

Does Attending a Charter School Reduce the Likelihood of Being Placed into Special Education? Evidence from Denver, Colorado

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Abstract:

We use administrative data to measure whether attending a charter school in Denver, Colorado reduces the likelihood that students are newly classified as having a disability in primary grades. We employ an observational approach that takes advantage of Denver's Common Enrollment System, which allows us to observe each school that the student listed a preference to attend. We find evidence that attending a Denver charter school reduces the likelihood that a student is classified as having a Specific Learning Disability, which is the largest and most subjectively diagnosed disability category. We find no evidence that charter attendance reduces the probability of being classified as having a speech or language disability or autism, which are two more objectively diagnosed classifications.

Introduction

Practically from the advent of charter schools, a primary concern focused on whether these publically funded but privately operated schools of choice were serving similar percentages of students with special needs as compared to surrounding district schools. In 1996, for example, which was just a few years after the first charter law was adopted in Minnesota, McKinney (1996) called charter schools “a new barrier for children with disabilities” (p. 22). Twenty years later, the same concerns were still being voiced in journals (Miron, 2014) and popular media (Banchero & Porter, 2012).

Charter schools do appear, on average, to enroll significantly fewer students with disabilities than do surrounding district schools (Government Accountability Office, 2012; Snell, 2004; Winters, 2015b; see Heilig, 2016 for an exception). There are at least two reasons that this could be a policy concern. First and foremost is the issue of access. As public schools, charters are obligated to serve students under the Individuals with Disabilities Education Act (IDEA), and enrolling lower rates of students with disabilities suggests the possibility that they are neglecting this responsibility. Second, many complain that the fact that charter schools serve such different populations of students tends to exacerbate their observed performance relative to surrounding district schools. That is, charter schools may have an unfair advantage relative to district schools if they serve fewer students with disabilities, who are often more difficult and expensive to educate.

There are three primary factors (with many variants within these factors) that could result in a smaller proportion of students with identified special needs enrolled in charter schools as compared to surrounding district schools: Fewer such students enter charters, disproportionate numbers of them exit charters after they are enrolled, or across-sector differences in the likelihood that a student is classified into or out of special education.

Much of the research on special education gaps has thus far focused on enrollment patterns, with particular attention paid to whether charter schools explicitly or implicitly prohibit students with special needs from entering charters (Ramanathan & Zollers, 1999; Zollers & Ramanathan, 1998) or the degree to which charters “counsel out” students with needs (McKinney, 1998; Rothstein, 1998; Zollers, 2000). Anecdotally, it appears instances of “counseling out,” or attempts to counsel out, have occurred, particularly with regard to students with severe needs (Meyer, 2009). However, to date, evidence about systematic discriminatory practices remains largely absent, and the very few studies draw contradictory conclusions. Rhim, Lange, Ahearn, and McLaughlin (2007), for example, surveyed charter school authorizers—rather than charter schools themselves—and reported that the IEP document, which serves as the basis for receiving special services by students, is often used as the primary source to “counsel out” students from enrolling in charter schools. After reviewing the IEP, the charter school determines if the school is an appropriate placement for the student, and many charters reportedly advise parents to find a different option to serve their child’s needs. In contrast, Estes (2004) found no evidence that the charter schools she studied discriminated against students with disabilities as part of the enrollment process.

To date, research has found little evidence to suggest that students with disabilities are disproportionately likely to exit out of charter schools relative to traditional public schools. In fact, research on charter schools in New York City (New York City Independent Budget Office, 2015; Winters, 2013) and Denver (Winters, 2015b) found that students with disabilities are significantly less likely to exit their school if it is a charter than if it is a district school. Nichols-Barrer, Gleason,

Gill, and Tuttle (2016) found similar results in a national evaluation of the Knowledge is Power Program (KIPP) charter schools.

The final potential factor influencing the special education enrollment gap—differential patterns of classification changes—has thus far received very little attention in the academic literature. This paper attempts to address this important void in the charter school literature.

As discussed in greater detail below, identification is the process by which students are designated to receive special education services. Using various forms of data, a team of educators meets with parents to determine if a student has an identifiable disability and if so how the needs associated with the disability will be addressed. As this description implies, it is a process with a certain amount of subjectivity. Consequently, in one school a student may be identified as requiring special education services, while in a different school that same student may not be so identified.

Whether attending a charter school impacts the probability that a student is placed into special education has important policy implications. Evidence of special education gaps have led to policy decisions that are sweeping in nature but may be ill-designed. In New York, for example, state lawmakers amended the New York State Charter Schools Act in 2010 to include enrollment targets for particular student groups. According to the amended law, charter school authorizers must set enrollment and retention targets for students with disabilities. Yet, if a significant part of the gap results from the ability of charters to educate students without classifying them as special education, then policy efforts meant to increase the percentage of students in charters with special education status could lead to unnecessary disability classifications within the charter sector (Lake, 2014). In addition, if it is the case that charter schools can educate students effectively without the special education classification, it compels one to ask if there are lessons to be learned from the charter sector that could reduce the need to classify students into special education. Similarly, it may also suggest that district schools could be over-identifying students in need of special education. If so, then policy prescriptions aimed at charter schools may be focused on the wrong sector and the wrong problem.

There are at least two reasons we might suspect that attending a charter school could reduce the probability that a student is placed into special education. First, it is possible that charter schools tend to prefer to educate students in regular enrollment environments to a greater extent than do district schools and thus will tend not to classify marginal students. The motivation may be cost—students with disabilities can be costlier to educate (Haveman & Wolfe, 2000; Perna, 2015; Sladea et al., 2009) and charters often operate with comparably fewer fiscal resources (Speakman & Hassel, 2005). Relatedly, charters may avoid IEP classifications because, as Barkmeier (2012) notes, many charter schools lack special education personnel and the resources to hire them. Moreover, due to their autonomous structure, many charter schools may be isolated from the "economies of scale" present in a traditional public school system, such as exchanges of teachers, materials, ideas and other resources. Second, in areas where charter schools are more effective at educating students than are surrounding district schools it is possible that students who would have fallen behind in a district school and eventually classified as having a mild learning disability would not be so identified when they attend a charter school.

To our knowledge, only one empirical paper to date has evaluated the relative proclivity of charter and district schools to place students in special education. Setren (2015) took advantage of enrollment lotteries in Boston and found that among those who applied to charter schools in pre-k or kindergarten, students randomly offered a charter school seat were less likely to be classified into special education by enrollment in October than were those who were not offered a seat. That differences in special education classification rates exist in the fall of the first enrolled year, prior to receipt of much instruction, is consistent with the idea that charters might have a stronger preference than do traditional public schools to serve such students in regular enrollment environments. She also found that students attending charters were more likely over time to be moved into less restrictive special education environments or to be declassified out of special education over time. This result is consistent with the idea that increased school effectiveness might play a role in the classification differences in the charter and traditional public school sectors.

We build upon this early research using data from Denver, Colorado. In particular, we ask: Does attending a charter elementary school in Denver reduce the likelihood that a student entering kindergarten is identified as requiring special education services in early elementary grades? In addition, are there differences in this relationship by particular disability classifications?

To address these questions, we take advantage of a unique administrative dataset. In particular, our identification strategy relies on information from the city's common enrollment system (CES), which allows us to observe each school that a student listed as a preference for enrollment. We argue that this information allows us to hold constant unobserved student factors in a way not available in previous observational analyses of charter school impacts.

Our findings suggest that attending a Denver charter school significantly and substantially decreases the likelihood that a student is classified as having a specific learning disability (SLD), which is not only the largest special education category but also the mildest and most subjectively diagnosed. We fail to find similar impacts for a more severe disability category (autism) or in a category that is more objectively diagnosed (speech or language impairment).

Our estimates are, of course, specific to the context of Denver's school system. This is a limitation given that, as described in later sections, Denver's charter sector is somewhat atypical in its effectiveness and the degree to which charters have agreed to meet enrollment targets for students with special needs. Nonetheless, we present that our results are highly informative to the policy conversation.

First, to the extent that our results could be driven by the academic effectiveness of Denver's charter schools relative to its traditional public schools they would be applicable to other areas with effective charter sectors. Though the literature suggests that charter schools nationwide are equally effective as surrounding traditional public schools, some recent evidence finds benefits from attending urban charter schools in particular (CREDO 2015; Angrist, Pathak, and Walters 2013). For instance, among the 41 urban regions studied by CREDO (2015) 25 were found to have statistically significant positive impacts in math and 23 had significant positive impacts in reading. In both subjects, the positive impact found for Denver in that study was similar to the average effect of attending an urban charter school nationwide. That our results from Denver are consistent with findings from Boston (Setren 2015), another charter sector that research finds to be effective, suggests the potential for a pattern worthy of further research.

Further, our results may become more generalizable as schools and districts adopt policies that are similar to Denver’s approach. In fact, Denver is seen as an exemplar by some policymakers and pundits (see for example, Osborn 2015).

Finally, our results are of policy importance if only because they provide additional evidence regarding the malleability of special education classifications. Our results add to other recent evidence that an intervention with positive academic effects reduces the likelihood that a student is later classified into special education (Maschkin, Ladd, and Dodge 2015). That interventions such as early childhood initiatives or attending a charter school can influence the likelihood that a student is identified as having an SLD suggests that, one way or another, these placements are related to more than just the incidence of an observable disability. Taken seriously, that result could have important ramifications for policymakers interested in special education.

Special Education Identification

Under the IDEA, public schools (including charter schools) are required to provide students with disabilities a free and appropriate public education in the least restrictive environment possible. Doing so generally requires first identifying if a student has a disability and if so classifying the specific disability. This is followed by the creation of a plan—called an Individualized Education Plan (IEP)—to provide the services necessary to help the student succeed academically, physically, socially, occupationally, or in whatever other domain is identified.

There are several steps involved in classifying a student’s disability. First, a parent or educator requests an evaluation, conducted by a district expert, which includes a social history for the child, observations of the student, and any necessary testing. A team of professionals and the parent then meet to determine whether the student fits one of the eligible categories of a disability. If so, the team develops the IEP.

The severity of disability varies both within and across categories. The designation of special education includes services provided to students with potentially severe mental disorders (e.g., intellectual disability, autism, traumatic brain injury); those with communication challenges (e.g., speech or language impairment); and those with emotional or behavioral disorders, physical disabilities (e.g., deaf, visual impairment, orthopedic impairment), or challenges in learning material (e.g., specific learning disability). Some categories have objective definitions and offer little discretion when classifying a student, while other categories rely heavily on subjective judgment and are influenced by the student’s previous academic performance. In particular, the classification of specific learning disability (SLD) is often believed to be primarily determined by low academic achievement (Macmillan & Siperstein, 2001).

Prior to 2004, the process by which students were placed into special education for learning disabilities was based on an identified discrepancy between their IQ and academic performance (O’Donnell & Miller, 2011). Under the 2004 revision of IDEA, the federal government began recommending that states abandon the discrepancy model in favor of “response to intervention” (RTI), by which the school uses a progressive approach to assess whether the student responds to research-based general education interventions prior to classification into special education (U.S. Department of Education, 2006).

Generally, RTI uses a multi-tiered intervention approach to identify academically at-risk students (Carney & Stiefel, 2008). At Tier 1, all students are theoretically provided with quality, research-based instruction in the general education setting. All students are assessed through classroom summative and formative assessments. Students observed to be underperforming relative to expectations with Tier I instruction can be identified to be provided with direct, explicit instruction in their academic area(s) of identified need in Tier II interventions. The instruction differs from classroom instruction in the intensity (teacher-student ratio), frequency (sessions per week), and duration (amount of time per session) of the instruction. Students' response to instruction is monitored by their progress on obtaining proficiency in the identified low academic areas. A student who does not respond may participate in a different intervention, have the intensity, frequency, and/or duration changed, or be referred for a special education evaluation. Special education evaluations and services are typically Tier III of a three-tiered RTI system (Fuchs & Fuchs, 2006; Hughes & Dexter, 2011).

Providing these descriptions of the classification process is more than point of information; it supplies the necessary information to understand how identification is required by law in Colorado. Despite the 2004 IDEA changes, the adoption of RTI did not universally eliminate the use of the IQ discrepancy model in the United States. Methods of special education identification and classification vary across states and school districts. This is because federal law left to the states the autonomy to decide how to determine special education eligibility. Only seven states—Colorado, Connecticut, Idaho, Florida, Louisiana, Rhode Island, and West Virginia—prohibit the use of the severe discrepancy model, either through laws or guidelines, allowing only RTI as the methodology for identification. Colorado began requiring the exclusive use of RTI beginning with the 2009-2010 school year. However, the method by which RTI is to be implemented is provided in the form of guidelines rather than binding stipulations, meaning schools are left to decide, for example, the total number of weeks for an intervention, the intensity or frequency of interventions, screening and progress monitoring, and the classification of students into special education (Lemmond, 2016).

RTI was designed, in part, to reduce the number of special education identifications by facilitating pre-IEP interventions (Al Otaiba, Wagner, & Miller, 2014; Fuchs & Fuchs, 2009; Fuchs & Vaughn, 2012; Kavale, 2005).¹ Some research suggests it has had such an effect (Marston, Muyskens, Lau, & Canter, 2003; McNamara, 1998; McNamara & Hollinger, 2003; Sornson, Frost, & Burns, 2004), although a recent policy analysis suggests that on at least a macro level, special identification after RTI has not decreased and in fact may be increasing in states that have mandated RTI (Lemmond, 2016).

For schools in DPS, Colorado's RTI change was not the only policy alteration that may affect the proclivity to identify students for special education. In 2009, DPS created the Task Force on Special Education in Autonomous Schools, which presented recommendations to the DPS board on how to address the special education gap (Meyer, 2009; Meyer & Hubbard, 2009). Based on those recommendations, DPS in 2010 joined more than 20 other public school districts across the country that entered into "compacts" with charters (Whitmire, 2014). Among other things, the Denver

¹ RTI was also instituted in response to criticisms of the discrepancy model that included bias (Gaviria-Soto & Castro-Morera, 2005), imprecision (O'Donnell & Miller, 2011; Reid, 2015; Reschly, 2002), a "waiting to fail" approach (Reynolds & Shaywitz, 2009), and over-identification of students into special education (Batsche, Kavale, & Kovaleski, 2006; Kavale, 2005).

compact required charters to serve a larger percentage of special education students by hosting centers specializing in autism, emotional disturbance, and cognitive delay, with a target of serving 15% of the district's students with significant needs (AP, 2012; Robles, 2010; Zubrzycki, 2015). In return, charters were granted access to DPS facilities and were provided greater resources, such as personnel, specialized training, and funding (AP, 2012; Meyer, 2010; Whitmire, 2014).

Prior to the compact, no charter school in Denver operated a center-based program (Meyer, 2009). By 2015, nine charter schools enrolled 58 students in K-12 center programs. That was out of 132 centers in district and charter schools combined, serving approximately 1,300 students (Zubrzycki, 2015). In 2016, 15 charters were to have programs for an estimated 107 students. The target for 2020 is 40 charter school centers serving 300 students (Zubrzycki, 2015).

Methods

Study Context

To examine the study's questions, we used data provided by DPS covering fall 2012 through fall 2015. During that time, DPS educated approximately 80,000 students, around 9,000 of those in charter schools (Barkmeier, 2012).

Charter schools have a long history in Denver, going back to the early years of charters in the state. Although the relationship between the district and charters was initially adversarial, DPS now encourages the formation of charters 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/>).

The method by which parents choose schools in Denver is a CES. Through the CES, parents can choose either a traditional public school (TPS) or a charter school through a single online or paper application (Gross & Denice, 2015). The process is designed to optimally match students to their preferred school in a way that is efficient, equitable, and transparent. Each spring, parents are given an opportunity to state their preference for where their child attends school in the fall. Parents can select up to five choices, including both charter schools and TPS (Klute, 2012). They fill out a common form that is returned to the central administration office.

Schools also list preference categories, for instance for siblings of current students or for students who reside within a targeted neighborhood. Students are matched to schools according to where they fall within the school's preference categories. If there are more available seats after filling all students classified within the first preference level, then the algorithm matches students in the second school preference category, and so on. When there are more students within the school preference category being matched than are available seats within the school, students within that preference category are assigned randomly. The student is assigned to attend his highest preferred school to which the process matches him.

Parents can use the system in any grade level, or they can forego the system entirely and allow their child to be assigned to a school, usually based on neighborhood. Once enrolled in a school, parents

do not have to use the system again for their child to remain in that school (i.e., reapply to the same school each year).

Among those who were initially assigned by the algorithm to attend a charter school in the two entry cohorts analyzed, 86 percent actually attended that school. That number is comparable to the 85 percent of students who enrolled in their initially assigned district school.

The special education gap in Denver.

Specific to special education enrollment in Denver, Figure 1 illustrates the proportion of district and charter school students classified as requiring special education services by grade overall and for particular classifications of interest.² Clearly, there is a small overall special education gap between school sectors when students enter kindergarten. This early gap is driven largely by the category of speech or language disability. However, the gap in speech and language declines to the point of nonexistence as early as four years later, when students are in third grade. Meanwhile, the overall special education gap grows largely because students in TPSs are more likely to be classified as having a SLD in later grades than are students in charter schools.

The figure suggests that the special education gap is largely driven by the category of SLD. However, such a descriptive analysis is not able to determine whether or the extent to which the disproportionate growth in the SLD category within the district sector is due to differences in the likelihood that a student would receive the classification in the charter sector or if it is due to differences in the type of student attending each sector.

[FIGURE 1 ABOUT HERE]

Sample, Data, and Variables

The study sample included almost 12,000 students in charter and TPS. The sample was limited only to students who entered kindergarten in fall 2012 or fall 2013, which means that the third grade is the highest grade we observe. We limited the data in this way because a preliminary descriptive analysis indicated the overwhelmingly large proportion of special education classifications occurred before middle and high school. The smattering of identifications in secondary grades would have made any analysis at those levels meaningless in its implication. In order to focus on new special education classifications, we restrict the estimation sample to include only students who did not have an IEP when they entered kindergarten. Results are qualitatively similar when the sample is expanded to include all kindergarten entrants.

The dataset includes demographic and classification information for the universe of students enrolled in Denver district and charter schools. It also includes information from the city's CES. For each student, we observe each school listed as one of the potential five preferences, with the order of the preference. We can then use a unique school identifier to determine whether a listed preferred school is a charter.

² Similar figures appear in Winters, 2015a. See that article for a more detailed breakdown of the special education gap in Denver and New York City over time.

As Table 1 indicates, around 8% of the entire sample had an IEP when they entered kindergarten. The table disaggregates descriptive statistics based on whether families chose a charter school during common enrollment and whether a student started in a charter school in kindergarten. Differences between groups are measured with simple t-tests. Student characteristics are measured as of the kindergarten entry year. As indicated, the differences in the percentages of students with IEP classifications are small based on school status, meaning there appears to be no meaningful gap in the overall percentage of students with special needs based on school type at entry.

As for other student characteristics, there are some notable differences between the two school sectors (see the final two columns of Table 1). A greater percentage of those who start in charter schools are identified as English as a Second Language, are African American, and qualify for the reduced lunch program. Conversely, greater percentages of students in TPS qualify for the free lunch program and are classified as bilingual. In other respects—such as gender and other categories of race ethnicity—the two groups are statistically equivalent.

For the first research question, the dependent variable was an indicator for whether a student was classified as special education as of fall 2015. For the second research question, we disaggregated the IEP classification into disability categories of SLD, speech and language, and autism. This enabled us to measure whether there was a difference in the likelihood of being classified into particular disability categories based on type of school.

[TABLE 1 ABOUT HERE]

Identification Strategy

The preferred method for measuring the impact of charter schools on educational outcomes is to take advantage of enrollment lotteries to implement a randomized design. Abdulkadiroglu, Angrist, Narita, and Pathak (2015), for example, present a way to use randomness within Denver’s CES to produce causal estimates of charter school effects.

Unfortunately, a randomized design is not available for the present study. As mentioned above, because new IEP classifications occur almost exclusively in early elementary grades, our sample is restricted to include only new kindergarten entrants. There were only eleven charter schools serving kindergarten during this time. Further, Denver’s CES structure leads only a small minority of students who applied to be truly randomly assigned a seat. In contrast, although they also study Denver, Abdulkadiroglu, et al.’s (2015) randomized control trial analysis of the impact of charter schooling on student test scores incorporates any student entering a charter school in grades four through ten, which substantially increases the number of available observations and thus improves statistical power. That receipt of a new IEP only occurs for some students, unlike changes in standardized test scores, only exacerbates the need for additional observations in order to detect meaningful effects.

We thus employed an observational approach. Prior within-study comparisons—all focused on achievement rather than classification rates—suggest that estimated charter school impacts using matching or well-controlled observational designs closely approximate those from randomized field trials (see for instance Angrist, Pathak, & Walters, 2013; Abdulkadiroglu, Angrist, Dynarski, Kane, & Pathak, 2011; Fortson, Verbitsky-Savitz, Kopa, & Gleason, 2012). Further, we argue that the unique

data in Denver allows us to improve considerably upon prior attempts to control for the differences between students attending charter and district schools directly.

In simple terms, our strategy is to take advantage of the information about student schooling preferences revealed by the CES in order to control for a greater number of unobserved differences between charter and district school students than possible in prior observational studies. The analysis may not be based on random assignment, but it is a significant improvement over standard observational techniques and under reasonable assumptions should produce causal estimates. As pointed out by Barnow, Goldberger, and Cain (1981), even in an observational setting, “Unbiasedness is attainable when the variables that determined the assignment rule are known, quantified, and included in the [regression] equation.” As guided by that observation, our approach is similar in spirit to that used by Dale and Krueger (2002), who studied the wage effects of attending a selective college.

The fundamental problem with comparing the observed differences in outcomes among those who attend charter and district schools is that we have reason to suspect that factors unobserved by the researcher are related both to the outcomes and the likelihood that students enroll in a charter school. In particular, the decision to apply to a charter school is likely complex and related to factors that are not present in administrative datasets.

At least some prior observational analyses of charter schools have failed to adequately account for such unobserved factors related to both applying to a charter and later outcomes because the administrative datasets they accessed observed only whether students actually enrolled in a charter or a district school. Denver, however, adopted the CES beginning in fall 2012, and as a consequence our dataset allows us to observe not only the school that the student attended, but also each school that the student listed as a preference. That is, we are able to observe the student’s decision whether or not to apply to each Denver school. Thus while there remain many variables that we do not observe that are related to both applying to a charter school and the outcome of interest, we do directly observe whether or not the student considered the charter school to be a desirable option. We argue that the Denver dataset thus allows for a unique opportunity to account for unobserved differences between charter and district students directly.

Students who apply to the same schools are likely to be similar in ways that are unobserved in the dataset. For instance, we might suspect that they are as likely to live nearby, and they clearly had the informational resources necessary to know that the charter school was available to them and perhaps a good fit for their child. By controlling for a series of dummy variables indicating each school the student listed as a preference we are able to account for a far greater proportion of unobserved differences between those attending charter and district schools than has been previously possible.

In our case, the outcome of interest is whether the student was observed to have an IEP (or a specific IEP classification) as of fall 2015. Our basic model for estimation takes the form:

$$(1) IEP_{ij} = \beta_0 + \beta_1 charter_j + \alpha_2 X_i + \delta_j + \mu_{ij}$$

where IEP indicates whether the student is observed to have an IEP as of fall 2015, and δ is a series of dummy variables indicating whether the student listed a particular charter school as one of the five available preferences. That is, we employ separate dummy variables for each charter school to

which the student could have listed a preference that equals one if the student listed that school and zero otherwise.³ The model additionally includes a dummy variable indicating whether the student first enrolled in kindergarten in fall 2012 or fall 2013 and an indicator for whether the student is observed in the second or third grade in fall 2015. To aid interpretation, we use OLS to estimate (1), resulting in a linear probability model. Results are similar when estimated via Probit.

The coefficient of particular interest is β_1 , which represents the effect of attending a charter school in kindergarten on the probability that a student is classified as having an IEP by fall 2015. All students who entered a charter school in the fall of their kindergarten year have a value of 1 for the *charter* variable, whether or not they eventually left the sector during the time period of the analysis.

The central assumption underlying estimation of (1) is that controlling for observed characteristics including the schools to which each student listed a preference accounts for unobserved differences between those who actually attend charter and district schools that are also related to the probability of IEP assignment.

Results

The results from estimating various versions of (4) are reported in Table 2. For these models, the table reports the estimated impact of enrolling in a charter school in kindergarten on the probability that a student is observed with a particular IEP classification as of fall 2015. All models are restricted to include only students who did not have an IEP classification when they entered kindergarten. Each column represents a different specification for accounting for school preferences or sample restriction. We estimate models that either control for an indicator for whether the student listed a preference for any charter school and also those that include an indicator for each charter school for which the student listed a preference. We also present models that include all students that entered kindergarten without an IEP and also those that restrict the sample to include only such students who listed at least one charter school preference. In the latter case, we do not report results for the probability of being classified as autistic because so few students in the more restricted sample received such a classification.

We first consider the results for the impact of attending a charter school on the probability of having any IEP by fall 2015. In each case, the coefficient is negative, suggesting that attending a charter school reduces the likelihood of receiving an IEP by about 1 percentage point. For context, about 4.8 percent of students who did not begin in a charter had an IEP at this time.

This result is statistically significant in the case when the sample includes all students who entered kindergarten without an IEP and the model includes an indicator for each charter school for which the student listed a preference. The coefficient is similar but the result becomes statistically

³ It would be possible to include dummy variables for each school. However, doing so significantly reduces the statistical power of the estimate. Further, that approach would effectively limit the comparison to students listing the exact same schooling preferences, which would not allow for enough variation in enrollment patterns in order to observe charter school effects.

insignificant, however, when the model is restricted to include only those who listed at least one charter school preference ($p = 0.183$ when school preference indicators are included).

[TABLE 2 ABOUT HERE]

The analysis does find evidence that entering a charter school in kindergarten significantly reduces the likelihood that a student is classified as SLD. The most restrictive analysis finds that entering a charter reduced the likelihood of having an SLD classification by fall 2015 by about 2 percentage points. For context, only about 2.4 percent of students who started in a district school and entered without an IEP in kindergarten were observed with an SLD classification that year. In contrast, we find no evidence that entering a charter school in kindergarten was related to a differential probability of classification as autistic or having a speech or language impairment.

Table 3 reports results from regressions broken out by particular subgroups. For space considerations, the table only reports results from models that include students who listed at least one charter school preference and who began without an IEP. It also incorporates an indicator for each charter school to which the student applied. We do not report results for autism because there are not enough students to support estimation with the more restricted sample.

[TABLE 3 ABOUT HERE]

Interestingly, the results suggest some differential effects by subgroup. There is a statistically significant decline in the probability of receiving an IEP of any kind when enrolled in a charter school, and specifically a classification of SLD for female students, but not for male students. However, it is worth noting that for the overall IEP analysis restricted to male students the coefficient is negative and of a meaningful magnitude, but imprecisely estimated. Further, the impact of attending a charter school on IEP classifications is apparent for students who began kindergarten eligible for either free or reduced priced lunch, while students in neither of those categories were as likely to receive an IEP in either sector. In only one of the estimates on samples limited to students by race/ethnicity do we find a statistically significant relationship between charter attendance and classification. However, in all but one group (white students receiving any IEP) the coefficient is in the expected direction and of a similar magnitude as the overall estimate reported in Table 2. This suggests that the results by race/ethnicity are particularly influenced by the substantially smaller sample size, which influences the precision of the estimates.

Discussion

The results from this paper suggest that attending a charter school in Denver, Colorado does not impact the likelihood that a student is newly classified as autistic or having a speech or language disorder, but does reduce the likelihood that a student is classified as having a SLD in early elementary grades. Moreover, SLD is the category that drives the greatest share of the enrollment gap between charter and district schools, as shown in Figure 1. The results from this paper suggest that a meaningful part of the difference in the proportion of students in Denver district and charter schools who are classified as in special education is driven by differences in classification. That is, part of the reason for the charter school special education gap in Denver is that the same student is less likely to receive an IEP—particularly in the area of SLD—if she attends a charter rather than a district school.

That our results vary by student subgroups is an interesting finding deserving of further research. In particular, our finding that attending a charter school reduces the probability of IEP classification (both overall and for SLD) for those eligible for free or reduced priced lunch but not for other students is worthy of additional consideration. It is possible that the sectors treat lower income students differently when considering classification. Or, perhaps Denver's charter schools are particularly effective for lower-income students, which could lead to a lower rate of classification for them in particular. As Farkas (2003) notes, low income children often enter elementary school with lesser school readiness and consequently demonstrate flatter learning trajectories. This is often exacerbated by lower expectations and less demanding curricula. In subsequent years, the compounding deficits lead to IEP classifications. Charter schools like those present in Denver may disrupt this chain by focusing intensively on skill development among urban, disadvantaged children, thereby avoiding the IEP classification. Indeed, as Barr, Sadovnik, and Visconti (2006) note, charter proponents have long argued that they provide a more effective and efficient alternative for low-income children, especially in urban areas. In Denver specifically, many of the district's charter schools make it their mission to serve disadvantaged children through what has been called a "no excuses" approach (Angrist, Pathak, & Walters, 2013; Thernstrom & Thernstrom, 2003).

It is worth noting that our results are, strictly speaking, specific to attending a charter school in Denver. This is an important consideration given that there is reason to suspect that Denver's is not the typical case. For instance, the adoption of the compact for serving students with disabilities suggests that Denver's relationship to the district sector might differ than in other localities. Further, though prior research suggests that attending one of Denver's charter schools leads to meaningful academic gains relative to attending a district school, charter school impacts in many other localities have not been as positive.

Nonetheless, that our findings are similar to Setren's (2015) results from Boston lends some confidence that the finding might hold generally, at least in localities with effective charter sectors. In that paper, Setren found that students randomly offered a charter school seat were (a) less likely to be classified into special education than were those who were not offered a seat and (b) more likely over time to be moved into less restrictive special education environments or to be declassified out of special education. Apart from analyzing another system, our unique contribution is to show that the impact of charter schooling on special education classification is particularly found in the category of SLD. Classifications such as autism and speech and language disorders are more objectively diagnosed (Tucker, 2014), and thus we might suspect they would not be influenced by factors other than the true presence of a disability. SLD, on the other hand, is the mildest and most subjectively diagnosed disability category and is heavily influenced by student academic performance. Thus, we would suspect if an educational intervention, such as school choice in the form of charter schooling, were to impact the likelihood of special education classification it would occur in the category of SLD.

Indeed, this finding of malleability in SLD is entirely consistent with recent findings by Muschkin, Ladd, and Dodge (2015) that participation in an early childhood initiative in North Carolina decreased the probability that a student was later classified as requiring special education services. Winters & Green, (2011) likewise found that competition from a voucher program specifically serving students with disabilities reduced the likelihood that students were classified as SLD in Florida. Such results are important because they suggest that at least some special education placements under the current system are due to factors related to schooling and learning, not biology.

Our results are also important in what they suggest about recent policy changes in which charter schools are expected to set and meet enrollment targets for students with disabilities. If it is the case that charter schools, at least in some localities, classify fewer students as SLD because they are able to educate students effectively without the special education classification, then enrollment targets seem to create incentives to unnecessarily classify students as disabled (Lake, 2014). Doing so has the potential to create greater inefficiencies in the educational process—special education comes with significant fiscal and opportunity costs (Haveman & Wolfe, 2000; Perna, 2015; Sladea et al., 2009)—and more profoundly has the potential to stigmatize a child unnecessarily (Harry & Klingner, 2014; Kauffman & Badar, 2013).

Instead of crafting policies about enrollment targets, it may be more worthwhile to ask what lessons can be learned from the charter sector that could reduce the need to classify students into special education. Unfortunately, the analysis in this paper is not in a position to determine why charter attendance reduces the likelihood of SLD classification, but other research suggests it is possible that students in Denver's charter schools perform better academically than they would otherwise, and this results in a lower probability of being classified as having a SLD.

It may also be, as suggested by Setren (2015), that charters disproportionately prefer not to classify marginal students as learning disabled. Instead, they may prefer to provide intensive tutoring to help students catch up if they fall behind their peers academically. Or rather than labeling a child with severe behavior problems as “emotionally disturbed,” charters might create a strong set of schoolwide behavior norms and support their teachers' use of highly effective classroom-management techniques (Lake, 2014).

Indeed, in recent experiments in Houston, Denver, and Chicago, Fryer (2014) implemented the five best practices of charter schools (Dobbie & Fryer, 2013)—increased time, better human capital, more student-level differentiation, frequent use of data to alter the scope and sequence of classroom instruction, and a culture of high expectations—to determine if such practices would affect student performance in underperforming TPS. Results suggest that charter school best practices can be used systematically in previously low-performing TPS to significantly increase student achievement in ways similar to the most achievement-increasing charter schools. Consequently, when considering gaps in special education enrollment between charters and TPS—gaps in the numbers of students with severe needs served notwithstanding—our findings suggest the focus may be better spent on whether TPS over-identify students with SLD (Artiles, Harry, Reschly, & Chinn, 2002; Harry & Klingner, 2014) rather than on whether charters discriminate.

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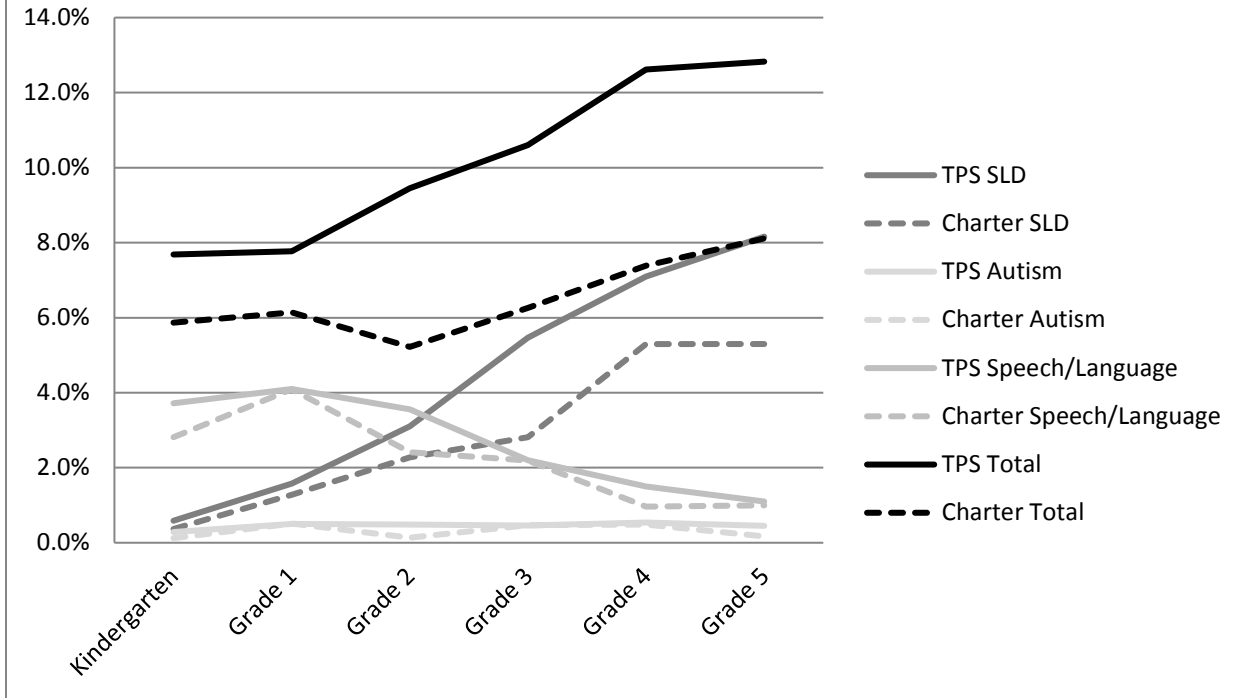
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**Figure 1:
Percent Special Education by Grade, Sector,
and Disability (Selected)**



Source: Author calculations using administrative data from the 2014 school year

Table 1: Sample Descriptive Statistics

	All	Charter Request	No Charter Request	Started Kindergarten in Charter	Did not Start Kindergarten in Charter
IEP	0.08	0.06	0.08	0.07	0.06
English as a Second Language	0.21	0.26	0.21***	0.37	0.18***
Free Lunch	0.62	0.55	0.63***	0.51	0.57*
Reduced Lunch	0.07	0.08	0.07*	0.10	0.07*
Bilingual	0.18	0.12	0.18***	0.00	0.20***
African American	0.12	0.17	0.11***	0.19	0.15*
Indian	0.00	0.00	0.00	0.00	0.01
Asian	0.03	0.03	0.03	0.03	0.02
Hispanic	0.56	0.51	0.57***	0.48	0.53
Male	0.52	0.52	0.52	0.51	0.52
<i>n</i>	11,948	1,181	10,767	486	695

Note: T-tests are used to identify statistically significant differences between those who requested a charter and those that did not, and then to compare those who started kindergarten in a charter and those that did not. The comparison of those who did and did not begin kindergarten in a charter school is limited to include only those who listed at least one charter school preference. Student characteristics that can change over time – IEP, English as a Second Language, Free Lunch, Reduced Lunch, Bilingual – are as of the student’s entry into kindergarten.

* $p = .05$, ** $p = .01$, *** $p = .001$

Table 2: Regression Estimated Impact of Beginning Charter School in Kindergarten on Special Education Classification as of Fall 2015

	Any IEP				
Coefficient	-0.0233***	-0.00836	-0.0170**	-0.0085	-0.0165
Standard error	[0.00841]	[0.00587]	[0.00843]	[0.0136]	[0.0123]
	Specific Learning Disability				
Coefficient	-0.0148***	-0.00654	-0.0130**	-0.0162*	-0.0213**
Standard error	[0.00459]	[0.00441]	[0.00591]	[0.00864]	[0.00903]
	Autism				
Coefficient	-0.00345*	-0.000765	0.00013	N/A	N/A
Standard error	[0.00198]	[0.000761]	[0.000494]		
	Speech or Language				
Coefficient	0.00401	-0.000351	-0.0027	0.0097	0.00503
Standard error	[0.00563]	[0.00349]	[0.00440]	[0.00722]	[0.00709]
Indicator for Any Charter Request	no	yes	no	N/A	N/A
School Preference Specific Indicators	no	no	yes	no	yes
Sample	All Kindergarten Entrants	All Kindergarten Entrants	All Kindergarten Entrants	Listed at Least 1 Charter School Preference	Listed at Least 1 Charter School Preference

Note: Dependent variable is an indicator for whether the student had a particular special education classification as of fall 2015. Reported coefficient represents the effect of entering kindergarten in a charter school on the measured outcome. All samples include students who entered kindergarten in fall of 2012 or 2013 who did not have an IEP at time of entry. All models additionally include controls for entering cohort, grade level in fall of 2015, gender, race/ethnicity, status at time of kindergarten entry for whether bilingual, ESL, or eligible for free or reduced priced lunch. All models estimated via OLS. Robust standard errors clustered by 2015 enrolled school listed in brackets. * $p = .05$, ** $p = .01$

Table 3: Regression Estimated Impact of Beginning Charter School in Kindergarten on Special Education Classification as of Fall 2015, by Subgroup

	Male	Female	FRL	Not FRL	White	Black	Hispanic
Any IEP	-0.00783 [0.0188]	-0.0254 [0.0174]	-0.0391** [0.0165]	0.00962 [0.0182]	0.000931 [0.0269]	-0.0175 [0.0254]	-0.0248 [0.0173]
SLD	-0.0111 [0.0126]	-0.0300** [0.0143]	-0.0269** [0.0130]	-0.0169 [0.0144]	-0.0170 [0.0158]	-0.00421 [0.0271]	-0.0206* [0.0123]
Speech or Language	0.00329 [0.0139]	0.00421 [0.00450]	-0.00601 [0.00904]	0.0214** [0.00810]	0.0230* [0.0135]	-0.0116 [0.0104]	-0.00108 [0.00946]
Observations	549	556	685	420	281	181	556

Note: Each cell represents the results of a separate regression. Rows label the dependent variable for the regression. Columns label the sample restriction. In total, table reports the results of 21 regressions – seven sample restrictions by three dependent variables. Dependent variable is an indicator for whether the student had a particular special education classification as of fall 2015. Reported coefficient represents the effect of entering kindergarten in a charter school on the measured outcome. All samples include students who entered kindergarten in fall of 2012 or 2013 who did not have an IEP at time of entry and who listed at least one charter school as a preference. All models include indicator variables for each charter school to which the student applied. All models additionally include controls for entering cohort, grade level in fall of 2015, gender, race/ethnicity, status at time of kindergarten entry for whether bilingual, ESL, or eligible for free or reduced priced lunch. All models estimated via OLS. Robust standard errors clustered by 2015 enrolled school listed in brackets. * $p = .05$, ** $p = .01$

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