

Are Low-Performing Students More Likely to Exit Charter Schools? Evidence from New York City and Denver, Colorado

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### **Abstract**

A common criticism of charter schools is that they systematically remove or “counsel out” their lowest performing students. However, relatively little is currently known about whether low-performing students are in fact more likely to exit charter schools than surrounding traditional public schools. We use longitudinal student-level data from two large urban school systems that prior research has found to have effective charter school sectors—New York City and Denver, Colorado—to evaluate whether there is a differential relationship between low-performance on standardized test scores and the probability that students exit their schools by sector attended. We find no evidence of a differential relationship between prior performance and the likelihood of exiting a school by sector. Low-performing students in both cities are either equally likely or less likely to exit their schools than are student in traditional public schools.

**Keywords:** educational economics; school choice; charter schools

**JEL:** I20; I28;

**Acknowledgements:** We would like to thank the Denver Public School System for providing the data necessary for this paper, and we especially appreciated the assistance of Josh Drake, Yu-lu Hsiung, and Alisha Anuscencion. Funding for this project comes from the Searle Charitable Trust. We thank the Foundation for its support, but acknowledge that the findings and conclusions presented are our own and do not necessarily represent those of the Foundation. All remaining errors are our own.

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## INTRODUCTION

In recent years, studies of educational policy have examined how incentives contained within policies have evinced potential or actual behaviors on the part of school personnel. Jacob (2005), for instance, analyzed the incentives codified in high-stakes testing policies and discovered teachers responded strategically to improve test scores by increasing special education placements, preemptively retaining students, and placing greater classroom emphasis on subjects covered in high-stakes tests and away from low-stakes subjects like science and social studies.

An educational policy of particular interest in this milieu has been school choice. In her discussion of the policy theories of school choice, Weiss (1998) sketches out the essential premises of choice as an intervention and the role incentives play: Poor educational results stem from school leaders and teachers who face little pressure to improve; choice policies enable parents to choose from among schools, thereby providing an incentive for school personnel to produce superior outcomes—generally measured by test scores—to attract and retain families. A central assumption in this theory is that school personnel will seek to generate the best possible educational outcomes by maximizing their organizations' effectiveness (Friedman, 1955, 1962; Friedman & Freidman, 1980). Yet, some scholars have expressed concern that market-incentives may compel school personnel to pursue means of generating high test scores other than organizational performance, mechanisms such as manipulating the composition of student bodies (Lubienski, 2005; Lubienski, Gulosino, & Weitzel, 2009).

The most recent of such discussions has focused on charter schools. As public schools of choice, charter schools enable parents to send their children somewhere other than a neighborhood school run by the local school district. As such, charter policies are designed to introduce into the educational system the incentives discussed above. Although self-evident, it is nevertheless worth noting that all the schools in an educational marketplace—charters as well as traditional public schools—compete for students, which means schools of choice face the same incentives—likely at an even greater intensity—to produce superior outcomes. A persistent question is whether schools respond to those policy incentives by discriminatorily manipulating student enrollments to affect aggregate outcomes.

Of specific concern is whether charter schools—whose existence depends entirely on the ability to attract and retain students—“push out” certain groups of students (Zimmer & Guarino, 2013). The theorized motivation to do so is improving the school’s academic profile and minimizing costs by pushing out low achieving and educationally challenging students (Zimmer & Guarino, 2013). Prominent charter school critic Diane Ravitch, as just one example from many, has written that, “(Charter schools) are also free to push out low-scoring students and send them back to the local public schools. This improves their results, but it leaves regular public schools with disproportionate numbers of the most challenging students”

(<https://groups.yahoo.com/neo/groups/nyceducationnews/conversations/topics/43167>, para. 7).

This common critique of charter schools was given additional weight when it was recently raised by New York City school’s chancellor (<http://ny.chalkbeat.org/2014/11/20/farina-implies-some-charter-schools-boosting-scores-by-pushing-out-students/#.VJmrel4DrE>).

Yet, little is currently known about the factors that predict student mobility out of charter schools, particularly as it relates to similar attrition out of traditional public schools. Is it in fact

the case that low-performing students are particularly likely to exit charter schools? To date, research provides surprisingly little evidence addressing that important question.

Along with the policy consequences of charter schools artificially improving their aggregate test score performance through student attrition, understanding student mobility is an additionally important issue because mobility compromises effective student learning (Heinlein & Shinn, 2000; Rose & Bradshaw, 2012; Scherrer, 2013) and school accountability (Finch, Lapsley, & Baker-Boudissa, 2009), making it a particularly relevant topic for policymakers and educational leaders (Dauter & Fuller, 2011).

In this paper, we use student-level longitudinal data from two large urban school districts with growing and effective charter sectors—New York City and Denver, Colorado—to expand upon recent research comparing whether low-performing students are more likely to exit charter schools than they are to exit traditional public schools.

Although they differ somewhat, our results are generally consistent across these two very disparate urban public school systems. We find that low-performing students are more likely to exit charter schools than are higher-performing students. However, this pattern is statistically indistinguishable from the exiting patterns seen within the local traditional public school system. Overall, in both cities we find that low-performing students in charter schools are either as likely or less likely to exit their school than are low-performing students in traditional public schools. Although this paper does not directly analyze the motivation behind student exits, these findings are generally inconsistent with the argument that charter schools systematically push out low-performing students.

## WHAT PRIOR LITERATURE SUGGESTS

A small literature has recently emerged evaluating the characteristics of students who exit charter schools. Those concerned about charters “pushing out” students are particularly attuned to differences based on academic performance, but mixed results provide little consensus. Finch et al. (2008), for example, found students with *higher* test scores were more likely to exit Indiana charter schools. Miron, Cullen, Applegate, and Farrell (2007) examined the exit patterns of charter students in Delaware and likewise found leavers at the elementary level reported higher test scores than students who remain in the charter schools, but in other grades patterns differed. No notable differences appeared at the middle school level, and leavers had lower test scores than stayers at the high school level. Considering another type of school choice Cowen, Fleming, Witte, and Wolf (2012) find that lower performing students are more likely to exit private schools where they had used a voucher to pay for tuition.

To date, Zimmer and Guarino (2013) provide the only empirical analysis of which we are aware comparing exit rates of low-performing students in charters and traditional public schools (TPS) for an entire large school district. Their results from an anonymous large school district in the Midwest indicated that although students transferring out of charter schools report slightly lower achievement levels, the same holds true for TPSs. Moreover, when analyzed in formal regression models, the authors found little evidence that low-performing students are more likely to transfer out of charter schools than above-average students or that they are more likely to transfer out of charters than TPSs. Although their results are convincing for the school district they analyze, Zimmer and Guarino call for similar work in other cities in order to determine whether the results are robust across the charter school sector. Such replications in other

jurisdictions are particularly important when studying charter schools because their operation and effectiveness varies dramatically across school systems.

Of the small literature that has considered the characteristics of families that leave charter schools, some studies have focused on personal characteristics of families and students, such as income levels or race/ethnicity. Others have focused on school quality. Of the personal characteristics, prior results find no difference in exit rates based on family income (Hanushek, Kain, Rivkin, & Branch, 2007), but racial and ethnic minority students appear more likely than their white counterparts to exit charter schools (Finch et al., 2009). Finch et al. (2008), for example, discovered non-white families in Indiana were twice as likely to leave their charter schools as white families. Others have found the differences are not limited to white versus nonwhite. Hanushek, Kain, and Rivkin (2004) and Booker, Zimmer, and Buddin (2005), for instance, found African American families more than white or Hispanic families were more likely to exit charters in Texas and an unnamed school district respectively. Similarly, Dauter and Fuller's (2011) findings from Los Angeles suggest differences manifest between Hispanic students and their white and Asian peers, where the former exit more often than the latter.

Some prior research has looked particularly at the mobility of students with classifications that suggest they present unique challenges or costs to educate. Contrary to conventional wisdom, that research suggests mobility of students with special needs (Dauter & Fuller, 2011; Winters, 2013, 2015) and English language learners (Winters, 2014) are significantly less likely to exit charter schools than they are to exit traditional public schools, at least in the urban districts analyzed.

Finally, Hanushek et al. (2007) suggest the decision to leave a charter school may be more a function of the quality of the school. In a study of Texas schools, they found that higher

achieving charter schools have lower exit rates than lower achieving charter schools, a pattern that was also evident among TPS. The state-derived performance rating was significantly related to the probability of exit for both regular and charter schools, but the effect sizes tended to be much larger for students attending charter schools.

Such findings provide an important initial consideration of the type of student who exits charter schools, but the mixed results and the limited number of studies mean much is left to know about the mobility of students in and out of charter schools. To that end, we contribute a study of charter school leavers in two large urban districts not unfamiliar with assertions of charter school cherry-picking (Gabor, 2014).

## **METHODS**

### **Research Questions**

The research was guided by the following questions:

- (1) Is there a differential relationship between a student test score in the prior year and the probability that she exits a charter or a traditional public school?
- (2) Are low-performing students more likely to exit charter schools than they are to exit traditional public schools?

Although those two research questions appear very similar, they are substantially different. The first research question speaks exclusively to the specific statistical relationship between test scores and probability of exit. The second research question, however, further takes into consideration across-sector differences in the probability of exit that are independent of the relationship with prior test scores.

### **Study Context and Sample**

*New York City*



Charter schools have rapidly expanded in New York over the past decade. As of 2014, there were 197 charter schools serving approximately 83,200 students (<http://www.nyccharterschools.org/sites/default/files/resources/NYC-Facts-OCT-2014-15.v3.pdf>). Another estimated 49,700 students applied to a New York City charter school but were denied due to a lack of available seats. Charter schools are located in every borough of New York City, but there are larger clusters of schools in a few neighborhoods with historically underperforming district public schools, most notably Harlem and the South Bronx.

Although the effectiveness of charter schools across the nation appears to vary markedly depending on location, prior research demonstrates that the average student attending a New York City charter school performs better on standardized tests than she would have had she been enrolled in a district-run public school (Hoxby, Murarka, and Kang 2009; Dobbie and Fryer 2011; Dobbie and Fryer 2009; CREDO 2013). Additional empirical research demonstrates that the growth of New York City's charter sector has had a small positive impact on student performance in the traditional public schools from which it draws students (Winters, 2012).

New York charter school law (<http://www.nyccharterschools.org/resources/charter-schools-act-1998-new-york-state-amended>) permits three entities to authorize charter schools: the New York State Department of Education, the State University of New York, and the New York City Department of Education. Unlike traditional public elementary schools to which students are assigned based on their address, charter schools accept applications each spring for students planning to enroll in the fall. If more students apply to attend a charter school than are seats available, the school is required to enroll students according to a randomized lottery. Students with siblings already enrolled in the school are given preference for enrollment.

Though it was recently changed, during the time period analyzed in this paper the primary school accountability system in New York City took the form of Progress Reports. Schools earned points according to a metric that took into account student performance and gains on standardized tests, with additional points given for making gains for particular categories of students. Schools also earned points for having a strong environment, as measured by student, parent, and teacher surveys. These points were then translated into a letter grade – from A to F – for each school. These letter grades were widely publicized in the press. Policymakers also warned that schools that received multiple D or F grades could be subject to closure, and in fact many such schools were closed.

#### *Denver, Colorado*

Colorado's school performance framework places an emphasis on four key performance indicators: academic growth, academic achievement, academic growth gaps, and postsecondary workforce readiness. Each performance indicator is rated to form an overall school performance plan type: performance, improvement, priority improvement, and turnaround. Schools placed on turnaround status must submit annual plans to the state and face additional monitoring requirements for a period of three years. Turnaround schools that fail to meet performance indicators required to move to turnaround may be closed or reconstituted as charters.

The Colorado Legislature adopted its charter law in 1993 (Carpenter & Kafer, 2013), only two years after the nation's first charter law was adopted in Minnesota (Carpenter & Noller, 2010). More than 80,000 students attend around 200 charter schools in Colorado, which represents approximately 10% of the state's public school enrollment. If all of the charter schools were combined into an imaginary district, the enrollment of that district would be the second largest in the state (Carpenter & Kafer, 2013).

Charter school authorizers in Colorado include local school districts and the Charter School Institute, a non-district, statewide organization. Although the formation of charter schools in districts has historically often been adversarial between school founders and district boards, DPS encourages and facilitates the formation of charters in its district through its Office of School Reform and Innovation (<http://osri.dpsk12.org/>), fulfills its authorizer role by holding charter schools accountable to performance metrics and their contracts (<http://osri.dpsk12.org/quality-assurance-accountability/>), and promotes charter schools among its other schools when enabling parents to choose their children's schools (<http://osri.dpsk12.org/about-osri/parent-resources/>). Although they have not yet been subjected to a randomized field trial, recent evidence using a propensity score matching technique indicates students benefit from attending a Denver charter school relative to how they would have performed in an area traditional public school (Cremata et al., 2013).

### **Data and Variables**

We use longitudinal student-level administrative data provided by Denver Public Schools and New York City Department of Education. We utilize six years of data for each school system: from school years 2006-07 through 2011-12 in New York City and from years 2007-2008 through 2012-2013 in Denver. Unique (albeit anonymous) student identifiers allow individual students to be tracked over time. Similarly, unique school markers identify whether students are enrolled in charter or traditional public schools. Data include students' demographic information and relevant test scores on state-mandated math and reading/ELA assessments. For each school system we use test scores from grades three through eight.

Our main analysis focuses on a single measure of student achievement by combining test scores in math and reading/ELA. To make this measure, we first add together each student's

math and reading/ELA score. We then standardize the resulting combined test score by grade and year. In addition, we also present analyses that focus on an indicator for whether the student scored below the test's measure for proficiency on the math or reading/ELA tests separately.

As Table 1 indicates, student characteristics in the charter and traditional public school sectors differ between the cities examined. In New York City, charter schools enroll substantially larger percentages of minority students, although fewer students are eligible for free or reduced priced lunch or have an IEP. In Denver, the students served in both types of schools are quite similar in many respects, such as ELL status, those who qualify for free or reduced lunch, and those with IEPs. Denver charters enroll greater percentages of male, white, and black students, while non-charter public schools serve greater percentages of Hispanic students. Across both school types in Denver, Hispanic students represent the greatest percentage of students in DPS by race/ethnicity, and approximately two-thirds of students in DPS schools qualify for free or reduced lunch.

[TABLE 1 ABOUT HERE]

We analyze whether the student is in a different school than the prior year when she is enrolled. We exclude students attending the final grade level offered in their particular school, accounting for non-traditional grade-spans such as K-8. We also exclude third grade because in each system testing begins in the third grade, and thus we do not observe their test scores in the prior year (i.e., grade two). We also exclude students in schools that closed, who were thus required to change schools.

The study's dependent variable was an indicator for whether a student was observed to have exited her school for another school in the district at the end of a school year. We exclude

students who exit the district altogether because such exits are more likely to be driven by movement out of the area rather than anything that has happened in the school.<sup>1</sup>

The independent variables in the study included whether a student was enrolled in a charter upon exiting, the academic performance of each student in the prior year relative to the district and school averages respectively, student race/ethnicity, gender, status as an English language learner,<sup>2</sup> IEP status (i.e., whether a student receives special education services), and qualification for the federal free and reduced lunch program as an indicator of family economic status.

### Analysis

Our primary analysis used a linear probability model to measure the relationship between observed student characteristics and the probability of exiting their school. Formally, we use OLS to estimate<sup>3</sup>:

(1)

$$exit_{igst+1} = \alpha_0 + \alpha_1 charter_{igst} + \alpha_2 X_{igst} + \alpha_3 Y_{igst} + \alpha_4 (charter * Y)_{igst} + \lambda_t + \delta_g + \varepsilon_{igst}$$

(2)

$$exit_{igst+1} = \beta_0 + \beta_1 charter_{igst} + \beta_2 X_{igst} + \beta_3 belowtest_{igst-1} + \beta_4 (charter * belowtest)_{igst} + \lambda_t + \delta_g + \mu_{igst}$$

where  $exit_{igst+1}$  is an indicator that equals one if student  $i$ , in grade  $g$ , and school  $s$ , was observed to have exited his school in year  $t+1$ ;  $charter$  is an indicator for whether the student's school in year  $t$  was a charter;  $X$  is a vector of observed student characteristics;  $Y$  is the student's observed test score;  $below\ test$  is an indicator for whether the student's test score is below a particular

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<sup>1</sup> Results are similar if we include students who exit the system.

<sup>2</sup> Status as an English language learner is only used as an independent variable in the Denver analysis. The New York City dataset in our possession does not contain reliable information about ELL status prior to 2008.

<sup>3</sup> Results are similar when estimated via Probit.

chosen threshold (described below);  $\lambda$  and  $\delta$  are year and grade fixed effects;  $\varepsilon$  is a stochastic term; and the  $\alpha$ 's and  $\beta$ 's are parameters to be estimated. Standard errors are clustered by school.

One difficulty with analyzing the attrition patterns of low-performing students in the framework of (2) is that there are multiple ways to define low-performance. For this paper, we choose three main strategies. The first classifies a student as “low-performing” if her test score falls below the average test score in the district among students in the same grade and year. This definition essentially holds all students in the district to the same academic standard. The second strategy classifies a student as low-performing if her test score falls below the average for other students attending the same school, grade, and year. In order to focus on the lowest performing students, we also alter the definition of low-performing to consider the attrition patterns of students whose test scores are below the 25<sup>th</sup> percentile within the state. Finally, we characterize students as low performing if they score below the proficiency benchmark in math, reading/ELA, or both.

We can address our first research question—Is there a differential relationship between a student test score in the prior year and the probability that she exits a charter or a traditional public school?—by considering the direction and significance of  $\alpha_4$  and  $\beta_4$ . These coefficient estimates represent the differential relationship between our measure of prior test score performance and the probability of exiting a charter school relative to the probability of exiting a traditional public school.

We can address our second research question—Are low-performing students more likely to exit charter schools than they are to exit traditional public schools?—by further analyzing the results of Equation 2. The analysis requires taking the sum of the differential relationship between prior low-performance and exit within charter schools ( $\beta_4$ ) and the effect of attending a

charter school itself ( $\beta_1$ ). If this sum is statistically different from zero, then we would conclude that low-performing students are more likely to exit charter schools than they are to exit traditional public schools.<sup>4</sup> This relationship is tested via an F-test.

To be clear, the analysis described is entirely descriptive. We make no causal claims. For instance, our analysis does not allow us to determine whether attrition levels would change if student achievement were to increase or decrease in either sector. However, from a policy perspective, such a descriptive analysis is very useful in order to understand the type of student who exits a charter school and thus consider whether real patterns are consistent with claims that low-performing and otherwise difficult-to-educate students exit charter schools at worrisome rates.

## RESULTS

We first consider graphical evidence regarding the relationship between test score performance and the probability of exiting by sector. Figures 1 and 2 illustrate the proportion of fourth grade students who exited a New York City or Denver school by decile of their combined math and reading score by sector. The figures appear to show that low-performing students are more likely to exit their school than are higher performing students. However, the figures appear to show very little discernable difference in this relationship across sectors.

[FIGURES 1 – 4 ABOUT HERE]

In order to consider whether some charter schools have particularly high levels of attrition, Figures 3 and 4 compare exits rates at each charter school in New York City and Denver, respectively. The figures show some variation in the proportion of students who exit

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<sup>4</sup> From (2), all else held constant, the exiting probability of a low-performing student in a traditional public school is found from  $\beta_3$ , and the exiting probability of a low-performing student in a charter school is represented by  $\beta_1 + \beta_3 + \beta_4$ . Subtracting the exiting probability from a TPS from the exiting probability in charter yields:  $\beta_1 + \beta_3 + \beta_4 - \beta_3 = \beta_1 + \beta_4$ .

particular charter schools. In Denver, there appears to be particularly little difference in the attrition rates of most individual charter schools. There is a wider variation in attrition rates in New York City charter schools. However, other than a few outliers, exit rates at the majority of New York City charter schools are within reasonably expected levels.<sup>5</sup>

[FIGURES 3 AND 4 ABOUT HERE]

Though informative about general correlations, the figures are limited in that they do not provide for statistical controls or allow for inference. We now present results from regression models. We then provide graphical illustrations of the relationships under consideration, which provide important further context for understanding the empirical results.

Table 2 presents results from estimating (1) and various versions of (2) in New York City. Consistent with expectations, in each case, there is a significant negative relationship between the student's test score and the likelihood that she exits the school. Further, students attending charter schools and not in the belowtest category are less likely to exit than are students in traditional public schools. In all cases except one, however, the coefficient on the interaction term between prior test score and charter attendance is statistically insignificant, despite the fact that the relatively small standard errors suggest that the relationship is estimated precisely enough to detect meaningful effect sizes. Thus, we find no difference in the relationship between prior test scores and the probability of exit across sectors.

[TABLE 2 ABOUT HERE]

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<sup>5</sup> What has caused higher attrition rates at these three outlier schools is unclear and is not an area for consideration in the paper. One of the three schools was closed in a year following the analysis in this paper, in part for poor performance. The other two schools, however, received grades of B on the city's accountability system, suggesting that their performance is relatively high relative to other district schools.



The rows in the bottom of the table address the second research question. The cells report the sum of the Charter School and Prior Year and the Interaction coefficients for each respective analysis. The p-values resulting from F-tests test the null hypothesis that the sum of these coefficients differs from zero. In each case, the sum of the coefficients is negative, indicating that low-performing students in New York City charter schools are significantly less likely to exit their school than those in traditional public schools. The magnitude of the results suggests that low-performing students in New York City are about five percentage points less likely to exit their school than are low-performing students attending traditional public schools.

Table 3 follows the same format to present regression results from Denver. As was the case in New York City, in Denver students who were in charters and not in the belowtest category are less likely to exit than their peers in traditional public schools. Low performing students are also more likely to exit their school than are higher performing students. However, similar to New York, in most cases the interaction term is statistically insignificant, indicating no differential relationship between being low-performing student and probability of exit across sectors. In each case, the standard errors are small enough that the model could detect as significant meaningful effect sizes.

[TABLE 3 ABOUT HERE]

The sum of the Charter and interaction coefficients are again presented at the bottom of the table in order to address the second research question. In several of the models, when we sum Charter School and Interaction terms we find no statistical difference in the likelihood that low-performing students exit Denver charter schools than the city's traditional public schools. Where these F-tests are statistically significant, the sum of the charter school variable and the interaction term is again negative, indicating that low-performing students in charter schools are statistically

less likely – by about 3 to 4 percentage points --to exit than are low-performing students in traditional public schools.

## **CONCLUSION**

For those concerned that charters respond to policy incentives by encouraging greater student mobility, these results suggest that is not the case in Denver or New York City. Contrary to research from the past several years (Dauter & Fuller, 2011; Finch et al., 2009; Finch et al., 2008; Hanushek et al., 2007; Karp, 2010; Powers, Topper, & Silver, 2012), results from the present study indicate students in these two large urban school systems are overall either equally or less likely to exit charter schools than they are to exit traditional public schools, holding other factors constant.

Low-performing students are on average more mobile than their higher-performing counterparts. However, we find no meaningful differential relationship between prior test scores and attrition across sectors. Further, when we take into account that charter school students are overall less likely to exit their school than are traditional public school students, we find that low-performing students are equally likely or less likely to exit the charter sector.

Our results from New York City and Denver are very similar to those reported for an anonymous school district in the Midwest by Zimmer and Guarino (2013). Of course, charter school sectors differ substantially by locality, and thus exit patterns could also vary in other cities. However, that research now finds consistent results across three urban school systems suggests that they might hold more generally.

Thus, if attrition of low-performing students is worrisome for charter schools as evidence of school “pushing out” students, it appears to be at least as worrisome for traditional public schools. We hasten to add, however, that these results do not provide evidence that schools are or

are not affirmatively pushing any students out. The analyses in this paper are not able to determine whether and how many students have been inappropriately removed from either sector in part because of their low test score performance. Additional research within schools is needed in order to understand what goes on within that black box. Nonetheless, our analyses do suggest that persistent claims that urban charters systematically remove low-performing students—whether directly or indirectly, through “counseling out”—are likely, at the very least, overstated.

Finally, the prevailing assumption throughout this study has been that student mobility is a harmful and undesirable phenomenon. As Dauter and Fuller (2011) discuss, however, increased migration may be a positive trend. Consistent with the policy theories of school choice (Weiss, 1998), greater rates of mobility may be an indicator of parents seeking schools—whether charter, TPS, magnet, or private, in the case of voucher or tax credit programs—that provide the best “fit” for their needs of their children. Indeed, larger districts, both urban and suburban, including DPS, now actively facilitate this kind of mobility, seeing parental choice as a means to retaining families, catalyzing innovation, and increasing quality and student performance (in DPS, see, for example, <http://static.dpsk12.org/gems/osri/CallforNewQualitySchools2013final.pdf>). What remains unclear is what amount or part of mobility is productive and what is disadvantageous. As scholarship on mobility and charter schools, or any type of choice, progresses, future research measuring, defining, and differentiating productive from disadvantageous mobility would be beneficial, particularly as a means of evaluating a policy intervention that is consequential and increasing in adoption across the states (Carpenter & Kafer, 2012; Friedman Foundation for Educational Choice, 2014).



### References

- Booker, K., Zimmer, R., & Buddin, R. (2005). The effect of charter schools on student peer composition. Rand Education.
- Carpenter, D. M., & Kafer, K. (2012). A history of private school choice. *Peabody Journal of Education*, 87, 336-350.
- Carpenter, D. M., & Kafer, K. (2013). The state of charter schools. Denver, CO: Colorado Department of Education.
- Carpenter, D. M., & Noller, S. (2010). Measuring charter school efficiency: An early appraisal. *Journal of Education Finance*, 35(4), 398-416.
- Cowen, J. M., Fleming, D. J., Witte, J. F., & Wolf, P. J. (2012). Going public: Who leaves a large, longstanding, and widely available urban voucher program? *American Educational Research Journal*, 49(2), 231-256.
- Cremata, E., Davis, D., Dickey, K., Lawyer, K., Negassi, Y., Raymond, M. E., & Woodworth, J. L. (2013). National charter school study. Stanford, CA: Center for Research on Education Outcomes.
- Dauter, L., & Fuller, B. (2011). How diverse schools affect student mobility: Charter, magnet, and newly built institutions in Los Angeles. Berkeley, CA: University of California.
- Finch, H., Lapsley, D. K., & Baker-Boudissa, M. (2009). A survival analysis of student mobility and retention in Indiana charter schools. *Education Policy Analysis Archives*, 17(18), 1-18.
- Finch, W. H., Baker-Boudissa, M. E., & Cross, T. L. (2008). Predictors of student mobility and retention in Indiana charter schools: 2003 to 2006. Muncie, IN: Ball State University.

- Friedman Foundation for Educational Choice. (2014). *The ABCs of school choice*. Indianapolis, IN: Author.
- Friedman, M. (1955). The role of government in education. In R. A. Solo (Ed.), *Economics and the Public Interest* (pp. 123-144). New Brunswick, NJ: Rutgers University Press.
- Friedman, M. (1962). *Capitalism and freedom*. Chicago: University of Chicago Press.
- Friedman, M., & Freidman, R. (1980). *Free to choose*. New York: Harcourt, Brace Jonanovich.
- Gabor, A. (2014, April 5). Charter school refugees, *New York Times*, p. A21.
- Hanushek, E. A., Kain, J. F., & Rivkin, S. G. (2004). Disruption versus Tiebout improvement: the costs and benefits of switching schools. *Journal of Public Economics*, 88(9-10), 1721-1746.
- Hanushek, E. A., Kain, J. F., Rivkin, S. G., & Branch, G. F. (2007). Charter school quality and parental decision making with school choice. *Journal of Public Economics*, 91, 823-848.
- Heinlein, L. M., & Shinn, M. (2000). School mobility and student achievement in an urban setting. *Psychology in the Schools*, 37(4), 349-357.
- Jacob, B. A. (2005). Accountability, incentives and behavior: The impact of high-stakes testing in the Chicago Public Schools. *Journal of Public Economics*, 89(5-6), 761-796.
- Karp, S. (2010). One in 10 charter school students transfers out. Retrieved October 9, 2014, from [www.catalyst-chicago.org/news/2010/11/09/one-in-10-charter-school-students-transfers-out](http://www.catalyst-chicago.org/news/2010/11/09/one-in-10-charter-school-students-transfers-out)
- Lubienski, C. (2005). Public schools in marketized environments: Shifting incentives and unintended consequences of competition-based educational reforms. *American Journal of Education*, 111(4), 464-486.

Lubienski, C., Gulosino, C., & Weitzel, P. (2009). School choice and competitive incentives:

Mapping the distribution of educational opportunities across local education markets.

*American Journal of Education*, 115, 601-647.

Miron, G., Cullen, A., Applegate, B., & Farrell, P. (2007). Evaluation of the Delaware charter

school reform. Kalamazoo, MI: Western Michigan University.

Powers, J. M., Topper, A. M., & Silver, M. (2012). Public school choice and student mobility in

metropolitan Phoenix. *Journal of School Choice*, 6, 209-234.

Rose, B., & Bradshaw, C. P. (2012). The link between student mobility and academics. In J.

Hattie & E. M. Anderman (Eds.), *International Guide to Student Achievement* (pp. 155-

157). Oxford, UK: Routledge.

Scherrer, J. (2013). The negative effects of student mobility: Mobility as a predictor, mobility as

a mediator. *International Journal of Educational Policy and Leadership*, 8(1),

<http://journals.sfu.ca/ijepl/index.php/ijepl/article/viewArticle/400>.

Weiss, J. A. (1998). Policy theories of school choice. *Social Science Quarterly*, 79(3), 523-532.

Winters, M. A. (2012). Measuring the systemic effect of charter schools on public school student

achievement in an urban environment: Evidence from New York City. *Economics of*

*Education Review*, 31, 293-301.

Winters, M. A. (2013). Why the gap? Special education and New York City charter schools.

New York: Manhattan Institute for Policy Research and Center for Reinventing Public

Education.

Winters, M. A. (2014). Why the gap? English language learners and New York City charter

schools. New York: Manhattan Institute for Policy Research.

Winters, M. A. (2015). Understanding the gap in special education enrollments between charter and traditional public schools: Evidence from Denver, Colorado. *Educational Researcher*, 44(4), 228-236.

Zimmer, R. W., & Guarino, C. M. (2013). Is there empirical evidence that charter schools “push out” low-performing students? *Educational Evaluation and Policy Analysis*, 35(4), 461-480.



**Tables**

Table 1

*Sample Descriptive Statistics*

	New York City				Denver			
	Charter		TPS		Charter		TPS	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Other race	0.03	0.17	0.15	0.35	0.03	0.18	0.05	0.2
Black	0.65	0.48	0.31	0.46	0.20	0.42	0.15	0.3
White	0.03	0.00	0.14	0.35	0.20	0.40	0.22	0.4
Hispanic	0.28	0.00	0.40	0.49	0.57	0.49	0.59	0.4
Male	0.48	0.50	0.51	0.50	0.52	0.50	0.51	0.5
In ELL program	-	-	-	-	0.23	0.42	0.19	0.3
Free/reduced lunch qualifier	0.75	0.43	0.84	0.37	0.64	0.48	0.65	0.4
Student has IEP	0.12	0.32	0.18	0.39	0.10	0.30	0.11	0.3
Exit	0.09	0.29	0.10	0.30	0.13	0.33	0.17	0.3
Math	0.07	0.80	0.03	0.99	0.05	1.04	-0.23	1.1
Read	0.05	0.78	0.01	1.00	-0.24	1.01	-0.43	1.2
Combined	0.06	0.78	0.00	1.00	0.25	1.63	-0.04	1.9

Table 2

*Regression Results, New York City*

	Combined Standardized Score	Below Median District	Below Median School	Below 25th Percentile District	Below 25th Percentile School	Proficient Math	Proficient Reading
Charter School in Prior Year	-0.0519*** [0.0135]	-0.0482*** [0.0120]	-0.0591*** [0.0125]	-0.0563*** [0.0122]	-0.0589*** [0.0123]	-0.0439** [0.0194]	-0.0508*** [0.0159]
Prior Year Test Score	-0.0182*** [0.00206]						
Belowtest		0.0277*** [0.00285]	0.00440* [0.00247]	0.0396*** [0.00367]	0.0124*** [0.00287]	-0.0354*** [0.00331]	-0.0222*** [0.00232]
Interaction: Prior Year Test Score & Charter School	3.70e-05 [0.00704]						
Interaction: Belowtest * Charter		-0.00837 [0.00961]	0.00845 [0.00546]	0.00149 [0.0155]	0.0178** [0.00798]	-0.00959 [0.0130]	-0.00409 [0.00813]
Observations	1,357,546	1,357,546	1,357,546	1,357,546	1,357,546	1,357,546	1,357,546
R-Squared	0.071	0.071	0.069	0.071	0.069	0.071	0.070
Charter + interaction	N/A	-0.0566	-0.0507	-0.0548	-0.0411	-0.0535	-0.0549
F-Tests (p-value) Charter + Interaction = 0		0.0004	0.0005	0.0243	0.0206	0	0

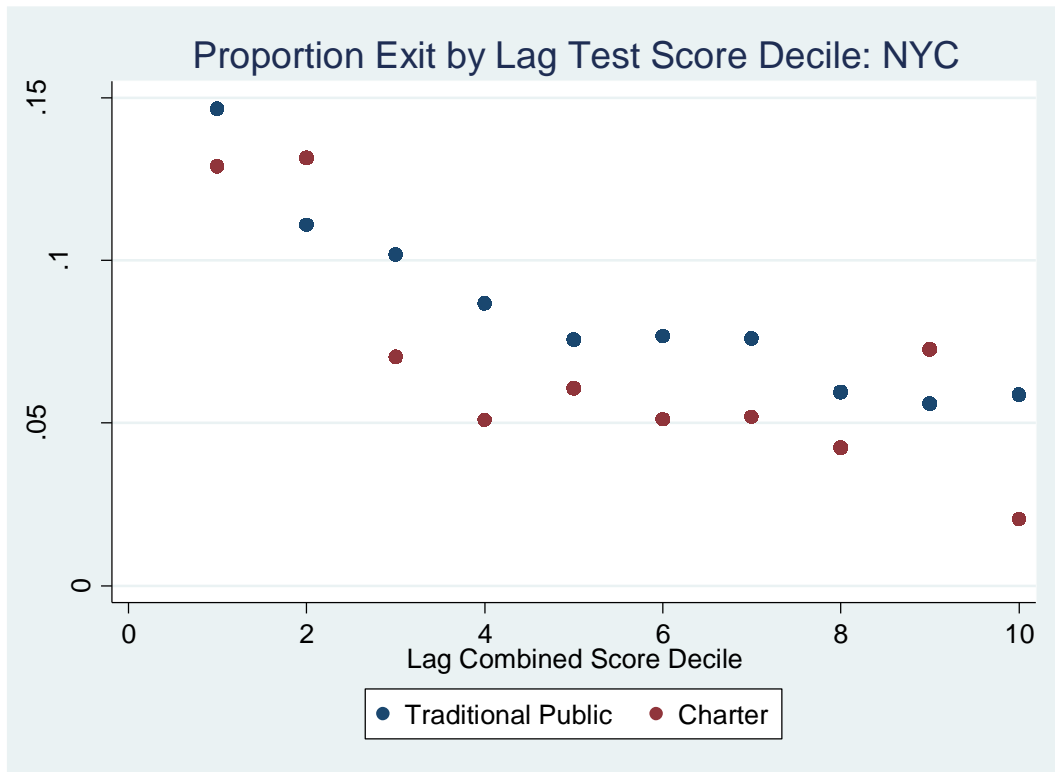
\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

Table 3

*Regression Results, Denver*

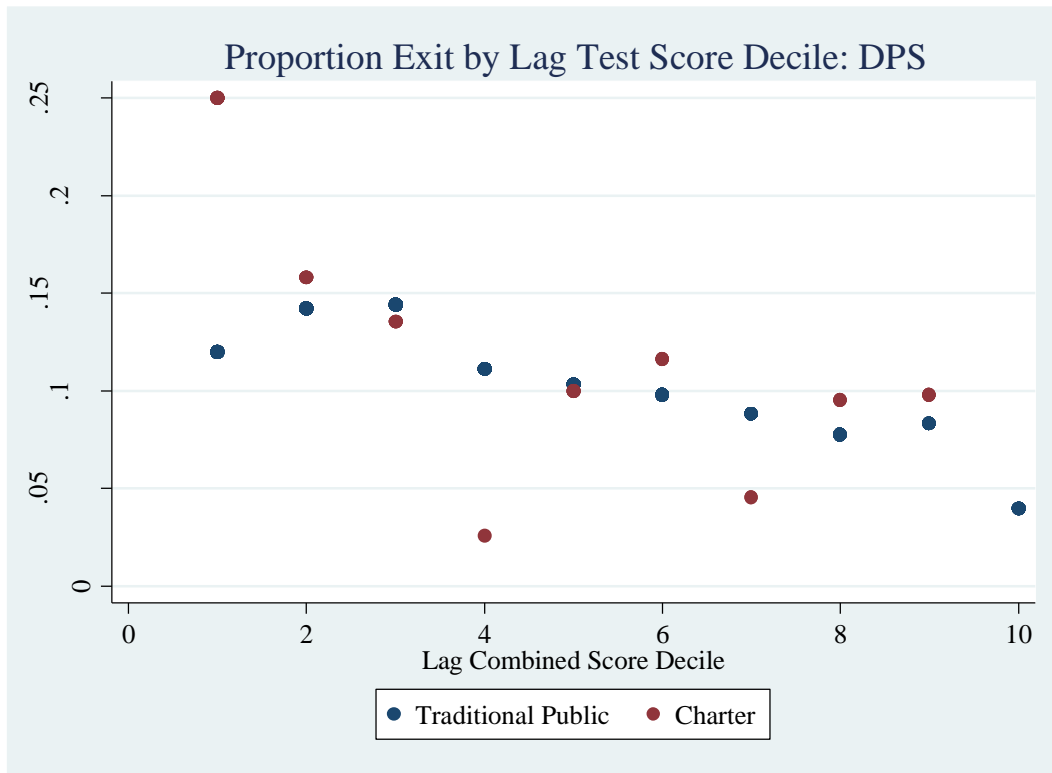
	Combined Standardized Score	Below Mean District	Below Mean School	Below 25th Percentile District	Below 25th Percentile School	Proficient Math	Proficient Reading
Charter School in Prior Year	-0.0308* [0.0167]	-0.0364** [0.0145]	-0.0454*** [0.0139]	-0.0407*** [0.0146]	-0.0355** [0.0164]	-0.0235 [0.0230]	-0.0273 [0.0214]
Prior Year Test Score	-0.00767*** [0.00195]						
Belowtest		0.0154*** [0.00460]	0.00162 [0.0102]	0.0161*** [0.00499]	-0.00175 [0.00438]	-0.0240*** [0.00512]	-0.0229*** [0.00517]
Interaction: Prior Year Test Score & Charter School	-0.00843 [0.00571]						
Interaction: Belowtest * Charter		0.0270* [0.0149]	0.000668 [0.00363]	0.0314* [0.0176]	6.50e-06 [0.00745]	-0.0203 [0.0179]	-0.0132 [0.0138]
Observations	58,329	62,097	62,097	62,136	62,125	61,947	61,811
R-Squared	0.084	0.080	0.081	0.081	0.080	0.082	0.082
Charter + Interaction		-0.0094	-0.0447	-0.0093	-0.0355	-0.0438	-0.0405
F-Tests (p-value) Charter + Interaction = 0	N/A	0.0978	0.0604	0.7278	0.0427	0.3753	0.3505

Figure 1



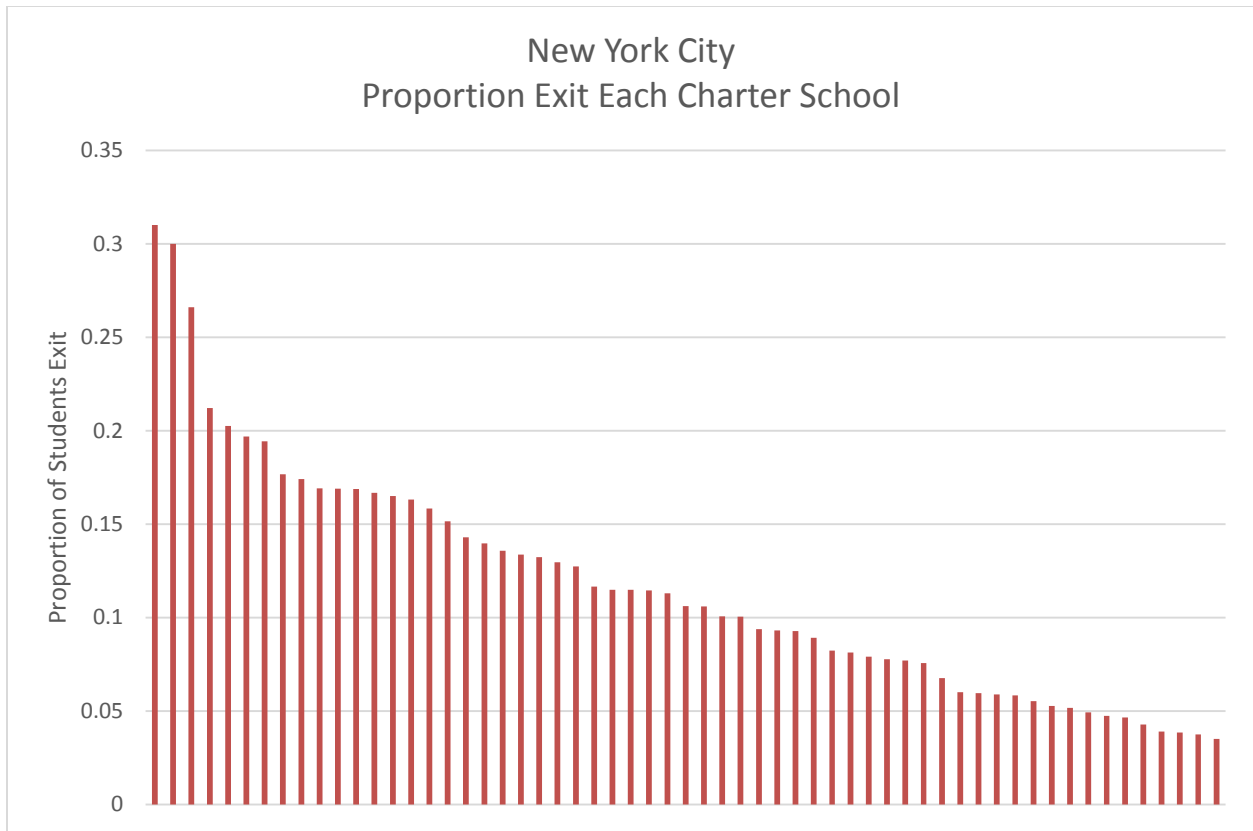
Note: Sample restricted to students observed in fourth grade in 2011.

Figure 2



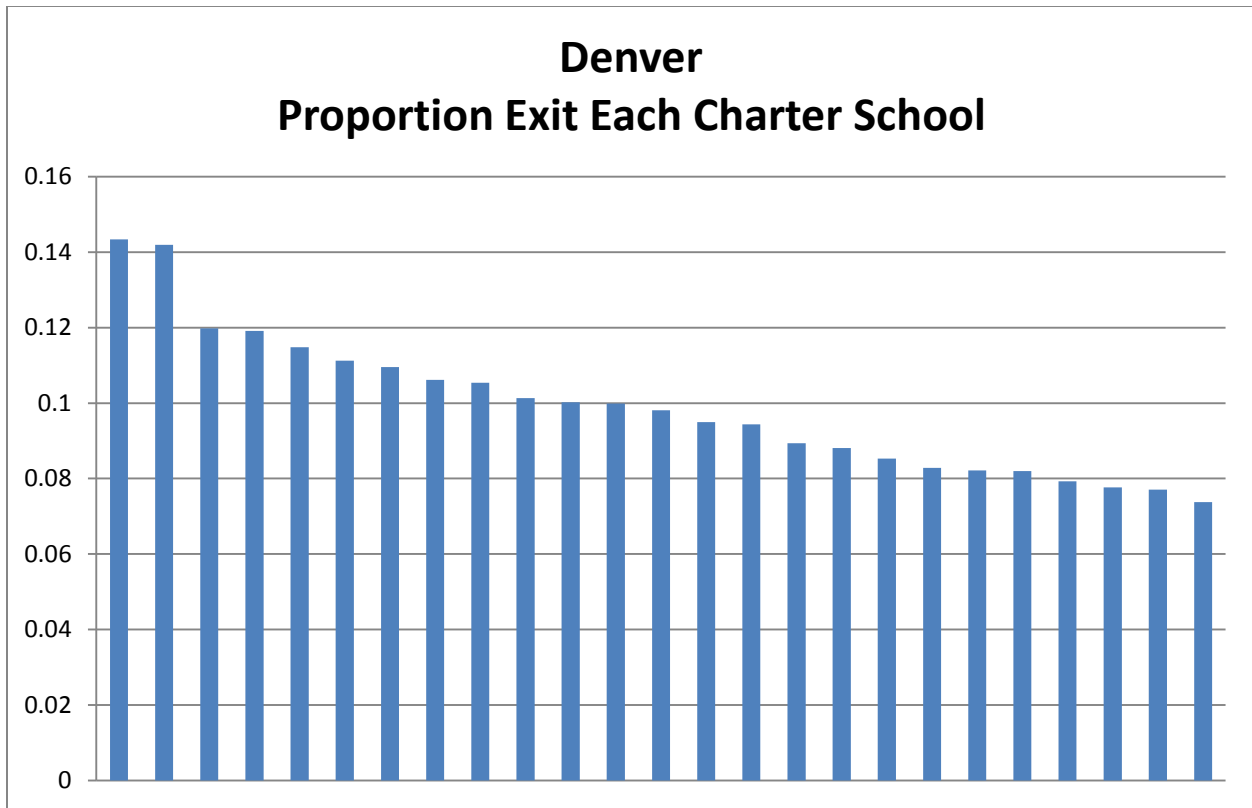
Note: Sample restricted to students observed in fourth grade in 2012.

Figure 3



Note: Each bar represents a particular charter school. Sample includes only students making non-structural moves and those attending school that did not close during the time period considered.

Figure 4



Note: Each bar represents a particular charter school. Sample includes only students making non-structural moves and those attending school that did not close during the time period considered.