

Section III: Charter Schools

Chapter 12

Charter School Outcomes

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Student outcomes are among the most important indicators by which stakeholders determine whether charter schools are an effective policy strategy for public education across the United States. Policymakers in particular want to know if charter schools foster student outcomes that are different from traditional public schools, especially given the heightened attention to test-based accountability. Policymakers also want to learn if historically marginalized students (e.g., students of color and those living in poverty) perform differently in charter schools than they would in traditional public schools. In other words, there is both a concern for overall changes in student outcomes as well as the extent to which charter schools can close persistent opportunity gaps between groups.

The term “outcome” takes on numerous meanings in the education research literature. Student achievement—understood as performance on standardized tests—is the most common outcome of discussion among researchers and policymakers. Researchers typically measure achievement as either a level of performance or as an overall gain across time. Most often, they examine students in grades 3-8 due to the concentration of charters and federally mandated testing in those grades. In addition, they measure achievement as a relative gap in levels or gains between racial and socioeconomic groups. Increasingly, however, both researchers and policymakers are looking beyond student achievement to evaluate whether charter schools impact attainment outcomes, including high school graduation, college enrollment and completion, and labor market earnings.

For that reason, this chapter provides an overview of the evidence concerning charter schools' impact on student achievement and attainment. While the scope of the review covers a wide variety of prior studies, its emphasis is on the most recent research that has applied lottery-based designs and quasi-experimental analyses using longitudinal administrative data with robust controls. Included in this review is an additional focus on research that has attempted to unpack the heterogeneity observed within the charter school sector, with special attention to the different types of charter school operators.

Methodological Considerations

A number of excellent reviews focusing on charter school outcomes have been conducted over the past decade. Teasley (2009) provided one of the earliest reviews of the literature, summarizing a wave of studies that were published in the mid-2000s. Epple, Romano, and Zimmer (2015) covered multiple facets of the charter sector in their review, such as growth, location, teacher characteristics, and student outcomes. Berends' (2015) expansive review of school choice included a dedicated section on charter schools that covered both student achievement and attainment outcomes, and highlighted the substantial geographic variation in findings. Taken together, these reviews offer a robust perspective on the state of research on charter school outcomes published through 2014. More recently, Betts and Tang (2019) conducted a meta-analysis of 38 studies using lottery-based or other value-added designs, with an emphasis on student achievement in reading and math in elementary, middle, and high school.

This chapter seeks to build on the foundation set by these prior reviews and meta-analyses. In particular, it pays close attention to the strength of research design and geographic specificity of

the estimates. Some of the high-impact studies included in the prior reviews are also included here, but special emphasis is given to those published since 2015. As with prior reviews, the scope of this chapter limits “outcomes” to student achievement on standardized tests, degree attainment (e.g., high school graduation, college enrollment), and labor market earnings. The following review does not situate the findings from the literature within the political and social contexts of charter schools, and thus it is recommended to read this chapter alongside the other charter school chapters in this volume.

Estimating the Effects of Charter Schools

To date, there is no consensus on how to best estimate the impact of charter schools (Ackerman & Egalite, 2017). Since charter school attendance is not randomly assigned, there is a strong likelihood that those who select into such schools are somehow unique on both observable (e.g., race, prior performance) and unobservable (e.g., motivation, parental support) characteristics. Researchers and readers of research, therefore, must pay close attention to methodology when evaluating the literature on charter school outcomes, as the various approaches rely on different assumptions and inferential breadth.

One of the preferred methods of evaluating charter school outcomes is through lottery-based designs of oversubscribed schools. In these studies, researchers collect data from charter schools that have more applications than available seats and hold a random lottery to see who will be admitted. Researchers can then compare the achievement gains of admitted and non-admitted students and safely conclude that any differences are due to attendance in a charter school. Although this process is highly effective at eliminating threats to internal validity, there remain

limitations with respect to external validity. By definition, that is, there is likely to be something special about schools that are so desired that a random lottery must decide who is admitted (Zimmer & Engberg, 2016). Thus, researchers and policymakers should be cautious about inferring the effects of oversubscribed schools to the population of charter schools more generally.

Policymakers often need to learn about charter school outcomes even when lottery designs are not available. This is especially true when evaluating district or statewide charter sectors, in which the vast majority of charter schools are not oversubscribed. In these cases, researchers can make use of administrative data sets that include longitudinal records of students' academic performance and a limited selection of their background characteristics (e.g., race, gender, free and reduced-price lunch status). A variety of quasi-experimental techniques can then be used to estimate the impacts of attending a charter school on student outcomes, such as matching, student fixed effects, and instrumental variable designs (Angrist & Pischke, 2009; Murnane & Willett, 2011).

Although non-experimental approaches can never eliminate the potential bias that arises from self-selection, evidence from within-study comparisons has suggested that some quasi-experimental designs can closely approximate experimental estimates when certain conditions are met. Bifulco (2012) found that including a pre-treatment measure of the outcome (i.e., student test score) and matching students from the same geographic context (i.e., school) eliminated substantial bias relative to experimental estimates on the same observations (see also Fortson, Gleason, Kopa, & Verbitsky-Savitz, 2014). The use of exact cell matching with cell

fixed effects approaches to estimate charter school outcomes has subsequently gained momentum (see, e.g., Angrist, Pathak & Walters, 2013; Dobbie & Fryer, 2013, 2016).

The Impact of Charter Schools on Student Outcomes

National or Multi-State Studies of Achievement in Charter Schools

Previous reviews of the literature have made it clear that, as a sector, charter schools have heterogeneous impacts on student test scores (Teasley, 2009; Berends, 2015; Epple et al., 2015). This is immediately evident when examining the few studies that have sought to estimate national or multi-state impacts of charter schools on student achievement. The Center for Research on Education Outcomes (CREDO, 2009, 2013) conducted two studies using longitudinal data from 16 states, including an additional 11 states (27 total) that participated in the 2013 study. Both studies relied on a virtual records control (VRC) strategy. This strategy matches students in charter schools to a “virtual twin” in a traditional public school based on observable characteristics such as demographics, participation in specialized programs (e.g., free and reduced-price lunch, English language learner), and a baseline test score. The advantage of this approach is that it includes students attending a wide range of charter schools, but it also makes the strong assumption that the observable characteristics of students adequately control for the qualities that cannot be observed (e.g., motivation, parental engagement). The latter assumption has been the subject of much debate (Davis & Raymond, 2012; Maul & McClelland, 2013).

In the 2009 study, CREDO found that the overall charter effects in reading reduced academic achievement by -0.34 percentile points and by -1.02 points in math. However, these results

varied extensively across states. Charter schools in five of the 16 participating states exhibited more positive achievement gains than traditional public schools, whereas charters in six states performed lower than their traditional public peers. The charters in the remaining five states performed identically to traditional public schools. In 2013, CREDO published an update to the study using charter schools from the same states. Since some charter schools had closed and others had opened during that time, the researchers combined the continuing charter schools and the new charter schools for the 2013 comparison. They found that the overall charter effects had increased in reading and math. In particular, charter schools improved academic achievement in reading by 0.34 percentile points. The results for math were still negative (-0.34 points), but less so than in the 2009 study. Once again, the results varied widely across states.

In another multi-state analysis of student achievement in charter schools, Zimmer and colleagues (2009, 2012) used a student fixed-effects model to estimate the impact of charter schools on student achievement across seven cities and states. Rather than drawing from all students in charter schools (see CREDO studies above), researchers using student fixed-effects models draw upon longitudinal data to compare changes in achievement growth among the subset of students who switch between traditional public and charter schools. This approach has been widely used in the literature because it allows researchers to control for any unobservable time-invariant characteristics. It has been criticized, however, due to the strong assumption that pre-treatment (i.e., prior to switching) achievement growth is a good predictor of future achievement growth. It may be the case that a sudden event (e.g., family disruption, suspension) initiated the decision to switch, which could change a student's achievement trajectory (Hoxby & Murarka, 2008).

To address this concern, among others, Zimmer et al. conducted a number of sensitivity analyses, and their findings were consistent with those from the CREDO studies. That is, students switching into charter schools from traditional public schools generally experienced null or negative impacts to their academic achievement gains in reading and math. Some positive results in math were observed in Milwaukee and Denver, although the researchers urged caution interpreting the results for Denver due to limited test data and variable results across time. The results for reading were null or negative across all sites.

Scholars at Mathematica Policy Research conducted a third study that sought to estimate the impacts of charter schools on student achievement across numerous states (Gleason, Clark, Tuttle, Dwyer, & Silverberg, 2010; Clark, Gleason, Tuttle, & Silverberg, 2015). Specifically, they utilized a lottery design from a sample of 36 charter middle schools across 15 states. To qualify for the study, the charter middle schools had to 1) have been in operation for at least two years and 2) have been over-subscribed and held an admissions lottery. Thus, the Mathematica study is the most robust among national studies in terms of internal validity, but it draws upon a select sample of over-subscribed middle schools that limits the external validity of the estimations. Despite the methodological differences, the findings were generally the same as the other two studies mentioned above. Notably, the researchers found that, on average, the over-subscribed charter middle schools produced statistically identical results to the traditional public schools attended by the lottery losers. These null effects were not the result of all schools performing the same as their traditional public counterparts, but rather some performing better and others worse. In reading, the magnitude ranged from -14.62 to 11.22 percentile points. The range in math was even larger, from -26.52 to 22.10 points.

Taken together, these national-level and multi-state studies suggest that the charter school sector generally performs about the same as traditional public schools at impacting student achievement on standardized tests. Yet, some of the evidence suggests that charter schools are more effective with certain subgroups than others. For instance, CREDO (2013) researchers found that students living in poverty—especially Black and Latinx students—tended to experience small to moderately positive gains in reading and math, whereas the gains for White students and those not living in poverty tended to be negative. The Mathematica study (Gleason et al., 2010) reported similar findings. In particular, the participating charter middle schools that served more (i.e., above the median) low-income students tended to have significant positive impacts (6.12 percentile points) in math, whereas those schools serving fewer economically disadvantaged students tended to perform much more negatively (-8.16 points). The findings for reading achievement were not as dramatic, but schools serving more low income students still performed better than those that served less (0.00 v. -3.74 points, respectively).

State-Level Achievement Impacts

Many of the early attempts to evaluate statewide charter impacts used student fixed-effects models and found little evidence that charter schools improved student achievement. In fact, they observed negative outcomes in reading and math in Texas (Booker, Gilpatric, Gronberg, & Jansen, 2007; Hanushek, Kain, Rivkin, & Branch, 2007), North Carolina (Bifulco & Ladd, 2006), and Florida (Sass, 2006), and null outcomes in California (Zimmer et al., 2003). However, Solmon and Goldschmidt (2004) found mixed outcomes in Arizona, where they observed positive impacts in reading among elementary students and negative impacts among

secondary students. Similarly, Ballou and colleagues (2008) found positive impacts in math among students switching to charters in Idaho, although the findings were sensitive to model assumptions. Finally, Ni and Rorrer (2012) examined charter impacts in Utah and found that, between 2004 and 2009, charters in that state performed slightly worse than traditional public schools. Consistent with past findings, the researchers found that the negative effects were largely driven by newly established charter schools.

While the initial wave of evidence from statewide analyses showed mostly null and negative outcomes, a more recent wave of evidence from some of the same states has suggested both pockets of improvement and ongoing struggles in the charter sector. In Texas, for example, Baude et al. (2014) examined the evolution of charter school impacts on student achievement over a 10 year period between 2001 and 2011. The findings from this longitudinal study suggest that student achievement in charter schools is improving over time as low-performing charters close, high-performing charters open, and existing charters steadily increase the value added of student achievement (cf. CREDO, 2017d). Dobbie and Fryer's (2016) analysis of Texas charters helps deepen the understanding of these trends. Using a matched cell fixed effect approach, they found that on average charters in Texas did not increase student test scores. However, students attending so-called "no excuses" charters experienced an average increase of 3.40 percentile points per year of attendance. The impact of these charters is even greater among Black and Latinx students (5.78 points). In contrast, regular charters (i.e., those that do not employ a no excuses model) decreased student achievement by 1.70 points per year of attendance, on average. No excuses schools are addressed in more detail later in this chapter.

Similar to Texas, the impacts of charter schools in North Carolina appear to be evolving over time. Ladd, Clotfelter, and Holbein (2017) examined this evolution in North Carolina's charter sector between 1999 and 2011. Much like Baude et al. (2014), Ladd et al. hypothesize that charter schools are improving due to market processes that they initiate within the broader education sector. Using a school-level fixed-effects model, the researchers found that charter schools have been catching up to traditional public schools in average achievement gains. For instance, over the 13-year period of their analysis, the average charter school gain in math increased by 3.74 percentile points and by 2.72 points in reading. The researchers note that, by 2012, charter schools were experiencing greater average achievement gains than traditional public schools in both subjects.

Researchers also found heterogeneous changes over time in Arizona, although the findings were generally less optimistic than in North Carolina. In the most expansive analysis of the state with the largest share of students attending charter schools, Chingos and West (2015) examined data from 2005 to 2012 to estimate the impacts of the charter sector on student achievement over time. Across all grade levels—elementary, middle, and high school—charter schools appeared to have a null or negative impact on student achievement outcomes. The impacts were generally small. For example, on average, charter middle school students experienced a -0.68 percentile point ($p=0.103$) reduction in math achievement for each year of attendance during the time period under analysis. There was no difference between charter and traditional public students in reading or writing.

The theme of heterogeneous outcomes continues in the state of Massachusetts. There, Angrist and colleagues (2011) used both lottery-based and matching strategies to estimate statewide charter school impacts. On average, middle school lottery winners outperformed lottery losers by 8.16 percentile points in math, but no effect was observed in English language arts (ELA). At the high school level, lottery winners outscored lottery losers by 4.42 points in ELA and 6.12 points in math. However, the estimates varied widely by geographic location. Urban charter middle schools in Massachusetts, for instance, produced average achievement gains of 4.08 points in ELA and 12.24 points in math, while nonurban charter middle schools produced achievement losses of -6.46 points in ELA and -4.42 points in math. The researchers found that urban charter middle schools were especially effective at bolstering student achievement among students of color and those qualifying for free and reduced-price lunch.

Using their VRC method, CREDO's (2017b) analysis of charters in New York state suggests that charters there have been having positive impacts on student achievement, and that these impacts have been consistent since 2013. For instance, the estimates from 2013 were 0.68 percentile points in reading (not significant) and 4.08 points in math, and in 2017 the estimate for reading became significant (2.04 points) and those in math remained nearly the same (3.74 points). The impacts were positive at the elementary, middle, and high school levels, although the findings for high schools were not statistically significant. When looking at subgroups, CREDO researchers found that the positive gains were experienced by Black students, Latinx students, and students living in poverty.

City and District Level Achievement Impacts

Studies using student fixed-effects models have illustrated mixed outcomes at the district and city levels. Zimmer and Buddin (2006) found no effect in reading or math among elementary charters in Los Angeles, and small negative outcomes among elementary charters in San Diego. The results at the secondary level in both cities were generally small and mixed. A more recent analysis of charters in Los Angeles using propensity score matching suggested that students attending charter middle schools experienced moderate positive impacts, while those attending charter high schools saw small positive impacts in reading only (Shin, Fuller, & Dauter, 2017). The positive outcomes were most consistent among Latinx students. Zimmer et al.'s (2009, 2012) multi-state fixed-effects design discussed above also included results for selected cities and the results were again mixed. The study observed null effects in reading and math in Philadelphia and San Diego, while in Chicago's charters it showed a small negative effect in reading and null effects in math. In Denver and Milwaukee, it observed that charters had a moderate and small impact on math achievement, but no impact on reading (see also Witte, Weimer, Shober, & Schlomer, 2007 for results on Milwaukee). Finally, Imberman's (2011) fixed-effects study of an anonymous district found no impact on ELA or math achievement.

Researchers have also used fixed-effects models to examine student achievement in Indianapolis' charter schools. Using data from 2002 through 2006, Nicotera, Mandiburo, and Berends (2010) found that students who switched into Indianapolis' charter schools and stayed for longer than one year experienced strong positive gains in math and null effects in reading. A study using a fixed-effects model on more recent data from Indianapolis (2008-2013) found no overall effect among students who switched into charters (Berends & Waddington, 2018),

although positive effects in math and reading were observed among the subset of charters authorized by the Indianapolis mayor's office (Berends & Waddington, 2019). In addition, Black students across all charters in Indianapolis experienced positive gains on the magnitude of 3.74 percentile points in ELA and 2.72 points in math, while Latinx students had achievement losses of -4.42 points in math ($p < .10$). Finally, White students experienced substantial losses after switching into charter schools on the magnitude of -6.80 points in math and -5.10 points in ELA.

While studies using fixed-effects and matching approaches have shown mixed results, lottery-based studies of over-subscribed charters at the local level, on the other hand, have been almost uniformly positive. Some of the highest magnitude outcomes have been observed in Boston. For example, Abdulkadiroğlu et al. (2011) found large, positive impacts for lottery winners in a sample of over-subscribed charter middle schools in Boston (see also Abdulkadiroğlu et al., 2016). In particular, lottery winners performed 8.50 percentile points higher than lottery losers in ELA, and 13.60 points higher in math. These large and positive impacts in Boston have also been observed at the high school level when examining ACT scores and AP Calculus exams (Angrist et al., 2016).

Lottery-based designs of charter schools in New York City have also shown positive results. Hoxby and Murarka (2009; see also Hoxby, Murarka, & Kang, 2009) examined over-subscribed charter schools and found moderate to small positive effects in math (3.06 percentile points) and reading (1.36 points). These findings are nearly identical to those in a recent non-experimental estimate of NYC's charter schools, which also found positive impacts for Black and Latinx students (CREDO, 2017c). In another study looking exclusively at the charters of the Harlem

Children Zone (HCZ), Dobbie and Fryer (2011) found large, positive effects at both the elementary and middle school levels. For example, lottery winners at HCZ's Promise Academy Middle School scored 9.52 points higher than lottery losers in math and 1.70 points in ELA. The effects at the HCZ's Promise Academy elementary school were also positive in both math (5.44 points) and ELA (3.40 points).

Attainment Impacts

Estimating the impacts of charter schools on outcomes such as high school graduation or college enrollment presents additional methodological complications. Booker and colleagues (2011) used a variety of strategies to overcome these challenges. They looked only at students who attended a charter middle school (i.e., to control for unmeasured selection processes), and exploited variation in proximity to charters and other high schools as instruments for the decision to attend a charter high school. Using this approach, the researchers found positive impacts of attending a charter high school in Florida and Chicago. In particular, conditional on attending a charter middle school, students who subsequently enrolled in a charter high school had a 7 to 15 percentage point advantage in high school graduation over those who attended a traditional public high school. The advantage for college attendance was similar in magnitude, at a range of 8 to 10 percentage points.

Using updated and expanded data from Florida, Sass and colleagues (2016) replicated the findings above and found that students who transitioned into charter high schools (again, conditional on attending a charter middle school) experienced a 6 percentage point advantage in high school completion and a 9 percentage point increase in the probability of college enrollment

relative to those who entered a traditional public high school. This study included two important contributions, however. First, it found that students enrolling in charter high schools experienced a 12 percentage point advantage in college persistence (i.e., attending college at least one semester in consecutive years upon entry). Second, and the paper's most novel contribution, it found significant, positive impacts of charter high school attendance on annual earnings up to 12 years following middle school (up to ~25 years of age). The findings suggest an overall earnings advantage among charter high school students of \$2,300, on average. The earnings advantage was observed among students who did and did not attend college.

Dobbie and Fryer (2016) estimated the long-term impacts of charter attendance in Texas on degree attainment and labor market earnings and found less positive results. On average, that is, charter attendance only increased high school graduation by 1.2 percentage points, two-year college enrollment by 1.5 percentage points, and four-year enrollment by 0.3 percentage points—none of which was statistically significant. The differences for average impacts on earnings and employment rates were also not significantly different from zero. However, as with the achievement outcomes detailed above, Dobbie and Fryer found substantial heterogeneity in the results for degree attainment and earnings. Interestingly, schools in their sample that had positive impacts on two- and four-year college enrollment did not have any significant impact on subsequent earnings.

While few studies have been able to link charter school impacts to long-term earnings, a number of papers and reports have estimated high school graduation and college enrollment and persistence. For example, in a study focusing exclusively on schools run by charter management

organizations (CMOs), Furgeson et al. (2012) used a propensity score matching approach to estimate impacts on high school graduation and college attendance among students attending six and four CMOs, respectively. The results suggested a positive impact of 7 percentage points on high school graduation and 13 percentage points on college enrollment, but these differences were not statistically significant. Indeed, the range of possible outcomes varied widely from a positive impact of 23 percent to a negative impact of -22 percent.

In Boston, the positive student achievement impacts also appear to translate to at least some attainment outcomes. Angrist et al. (2016) found that charter school attendance increased the pass rate on the Massachusetts high school graduation exam, as well as the qualification rate for a state sponsored college scholarship. Oddly, however, their study also found that enrollment in charter high schools reduced on-time (i.e., four year) high school graduation by 12.5 percentage points, which fell to zero once extending the time period to five years. Angrist and colleagues also found that attending charter high schools caused a shift in the type of college enrollment, away from two-year and toward four-year institutions. Charter high school attendees were also 13 percentage points more likely to attempt at least three semesters of college enrollment, an indication that charter high schools may bolster college persistence (the latter finding was only marginally significant). Perhaps the most notable finding, though, is that charter high school attendance increased the probability of four-year college enrollment among students qualifying for free and reduced-price lunch by 22 percentage points.

Researchers have also begun to explore the extent to which charter schools impact outcomes such as participation in risky behaviors (e.g., drug use) and a variety of health indicators. Dobbie

and Fryer (2015), for instance, used a lottery-based design to measure differences between lottery winners and losers to New York City's Promise Academy in the Harlem Children's Zone. In addition to being 14.1 percentage points more likely to be enrolled in college, lottery winners were also 21.3 percentage points more likely to be enrolled in a four-year college, in particular. Female lottery winners were 12.1 percentage points less likely to be pregnant during their teenage years, and male winners were 4.3 percentage points less likely to be incarcerated. However, there was no impact on self-reported drug and alcohol use, criminal activity, or any health indicators such as asthma, obesity, or mental health. Similar findings with respect to drug and alcohol use were observed in another study of high performing charters in Los Angeles (Wong et al., 2014). Yet, this study also reported marked reductions in behaviors termed "very risky," such as binge drinking, gang membership, or drug use at school.

Within-Sector Heterogeneity

A recurring theme throughout this review has been that charter schools produce heterogeneous outcomes much like their traditional public school counterparts. Some researchers have sought to unpack the mixed results within the charter sector by identifying the qualities that appear to bolster and constrain student outcomes (Angrist, Pathak, & Walters, 2013; Berends, 2015; Gleason, 2017). For example, Buddin and Zimmer (2005) compared conversion charters to startups as well as those that emphasized classroom-based versus nonclassroom-based instruction. On average, startup charters that emphasized classroom-based instruction had the most positive impacts on student achievement, while conversion charters had no effect and nonclassroom-based charters performed quite poorly. Others have begun to explore the mechanisms that shape the authorization of charters (Bross & Harris, 2016) and whether or not

differences in authorizing organizations can impact student outcomes. Overall, researchers have found more variation within than between types of authorizers, especially among nonprofit authorizers (Carlson, Lavery, & Witte, 2012; Zimmer, Gill, Attridge, & Obenauf, 2014).

Another emerging area of research focuses on the variation between types of operators. In a recent study, CREDO (2017a) researchers compared types of operators across 24 states, New York City, and Washington D.C. In particular, they compared non-networked charters, those run by a management organization, vendor operated schools (i.e., charters granted to a third party that hires a vendor to provide various levels of service), and hybrids that consist of management organizations that hire a vendor. Students attending the hybrids saw the most positive gains in math (3.06 percentile points) and reading (2.72 points) relative to those run by management organizations (1.02 points in math and reading), vendor operated schools (-0.34 points in math [not sig.], 0.68 points in reading), and non-networked schools (0.00 points in math, 0.34 points in reading). When examining the profit status of charters, non-profit charters produced achievement gains of 0.68 points in math and reading, while students attending for-profit charters experienced losses of -0.68 points in math and null effects in reading relative to their virtual twins in traditional public schools.

No Excuses Charters

As evidence has emerged that CMOs produce heterogeneous student outcomes, researchers have also sought to explore different types of non-profit charter networks. This is especially true of the so-called “no excuses” charters referenced earlier, which place an exacting focus on standardized tests, set strict behavioral standards, and often incorporate longer school days and years

(Thernstrom & Thernstrom, 2003). Since many of the charter schools using the no excuses model are over-subscribed, researchers have been able to use lottery-based designs to assess their impact on student outcomes. A recent meta-analysis of such studies found average increases in math and ELA achievement of 8.50 percentile points and 5.78 points, respectively (Cheng, Hitt, Kisida, & Mills, 2017).

The Knowledge is Power Program (KIPP) is a nation-wide network of no excuses charters that has gained substantial popularity since it began in 1994. In a study of 43 KIPP middle schools using both lottery and quasi-experimental designs, Tuttle et al. (2013) found large, positive gains for students in math and reading that grew over time. The researchers estimated that the gains in math after three years were large enough to account for 40 percent of the local gap in Black-White test scores. As the KIPP network has grown, it appears to have been able to sustain these positive impacts on student test scores across the elementary, middle, and high school levels (Tuttle et al., 2015b, 2015a) and in specific locations, ranging from urban centers in Boston (Angrist, Dynarski, Kane, & Pathak, 2010; Angrist, Dynarski, Kane, Pathak, & Walters, 2012) and the Bay Area (Woodworth, David, Guha, Wang, & Lopez-Torkos, 2008), to rural towns in Arkansas (Rose, Maranto, & Ritter, 2017). Finally, Betts' and Tang's (2019) recent meta-analysis included an estimate for KIPP middle schools and they found positive effects in math (12.72 percentile points) and ELA (5.92 points).

Researchers have also examined the impacts of no excuses charters on attainment outcomes such as college enrollment and persistence. As noted above, Dobbie and Fryer (2016) found that no excuses charter schools increased students' test scores in Texas. In addition, they found that

these schools increased the likelihood of high school graduation by 2.5 percentage points, and two- and four-year college enrollment by 1.2 and 2.8 percentage points, respectively. However, Dobbie and Fryer found no evidence that these gains were associated with significant gains in earnings. Similarly, Davis & Heller (2017) found positive impacts of attending the Noble Street Charter High School in Chicago. More specifically, they found that lottery winners were 10 percentage points more likely than lottery losers to enroll in college, and 9.5 percentage points more likely to remain enrolled in college for a minimum of 4 semesters.

Virtual Charters

Virtually operated charter schools (or “e-schools”) comprise another component of the charter sector that has begun to receive more research attention. Enrollment in virtual charter schools has grown substantially in recent years; for-profit management organizations (or educational management organizations) operate most of them and enroll far more students than do non-profit virtual charters (Miron, Shank & Davidson, 2018). Relatively few studies have attempted to estimate the impacts of virtual charters on student outcomes. Since these schools do not face the same space constraints as brick and mortar charters, there are minimal opportunities to exploit lottery-based designs of oversubscribed schools. In addition, it is possible that selection into virtual charters is unique relative to other charter schools, which would potentially increase the bias of any estimate of the impacts.

While the research is still emerging, the general picture thus far has been that virtual charter schools have strong, negative impacts on student achievement. For example, CREDO (2015) researchers found that students in virtual charters across 18 states experienced average annual

achievement losses of -8.50 percentile points in math and -3.40 points in reading. Two studies of virtual charters in Ohio corroborate these results. In the first estimate of virtual charter impacts, Zimmer et al. (2009) found average achievement losses of -14.96 points in mathematics and -8.50 points in reading. In a more recent study, Ahn & McEachin (2017) also found negative impacts even when disaggregating the results by achievement levels. In elementary and middle school math, for instance, the losses ranged from -13.94 points for low achievers to -10.20 points for high achievers (first and third tertile, respectively). In reading, respectively, the effects ranged from -8.84 to -3.40 points. Ahn and McEachin also found that students in Ohio's virtual charter schools were less likely than traditional public students and those in other charter schools to pass Ohio's graduation exams.

Discussion and Conclusion

Despite extensive heterogeneity concerning the effectiveness of the charter school sector, a few general conclusions can be drawn from this review to inform the debate about charter reform. First, the variation across states is too vast to offer specific policy recommendations at a national scale. As described above, charters in some cities appear to be doing very well at raising test scores and some attainment outcomes (e.g., Boston, New York, Denver), while in other locations the findings are mixed or negative (e.g., Indianapolis, Chicago). Furthermore, studies suggest that charter effects improve over time in some states (e.g., North Carolina, see Ladd, Clotfelter, and Holbein, 2017), while remaining consistently negative in others (e.g., Arizona, see Chingos & West, 2015). Thus, studies that are able to identify the conditions that create successful and unsuccessful charter schools will likely need to dig into specific features of state and local policy (and politics) as well as school-level practices (e.g., curriculum, instruction, length of school day

and year). Although the existing state and local analyses have helped paint a complex picture of charter schools, there remain numerous locales where we still know very little about the performance of charters. This is especially true in areas that fall outside of major cities in the United States, as some evidence suggests that non-urban charters are much less effective than their urban counterparts (Angrist et al., 2011).

Second, on average, students of color and low income students appear to experience the greatest achievement gains within the charter sector, especially in no excuses schools. This shouldn't come as a surprise, given that charter schools tend to locate in areas with high concentrations of such students, where public schools have experienced ongoing disinvestment (Epple et al., 2015). One of the stated objectives of charter school reform is to reduce opportunity gaps between traditionally marginalized students and their more privileged counterparts. In this sense, the success or failure of charter school reform should be judged, at least in part, against the extent to which charters are able to close these gaps. In addition to subgroup analyses, future research should attempt to evaluate whether or not charter schools are having a systemic impact on differences between groups in areas where they serve a relatively large share of the student population.

Next, emerging evidence seeking to unpack heterogeneity within the charter sector suggests that policymakers and authorizing bodies should pay close attention to the governance structures through which charters operate (CMOs, EMOs, independents, etc.). This includes the profit status of management organizations as well as the network context of schools. In particular, non-profit management organizations (i.e., CMOs) appear to be more effective at producing positive

student outcomes relative to for-profit charter networks and those that operate independently (CREDO, 2017a). Yet, it is unclear if the apparent benefits to charters operating in a non-profit network are conditional on size, geographic scope, or types of students served. Some of the initial studies focusing on KIPP suggest that positive test scores can be maintained even as the network grows (Tuttle et al., 2015a, 2015b). However, more research is needed to directly inform policymakers and authorizers about the effectiveness of these governance structures.

The emerging evidence concerning virtual charter schools makes it clear that these schools produce large, negative outcomes—at least in those states where rigorous work has been conducted (e.g., Zimmer et al., 2009; Ahn & McEachin, 2017). Policymakers and authorizers should be cautious about expanding this aspect of the charter sector until researchers can learn more about the quality of these schools. In the meantime, it is important that researchers implement analytical strategies that can account for possible uniqueness to the selection processes that drive students to enroll in these schools. It is plausible that virtual charters offer students a “last chance” option, in which case decreased test scores may not be the worst-case scenario. Descriptive data from surveys and interviews with parents could go a long way to learning more about these schools and the role they can and should play in the public education system.

Finally, researchers should continue the effort to examine alternative outcomes to test scores. Recent studies that have sought to estimate the impacts on degree completion, earnings, and other attainment measures suggest that, in some instances, test scores may mask other contributions that charters add to student outcomes. Thus far, there is little evidence about

changes in educational aspirations or other dispositions favorable to long-term attainment. More in-depth, mixed-methods studies could help evaluate the role of social networks, counseling, parental engagement, and the cultivation of college-going expectations in these schools. Such studies are important not only to identify qualities of charter schools that improve student outcomes, but to also feed this information to traditional public schools where the vast majority of students continue to be educated.

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End Notes

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