent years. How these changes play out will affect student migration patterns in the future.

This report prepared by Joydeep Roy

Endnotes

¹See, for example, Hanushek, Kain, and Rivkin, "Disruption versus Tiebout Improvement: The Costs and Benefits of Switching Schools," *Journal of Public Economics*, Volume 88/9-10, 2004; and Roy, Maynard, and Weiss, "The Hidden Costs of the Housing Crisis: The Long-term Impact of Housing Affordability and Quality on Young Children's Odds of Success," written for the Partnership for America's Economic Success, 2008, www.pewtrusts.org/our_work_report_detail.aspx?id=47132

²Bifulco and Ladd, "The Impact of Charter Schools on Student Achievement: Evidence from North Carolina," *Education Finance and Policy*, 1(1), Winter 2006; and Hanushek, Kain, Rivkin, and Branch, "Charter School Quality and Parental Decision-Making with School Choice," *Journal of Public Economics*, Volume 91 (5-6) June 2007; find charter school students to have a higher rate of attrition than their counterparts in traditional public schools, but a study of middle school students did not find any significant difference (see Nichols-Barrar, Tuttle, Gill, and Gleason, *Student Selection, Attrition, and Replacement in KIPP Middle Schools*, Mathematica Policy Research, 2011).

³This is particularly likely to be the case for elementary school students, as literature documents that families of such students are unwilling to have them travel long distances from home for school. Note, however, that some of New York City's students also attend parochial schools and—to a lesser extent— independent private schools, and some charter schools also draw their students from these schools.

⁴New York's charter law requires charter schools in New York City to give preference to students who reside in the local Community School District in which the charter school is located, see New York State Education Law § 2854 2. (b).

⁵The traditional public schools that belong to a charter school's comparison group are generally unique. However, 21 traditional public schools belong to the comparison group for two separate charter schools, and 6 traditional public schools each belong to the comparison groups for three charter schools.

⁶The second half of the 2000s was a period of rapid growth of charter schools in New York City. For example, 18 charter schools started operating during 2007-2008, and more expanded their grade spans. By contrast, there were only 17 charter schools overall operating in New York City when Mayor Michael Bloomberg took office in 2002 (see Winters, "Measuring the Effect of Charter Schools on Public School Student Achievement in an Urban Environment: Evidence from New York City," *Economics of Education Review*, Volume 31, Issue 2, April 2012).

⁷For the small number of schools with missing x and y coordinates the NYCgbat program was used to transform the street address into x and y coordinates.

⁸Note that this difference in racial composition is unlikely to stem from differences in composition of the respective neighborhoods, as this brief only compares charter schools with their three geographically closest traditional public schools.

⁹Though students who do not return valid forms regarding their family's income level are classified as "full price" by the New York City DOE, our data allow us to identify those students who actually submitted a valid form indicating their ineligibility for the free/reduced-price lunch program and it is these data that this brief uses. Note that full price means that the family has reported income above the 185 percent of poverty level threshold for meal subsidy.

¹⁰See the reports by the New York City Charter School Center (2013) and Winters's (2013) for the Center on Reinventing Public Education.

¹¹We restrict our attention to the 2,656 students still continuing in the city's public schools after three years, rather than the full population of 3,043 students, since there are no data on special education status for those 387 students who had left New York City public schools.

¹²See the reports by the New York City Charter School Center (*Students with Special Learning Needs and NYC Charter Schools, 2012-2013*, www.nyccharterschools.org/sites/default/files/resources/SpecialNeedsFactSheetApril2013.pdf) and Winters for the Center on Reinventing Public Education (*Special Education and New York City Charter Schools*, www.crpe.org/publications/why-gap-special-education-and-new-york-charter-schools).

¹³The share of special education students is very high among those repeating a grade.

¹⁴The measures of student achievement that this brief uses come from the results of standardized tests administered by New York State—it focuses on test results from grade 3 in 2011-2012. Student performance on the test is translated into an overall scale score—scale scores ranged from 644 to 780 for English Language Arts and 662 to 770 for mathematics in 2011-2012 (see <https://reportcards.nysed.gov/statewide/2012statewideRC.pdf>). Performance is also assessed in terms of performance level descriptors as follows. For more details see *The New York State Report Card* for NYC Chancellor's Office (2011-2012), available at <https://reportcards.nysed.gov/files/2011-12/RC-2012-300000010000.pdf>:

English Language Arts **Level 1: Below Standard**

Student performance does not demonstrate an understanding of the English language arts knowledge and skills expected at this grade level.

Level 2: Meets Basic Standard

Student performance demonstrates a partial understanding of the English language arts knowledge and skills expected at this grade level.

Level 3: Meets Proficiency Standard

Student performance demonstrates an understanding of the English language arts knowledge and skills expected at this grade level.

Level 4: Exceeds Proficiency Standard

Student performance demonstrates a thorough understanding of the English language arts knowledge and skills expected at this grade level.

Mathematics

Level 1: Below Standard

Student performance does not demonstrate an understanding of the mathematics content expected at this grade level.

Level 2: Meets Basic Standard

Student performance demonstrates a partial understanding of the mathematics content expected at this grade level.

Level 3: Meets Proficiency Standard

Student performance demonstrates an understanding of the mathematics content expected at this grade level.

Level 4: Exceeds Proficiency Standard

Student performance demonstrates a thorough understanding of the mathematics content expected at this grade level.

¹⁵The first time these students are observed taking the New York State tests is when they are in grade 3 in 2011-2012 (spring 2012).

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