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Does Attending a Charter School
Reduce the Likelihood of Continued
English Language Learner Classification?
Evidence from Denver, Colorado

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Introduction

One of the fastest growing segments of the school-aged population in the United States is English Language Learners (ELL) (Christy, Kim, & Hassel, 2014; National Center for Education Statistics, 2015; National Charter School Resource Center, 2015; Sargrad, 2016; Schroeder, 2016). ELLs are defined as children who originate mostly from a non-English speaking background and have a limited English proficiency level inadequate for academic success (Government Accountability Office, 2013; Sheng, Sheng, & Anderson, 2011; U.S. Department of Education, 2004; Wolf et al., 2008).

Although ELLs are often viewed as a homogeneous population, they are a rather highly heterogeneous and complex group of students as they represent diverse educational needs, goals, languages, cultures, and backgrounds (Payán & Nettles, 2008; Squire, 2008; Wolf et al., 2008). For example, ELLs in the United States speak more than 450 languages; a larger share of this population is native speakers of Spanish, Asian, and European languages (Payán & Nettles, 2008). In the state included in this study—Colorado—there are more than 100 language groups represented, although the vast majority of those classified as ELL speaks Spanish as a native language (Colorado Department of Education, 2011).

As this population has grown, increasing attention has been paid to whether or not ELL students have gained equal access to charter schools. Indeed, until relatively recently, English language learners were virtually absent from discussions of equity and access in charters (Buckley & Sattin-Bajaj, 2011; Miron, Urschel, Mathis, & Tornquist, 2010). Part of the reason stems from a lack of quality data (Frankenberg, Siegel-Hawley, Wang, & Orfield, 2012). One report on the ELL population in California charter schools, for example, found, “Federal data on charter schools in California, arguably the country’s most significant gateway for immigrants, describe just *seven* ELL students attending its state charter programs” (Frankenberg et al., 2012, p. 5). Related to the lack of data, few researchers have examined how and the extent to which charter schools serve ELL students (Mead & Green, 2012; Miron et al., 2010).

Consequently, a dominant assumption prevails in discussions about charters and ELL students. Similar to circumstances involving children with disabilities, when charter school populations are shown to educate smaller proportions of ELL students, it is often suggested that ELL students are prevented from enrolling in or counseled out of charter schools (Frankenberg et al., 2012; Mead & Green, 2012; Miron et al., 2010). From that, pundits call for policy interventions (Frankenberg et al., 2012), such as legislation in New York that now requires charter school authorizers to take into account a charter school’s progress toward serving a proportionate number of ELL students during reauthorization proceedings (Winters, 2014).

Yet, as Mead and Green (2012) observe, the mechanisms and reasons lying behind representation of ELL students in charter schools remains largely unknown. It is certainly possible that charters engage in enrollment practices designed to limit the number of ELL students in schools. For instance, in New York City Winters (2014) found that very small proportions of ELL students enter charter schools in kindergarten. But, as discussed in greater detail below, across-sector differences in the likelihood that a student is classified or declassified as ELL might also be a factor underlying the differences in ELL populations in the charter

schools and TPSs. To date, no research of which we are aware has attempted to measure differences in the classification of students across sectors. This paper seeks to begin to fill that void in the literature.

One possible explanation for charter schools having smaller ELL populations than surrounding traditional public schools is that charters may have more success moving students off the ELL rolls.¹ Unlike the special education designation, which students rarely lose, the expectation is that ELL students will eventually learn to speak English well enough so that they are no longer classified as learning English. Charter schools may be more successful in moving students to that point. Overall, charter schools nationwide appear to be as effective as surrounding nearby traditional public schools at increasing student achievement (Clark, Gleason, Tuttle, & Silverberg, 2015; Zimmer, Gill, Booker, Lavertu, & Witte, 2012), and other research suggests that in some areas, particularly in some urban areas—including Denver (Abdulkadiroglu, Angrist, Narita, & Pathak, 2015; Center for Research on Education Outcomes, 2009), which is the location of this present study—charters substantially outperform their traditional public school counterparts (Angrist & Walters, 2013; Chabrier, Cohodes, & Oreopoulos, 2016).

This paper adds to work evaluating whether charter schools differ from traditional public schools not only on their academic impacts, but also on rates of classification into or out of particular categories of interest. Some recent research suggests that attending a charter school decreases the likelihood that a student is placed into special education (Winters, Carpenter, & Clayton, 2016). However, whether and to what extent there are across-sector differences in the declassification of the ELL designation has not to our knowledge been seriously considered in the academic literature.

To address this issue, we utilize an administrative dataset made available by Denver Public Schools (DPS). In particular, we take advantage of Denver's centralized enrollment system, which allows us to observe student demographics, school enrollment, and also their preferences for schooling placement in order to estimate the impact of attending a charter school on the probability that a student who entered elementary school with an ELL classification was still so-classified in later elementary grades.

ELL Populations in Charters and TPS

Prior research suggests that charter schools in several jurisdictions serve disproportionately fewer ELL students compared to TPS. A 2009 issue brief on Massachusetts public schools, for example, found that 32 out of 40 charters enrolled a lower proportion of ELLs compared to their TPS counterparts (Multicultural Education, 2009). In Arizona's public schools, 2007-08 student level data showed charters had the highest percentage (35%) of schools with no ELL population, compared to alternative schools (22 %) and TPS (5%) (Haas & Huang, 2010). Chingos and West (2014) likewise found ELL students make up 6% of Arizona middle school students attending TPSs and 4% in charter schools.

¹ For an example of this view, <http://www.chalkbeat.org/posts/ny/2012/06/13/moskowitz-to-authorizers-reject-high-need-enrollment-targets/#.V7HzcE0rJD8>

In New York, Buckley and Sattin-Bajaj (2011) investigated the enrollment patterns of ELL students in charter schools and their district school counterparts over the course of three years. Results indicated that ELLs were consistently underrepresented in charter schools. Sattin-Bajaj and Suarez-Orozco (2012) likewise found 7.4% of New York's student population was classified as ELLs in district public schools, but only 2.1% were classified as ELLs in charter schools. Although the study suggested slight improvements in the percentage level of ELLs enrolled in charter schools between 2007-08 (2.8%) and 2008-09 (3.6%) school years, substantial enrollment gaps persisted. A final study of New York schools used longitudinal student-level enrollment data to show that the proportion of ELLs enrolled in charters is significantly lower than the proportion of ELLs enrolled in TPS (Winters, 2014). Winters noted that the gap is substantial at every grade, although the largest enrollment gap was at the kindergarten and first grade level.

One study of Texas schools found only 9.2% of students were classified as ELL in charter schools, as compared to the state average of 14.3% (Penning & Slate, 2011), and in California, a mixed-method study revealed that in 2012-13 the representation of ELLs in charters, based on statewide averages, was almost eight percentage points fewer than ELL representation in TPS (Taylor, 2015). This gap was one percentage point smaller than in 2008-09. In terms of urban and suburban charters schools, ELL representation was almost four percentage points fewer than their counterparts in TPS, and rural charters enrolled more than 16 percentage points fewer ELLs compared to their TPS counterparts. The study also revealed that charters with greater autonomy had control over their enrollment and were able to serve higher proportions of ELLs compared to non-autonomous charters and TPS.

Conversely, a study on the percentage of ELLs in California, Texas, and Florida school districts in the 2011-2012 school year suggested that the percentage of ELLs in charter schools was similar to the percentage of ELLs in TPS. For instance, the percentage of ELLs in charter schools in the Houston Independent School District was 28.9% compared to their traditional counterparts which had 29.8% (U.S. Department of Education Office of English Language Acquisition, 2015). Likewise, nationwide data from 2011-12 indicated that the percentage (9.8%) of K-12 ELL students in charters was greater than the percentage (9.1%) of k-12 LEP students in TPS (Bitterman, Gray, & Goldring, 2013).

As for differences between the two sectors in the classification, reclassification, and declassification (i.e., exit) of students as ELL, we know of only two studies that have considered this topic. According to Winters (2014) and Setren (2015), ELL enrollment gaps may be because charters, as compared to their TPS counterparts, are far more likely to declassify students as ELL. We define these processes below.

Classification, Reclassification, and Declassification

The implementation of federal policies concerning the identification, placement, reclassification, and exit of ELLs differs across states and districts (Kindler, 2002; National Association of Charter School Authorizers, 2016; Tanenbaum et al., 2012; Wolf et al., 2008). This is because some states determine the general procedure for ELLs while they leave their local school districts with the responsibility of determining some or all of the guidelines and performance criteria for

ELL services, thereby resulting in differences in criteria (National Research Council of the National Academies, 2011; Wolf et al., 2008). In general, to classify students as ELL states use some combination of home language survey, teacher observations or interviews, parent input, referrals, student records or grades, informal assessments, language proficiency tests—such as the Language Assessment Scales, the Woodcock-Munoz Language Survey, and the IDEA Language Proficiency Tests—standardized tests, and portfolios (Kindler, 2002).

Following the initial identification process, students identified as likely ELL receive a follow-up assessment to determine students' English proficiency level (National Research Council of the National Academies, 2011). For example, districts in the state of Colorado administer a screener placement test (Colorado English Language Assessment [CELA] or World-Class Instructional Design and Assessment [WIDA]), which assesses all four language domains (reading, writing, speaking, and listening) among students needing ELL services (National Research Council of the National Academies, 2011). This assists in determining student needs and placement in an ELL program.

After receiving ELL services, the language proficiency level of ELLs are annually reassessed through an English language proficiency test, and students who perform at a level defined as proficient may be considered for reclassification, which is the cessation of services but not monitoring (National Research Council of the National Academies, 2011; Wolf et al., 2008). According to Kindler (2002), to reclassify students into mainstream classrooms, most schools also employ student records and grades, teacher input, parent input, referrals, formal assessments, standardized tests, and other metrics (Kindler, 2002). Students who continue to demonstrate proficiency during the reclassification period exit ELL classification.

The identification, placement, reclassification, and exit of ELLs in Denver Public Schools (DPS). The process in Colorado and DPS closely parallels the one described above (Colorado Department of Education, 2011). In DPS, it is supervised by the Instructional Services Advisory (ISA) team (Denver Public Schools, 2016). The ISA is responsible for making decisions to support the needs of each ELL student in an English language Acquisition (ELA) program. To begin the identification process, the Home Language Questionnaire (HLQ) is administered by trained personnel to determine whether a student's home language is different from English and to conduct an initial assessment of ELL status (Denver Public Schools, 2016). Once the HLQ indicates that a student's home language differs from English, students are conditionally identified as ELL. Within 10 calendar days, the school must administer the WIDA (also known as W-APT) to determine a student's English proficiency level; however, a conditionally identified ELL student must be conditionally assigned to ELA classes while awaiting an evaluation of the WIDA/W-APT result as well as the Body of Evidence (BOE), which are to be reviewed within 21 calendar days before making the identification decision (Denver Public Schools, 2016). The BOE includes the multiple forms of data described above.

The reclassification (also called redesignation) of an ELL student occurs when student assessment scores and other evidence demonstrate proficiency in the four language domains (Denver Public Schools, 2016). However, reclassification differs from exiting since after reclassification, a student will be placed under constant monitoring for two years and may be reentered into English language services if the need arises. Thus, ELL students are required to

complete testing annually in order to evaluate their development toward achieving proficiency in English. After monitoring reclassified students for two years, they may be officially exited from the English language program, making them ineligible to receive services (Denver Public Schools, 2016).

Given the flexibility and reliance on student improvement in English in the classification, reclassification, and exit process, it is not surprising, and perhaps even expected, that differences between school sectors (not to mentioned schools, districts, and states) would exist. Moreover, evidence that charters appear to educate ELLs more effectively than traditional public schools (Center for Research on Education Outcomes, 2009) may also suggest another reason for smaller percentages of ELL designations in the charter sector. The question is, then, whether and to what extent such differences are systematic between sectors and the extent to which such differences may result from differences in the classification/declassification process between charters and TPS. If so, the policy implications would be far different from the assumptions that currently prevail in policy discussions and interventions. This makes our research all the more important.

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. 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 there 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).

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 focus on new kindergarten entrants primarily because students are expected to be classified as ELL early in their schooling careers—students do not tend to lose proficiency in English from one year to the next—and kindergarten is the most common entry grade.

As Table 1 indicates, around 21% of the entire sample were designated ELL when they entered kindergarten.² 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 t-tests. Student characteristics are measured as of the kindergarten entry year.

For the primary research question—whether there is a difference between charters and TPS in the status of ELL students by the end of third grade—the dependent variable was an indicator for how a kindergarten ELL student was subsequently classified as of fall 2015.

The dataset 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. This proved useful not only determining the school sector in which a student was enrolled but also in constructing a strategy to identify enrollment in a charter school as a cause of differences in the study outcome.

² In this analysis, classification as an English as a Second Language student was used as the indicator of ELL status. It is likely that at least some students classified as Bilingual may also be ELL. Thus, the total number of ELL students in DPS is likely greater than 21%.

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.

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

Identification Strategy³

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 ELL classifications occur primarily 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 common enrollment system 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, Angrist, Narita, and Pathak’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 changes in ELL status only occur 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 a more observational approach. Prior within-study comparisons suggest that estimated charter school impacts using matching or well-controlled observational designs closely approximate those from randomized field trials (see, for instance, Abdulkadiroglu, Angrist,

³ This description of our identification strategy also appears in large part in Winters, Clayton, and Carpenter (2016).

Dynarski, Kane, & Pathak, 2011; Angrist, Pathak, & Walters, 2013; 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.

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.

Suppose that a student's decision to list a preference for school j is related to both observed (X_1) and unobserved factors (X_2).

$$(1) \text{ if } Z_{ij} = \gamma_1 X_{1i} + \gamma_2 X_{2i} + v_{ij} > C_i \text{ then list school } j \text{ as preference} \\ \text{Otherwise do not list school } j \text{ as a preference}$$

Where Z is an index that characterizes the student's schooling preferences, γ_1 and γ_2 are weights the student places on observed and unobserved factors, and v represents idiosyncratic student preferences. C represents a value for the index, above which the individual will choose to list the school as a preference. It is straightforward to imagine grouping different preferred schools into charter and district categories.

Now, suppose that the equation linking attendance at a particular school to educational outcomes takes the form:

$$(2) Y_{ij} = \alpha_0 + \alpha_1 \text{school}_j + \alpha_2 X_{1i} + \alpha_3 X_{2i} + \mu_{ij}$$

where school is an indicator for the school attended, and μ is a stochastic term.

If all of the variables are observed, then estimation of (2) in OLS would produce an unbiased estimate for α_1 . However, in practice X_2 is unobserved, and thus researchers are forced to estimate an equation that omits X_2 :

$$(3) Y_{ij} = \alpha_0 + \alpha_1 \text{school}_j + \alpha_2 X_{1i} + \mu_{ij}$$

In this case, because X_2 is related to both the schooling enrollment decision and later educational outcomes, estimation of α_1 is biased. In the case of estimating the impact of attending a charter

school, if there are systematic differences in the type of students applying to charter schools as a group, then this same argument applies.

The problem facing the researcher is to find a way to account for X_2 even though it is not present in the dataset. As noted 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” (p. 47). 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.

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. In the language of (1), we do not observe X_2 directly, but we do observe if $Z_{ij} > C_{ij}$. We argue that the Denver dataset thus allows for a unique opportunity to account for unobserved differences between charter and district students directly.

In application, we account for differences in the type of student who attends a charter school in two ways. First, we present results that either control for with a covariate or select the sample to include only those students who listed at least one charter school as a preference on their CES form. These analyses focus the estimation on those students who expressed at least an openness to attending a charter. Second, we take advantage of the fact that we observe the specific charter schools to which each student listed a preference. 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 a student’s ELL status as of fall 2015. Our basic model for estimation takes the form:

$$(4) \text{ELL}_{ij} = \beta_0 + \beta_1 \text{charter}_j + \alpha_2 X_i + \delta_j + \mu_{ij}$$

where ELL indicates a student’s ELL status 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. 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.

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 still classified as ELL 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 (4) 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 later ELL classification.

Results

The results from estimating versions of (4) using slightly different specifications and samples are found in Table 2. The table separates results from models that include all kindergarten entrants in the sample from those that include only those students who were classified as ELL in kindergarten. The premise of the latter sample is that since the sample is restricted to those observed to enter the school in kindergarten, only students who were classified as ELL at that time would be expected to lose the designation, since few students should be newly classified as they move through elementary grades. The models that include all students regardless of kindergarten ELL status include a control for kindergarten ELL status.

Table 2: Regression Results

	Coeff. [se]	Coeff. [se]	Coeff. [se]	Coeff. [se]	Coeff. [se]
<i>Sample Includes all Kindergarten Entrants</i>					
Started Kindergarten in Charter	0.00297 [0.0207]	0.00791 [0.0218]	0.00845 [0.0207]	-0.0770*** [0.0254]	-0.0895*** [0.0233]
Observations	11,948	11,948	11,948	1,181	1,181
R ²	0.446	0.446	0.448	0.545	0.565
<i>Sample Includes Only those Observed to be ELL in Kindergarten</i>					
Started Kindergarten in Charter	0.0360 [0.0449]	0.0451 [0.0450]	0.0542 [0.0421]	-0.0891 [0.0652]	-0.0890* [0.0509]
Observations	2,546	2,546	2,546	306	306
R ²	0.080	0.081	0.091	0.098	0.188
Demographic, Grade, and Cohort Controls	✓	✓	✓	✓	✓
Control for Listing Preference for Charter		✓			
Dummy for Each Charter School Preference			✓		✓
Sample Includes Only Those Listed Charter Preference				✓	✓

The analyses reported in the first three columns include in the sample all students regardless of whether or not they listed a charter school as a preference. Each of these models reports a positive but statistically insignificant relationship between starting in a charter school and being classified as ELL as of 2015. In the case of models restricted to those classified as ELL beginning in kindergarten, the coefficients are of a meaningful magnitude but estimated with so little precision that they remain statistically insignificant at any conventional level.

The primary results, found in the final two columns, show that restricting the sample to include only those who listed a charter school preference has a large impact on the estimates. In each case, the coefficient turns negative and is of a meaningful magnitude, suggesting that attending a charter school in kindergarten reduced the probability of being observed as classified as ELL in 2015 by between 7.7 and 8.9 percentage points. The result is statistically significant in each case, except the model where the sample is restricted to include only those observed to be ELL in kindergarten and does not include a specific fixed-effect for each charter school listed as preference. Adding in the dummy for each charter preference has only a very small impact on the coefficient but improves the precision of the estimate.

Thus, analyses that account for the selection bias inherent in the decision to list a charter school as a preference find evidence that beginning in a charter elementary school significantly and substantially reduces the likelihood that a student is observed to be ELL as of the second or third grade. This result is found whether the model includes all students or focuses entirely on declassifications of those who entered kindergarten with an ELL designation.

Discussion

This paper finds evidence that attending a charter elementary school in Denver reduces the likelihood that a student is or remains classified as an English language learner by the third grade relative to had the student attended a school in the traditional public sector. These results contribute to a variety of issues in the charter school literature.

First, it is worth noting that our results further illustrate the importance of accounting for unobserved differences between those who apply to charter schools and those who do not when considering charter school impacts. Though this point has been long accepted within the academic community, it is notable that direct comparisons between charter and traditional public schools without accounting for this sample selection issue remain common in the popular press.⁴ That our estimates switch signs and become quite large once accounting for student identified preference to attend a charter school suggests that the average student enrolled in a charter school differs substantially from those who are not interested in attending a charter school in ways that are not accounted for with simple demographic controls.

Second, the results of this paper speak directly to the growing conversation about the type of student enrolled in urban charter schools. Our findings suggest that a portion of the difference in

⁴ See, for example, <http://fox2now.com/2014/02/08/school-choice-charter-vs-public-schools/> or http://www.bozemandailychronicle.com/news/education/education-showdown-montana-public-schools-vs-charter-schools/article_a8f96b5e-5d39-11e2-954f-0019bb2963f4.html

the proportion of ELL students in charter and traditional public schools occurs because of cross-sector differences in the likelihood that a student maintains their ELL designation as they progress through school. Some recent research suggests a similar effect of attending a charter school on the probability that a student is classified as needing special education services (Setren, 2015; Winters, 2013; Winters et al., 2016).

Third, the effects we find for ELL in this paper are particularly interesting because, compared to many special education categories, ELL declassification is a relatively objective process. Students are given a yearly exam on which they can demonstrate proficiency in English, with the expectation that at some point in their academic career they will no longer be classified as ELL. The results from this paper suggest that attending a Denver charter school speeds the process of passing through this objective hurdle, suggesting not only a classification difference but a difference in the speed of achieving fluency in English. These results are at least consistent with research finding positive academic impacts from attending a Denver charter (Abdulkadiroglu, Angrist, et al., 2015; Center for Research on Education Outcomes, 2009).

Fourth, these results speak to recent policy proposals and adoptions concerning the proportion of ELL students served by charter schools. Charter critics often suggest disproportionate ELL enrollment in charters compared to traditional public schools results from discriminatory actions by school leaders in preventing ELL students from enrolling or counseling them out of the school (Frankenberg et al., 2012; Mead & Green, 2012; Miron et al., 2010). To the extent such actions occur, no one has yet demonstrated they prevail throughout the charter sector or that smaller proportions of ELL students in charters result from such discrimination. In contrast, our results provide systematic and empirical evidence of another potential reason for disproportionality, one that suggests policies designed to ensure equivalent proportionality are likely ill-designed.

Specifically, the goal should be to move ELL students to English proficiency as quickly and effectively as possible, not to maintain students' ELL status. Thus, policies that focus exclusively on relative proportions create the wrong incentives and ignore the more important goals of time to and level of proficiency. We present evidence from only one city, of course, but if further research in other districts confirms our findings, it may be more beneficial to examine if ELLs in charters achieve at efficacious levels and if so what contributes to the success of charter schools in moving ELLs to proficiency faster and more effectively.

Indeed, such further research would be an important complement to what we present here, since our analyses provide no insight into why or how ELLs progress to proficiency faster in charter schools. An important part of such research would be determining why the charter sector on average realizes such effects, rather than just charters that specialize in educating ELLs or immigrant students. Colorado's charter schools are quite diverse, ranging from institutions that take a traditional back-to-basics approach to those that subscribe to more progressive programs (Carpenter & Kafer, 2009). Some serve general student populations, while others target specific type of learners (i.e., at risk). In Denver alone, charters include KIPP, STEM schools, those that serve only females, college prep, and Montessori, to name just a few.⁵ Yet despite this diversity,

⁵ A list of DPS charters can be found at: <http://portfolio.dpsk12.org/our-schools/charter-schools/charter-schools-of-denver-public-schools/>

DPS charters on average appear to move ELLs to proficiency more expeditiously; it would be revealing to understand why.

Importantly, these results say nothing about the academic performance of ELLs beyond classification status. Though recent research suggests benefits from being reclassified out of ELL (Carlson and Knowles 2016), it is entirely possible that charters reclassify ELLs too soon, thereby harming later academic achievement. Additional research examining the performance of current and reclassified ELLs would represent a beneficial contribution to this important discussion. Finally, it would be helpful for subsequent studies to compare the classification and reclassification process in charters and traditional public schools across different contexts and grade levels. Specific to context, as in many states, Colorado's charters operate in urban, suburban, and rural settings (Carpenter & Kafer, 2013). Our analyses examined only schools in an urban school district; further study of ELLs in suburban and rural setting would be an important contribution. As for grade levels, ELL students enter schools at all grades, and one of the more consistent findings about second language acquisition has been that younger learners consistently exhibit greater proficiency sooner than older learners (Abrahamsson & Hyltenstam, 2009; Mayo, Florentine, & Buus, 1997). Indeed, according to Conger (2009), the amount of time needed to attain ELL reclassification increases with age. Future research could examine if charters as compared to traditional public schools continue to move ELLs to proficiency sooner in older grades and if so, why and how. Such results would play an important role in shaping policies governing not only charter schools but also how traditional public schools educate a growing sector of America's public schools.

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