What Happens When Regular Public Schools Convert to Charter Schools?

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This paper analyzes achievement in 49 California elementary schools that converted from regular public schools to charter schools between 1992 and 2000. It poses two questions. First, how do conversion schools look today, in terms of enrollment, faculty, and achievement, compared to before they converted? Second, how do the conversion schools currently compare to start-up charters on these same characteristics?

Almost 15 years after Minnesota passed the first charter school law, the debate surrounding charter school achievement is as contentious as ever. The research on charter schools reveals mixed results when charters are compared to regular public schools. Opponents highlight studies that show that charter schools typically do not score as well as traditional public schools on standardized tests, while charter school proponents assert that the more important question is whether charter schools are producing larger year to year gains, especially with difficult-to-educate students. Often overlooked in the charter school research and the debate surrounding it is the fact that there are two distinct types of charter schools: those that were started as charter schools and are entirely new entities (herein referred to as "start-ups") and those that were originally regular public schools which converted to charter status ("conversions").

In addition to having the largest number of charter schools in the country, California also has the largest number of conversion charter schools of any state. The latest data from the California Department of Education charter school database reveals 135 schools that have converted since the charter school law passed in 1992, with 93 still currently operating.[1] Under California's charter school law, regular public schools that are interested in converting to charter status must gain the approval of at least half of their

current faculty (California Education Code: Section 47605-47608). If approved by the school board, conversion schools typically remain in the same facility, maintain most of their faculty, and continue to enroll most of their existing students. Also, under California law, conversion schools must give priority to students within their old geographic enrollment boundary who wish to enroll (Maloney and Kemerer 2004).

How do conversion schools compare to start-up schools, and what difference does conversion status make? Little research has examined conversion schools vis a vis start-up schools. Two studies have examined California conversion charters and found that conversion charter schools look very different from start-ups in terms of demographics and faculty characteristics and that, at least at the elementary level, conversion charter schools outperform start-ups (Loveless 2003; Zimmer et al., 2003). No study to date has examined conversion schools' performance before and after conversion.

The question of how public schools perform after conversion to charter status is important for two reasons. First, under No Child Left Behind (NCLB), schools that fail to make Adequate Yearly Progress for five straight years must undergo "restructuring," which can equate to state takeover, bringing in outside management firms to operate schools, an overhaul of existing staff, or conversion to charter status. Early evidence from states whose schools are entering into the restructuring phase reveals that conversion to charter status may not be the most popular option (Center on Education Policy 2004).[2] However, there is evidence that a few of California's failing schools are opting for the conversion alternative; four of San Diego's eight restructuring schools have opted to convert to charters. Whether or not conversion will be the preferred restructuring method, with 250 California schools and 1,150 schools across the nation

entering the restructuring stage this year, evaluating how conversion schools fare after converting to charter schools has important implications for an increasing number of schools as the law matures (Kolber 2005).

More broadly, an analysis of conversion charter schools could help answer fundamental questions about what factors may make charter schools more or less effective than traditional public schools. If indeed a charter school effect exists, an analysis of this type could help to identify causal mechanisms. If different types of charters produce different outcomes, the characteristics on which they differ may have something to do with it.

How do conversion and start-up charter schools differ? In general, conversion charter schools look more like traditional public schools than do start-up charters. Conversions typically retain the majority of their existing faculty and administration, while start-ups are less conventional with regard to faculty characteristics. While start-ups exhibit autonomy on matters of curriculum and staffing, conversion schools often follow the policies of the district in which they reside. Because of California law, conversions draw most of their enrollment from their traditional geographic boundaries, while start-up schools may attract students from across the district. Finally, conversion schools are not plagued by the demands of launching a new school, particularly finding a facility, hiring staff, and recruiting students, that absorb the time and energy of entrepreneurs starting a school from scratch.

Review of Literature

The research on charter school achievement, particularly how charter schools compare to traditional public schools, has yielded mixed results. Little research has examined charter school achievement on a national level (Nelson, Rosenberg, & Van Meter 2004; NCES 2004; Hoxby 2004), though there have been a number of multi-state analyses that examined a considerable slice of the charter school population (Greene, Forster, & Winters 2003; Loveless 2002, 2003; Finnigan et al. 2004). Most of the existent research has focused on charter schools in particular states, including New York, California, Michigan, Arizona, and Texas.

Scholars generally agree that charter schools underperform traditional public schools when achievement is examined at one point in time. The high profile study by the American Federation of Teachers (Nelson, Rosenberg, & Van Meter 2004) found that, on average, charter school students scored lower than traditional public school students on the 2003 National Assessment of Educational Progress (NAEP). The National Center for Education Statistics (NCES) report on charter school performance on NAEP largely confirmed the AFT's findings (NCES 2004). Both studies found that black and Latino students in charter schools performed as well as their peers in traditional public schools, but that charter school students eligible for free lunch and those in urban areas performed worse. Multi-state analyses have also found that, when achievement is examined at one point in time, students who attend charter schools do not do as well as those in regular public schools (Finnigan et al. 2004; Loveless 2003). Two recent reviews of the literature confirm that finding (Hassel 2005; Carnoy et al. 2005).

As critics of the AFT report rightfully pointed out, however, analyses of charter school achievement that only examine levels of achievement are inadequate because they do not take selection bias into account. Charter schools typically serve students who are not doing well educationally, depressing—at least initially--charter school test scores (Solomon, Paark, and Garcia 2001). A more accurate way to gauge charter achievement, researchers argue, is to analyze the test score gains that schools produce (Hassel 2005). While most researchers concur that selection effects necessitate gain score analyses, the controversy surrounding charter school achievement has been in calculating and interpreting charter school gains.[3]

For example, the two most recent reviews of the charter school literature (Hassel 2005; Carnoy et al. 2005) differed in their interpretation of the research on charter school gains. The Hassel study focused more on laying out the various approaches to charter school research and pointing out the merits and drawbacks of each. The purpose of the review, Hassel explained, was not to answer the question "how are charter schools doing," but "how well *chartering*, as a policy, is working for a state"(1). In contrast, the Carnoy et al. examination was focused on the politics of the charter school debate and the different methods that researchers utilize to study charter achievement. More so than Hassel, their review attempted to aggregate study results to generate an overall picture of charter achievement, though their discussion does include a careful consideration of the various methodological approaches.

Both reviews found a mixed record for charter schools across multiple states and various methods of analysis, but the Hassel model was generally more optimistic in interpreting study findings. Of the 21 studies Hassel reviewed that examined

achievement over time, nine found more substantial gains for charter students compared to students in traditional public schools, three found larger gains for particular groups of charter students, five found similar gains, and three found larger gains for traditional public school students (Hassel 2005: 7). "While the change-over-time picture is somewhat mixed," remarked Hassel, "in general it is very encouraging about the gains students are making in charter schools" (Hassel 2005: 7).

In contrast, Carnoy et al. found little evidence that charter schools produced larger gains than traditional district schools. The review examined 19 studies in 11 states and the District of Columbia and found that "some studies do show positive gains for students in charter schools relative to students in public schools, but most do not" (Carnoy et al., 2005: 106). According to Carnoy et al.'s method of interpretation, which was focused on the statistical significance of the charter effect, only one study of 19 found significantly positive gains overall and two found that charters had "slightly higher" gains than comparable traditional schools.

Research on California Charter Schools

The research on California charter school achievement is also inconclusive. Slovacek, Kunnan, and Kim (2002) used Academic Performance Index scores from 1999-2001 to compare charter schools that serve disadvantaged students to public schools with similar demographic characteristics. They found that, among schools that enroll 50% or more students eligible for free and reduced price lunch, charter school API means increased more than regular public schools (22.6% gain vs. 19.4%). As Carnoy et al. (2005) point out, even if Slovacek, Kunnan, and Kim's gain measures are accurate, the

difference is so small that charter schools would need 20 years to reach the same level of achievement as comparable public schools (p. 84).

Raymond (2003) compares API performance and API growth in charter schools, regular public schools, and "local competitor" schools, or schools in districts with at least one charter school, at the elementary, middle, and high school levels. She found that elementary and middle charter schools have lower API scores than regular public schools, but the difference was not significant. Charter elementary and middle schools outperformed their local peers on API performance. With regard to API gains, charter school gains were not significantly different at the elementary level but were significantly lower for middle schools. Charter high schools posted gains that were significantly larger than regular public schools and local competitors.

Rogosa (2003) asserted that Raymond's method of assessing student gains was faulty and that her estimates were therefore misleading, particularly at the high school level. Using composite scores from California's reading, math, science, and social studies assessments, Rogosa found that, on average, charter school students have lower scores than district students. He also found that disadvantaged white and black students in charter schools performed as well as their comparable peers in district schools, while disadvantaged Asian and Latino students performed slightly worse. Using achievement data from 1999-2002, Rogosa also analyzed charter school student gains over time compared to student progress in regular public schools. He found that students in charter schools posted similar gains to those in regular public schools, and that students in the most disadvantaged charter schools posted larger gains. Charter school gains were higher for students in grades 2-6, while gains for charter high school students lagged behind.

Research on California Conversion Charter Schools

Two existing studies have examined conversion charter school achievement.[4] Loveless (2003) examined data from 66 conversion and 66 start-up charter schools. The study found that conversion charter schools are generally larger than start-ups, that they serve a higher proportion of minority students, and that they are more likely to be located in an urban area. Loveless found that charter schools as a whole (conversions and start-ups) did not score as well as regular public schools but that gains in all three types of schools were similar. Without adjusting for race and socioeconomic status, conversion achievement was comparable to that in start-up charter schools. Once demographic controls were introduced, however, Loveless found that conversion charter schools consistently outperformed start-up charter schools in all three years.

The other analysis that disaggregated conversion and start-up schools, conducted by RAND in 2003, examined charter school enrollment, achievement, governance, and staffing and found that, on balance, charter schools are performing about as well as traditional schools (Zimmer et al. 2003). According to Zimmer et al., even though start-up charter schools outnumber conversion charters by more than 2 to 1, more than two-thirds of elementary school charter school students attended conversion charters in 2002 (less than half of middle school charter students attended conversions). After removing cyber-charters serving home-schooled students from the analysis and looking at only those charters that offered classroom instruction, the RAND study found that elementary school conversions outperformed start-ups in math and produced similar results in reading.[5] At the secondary level, start-ups outperformed both conversions and regular public schools in both math and reading.[6]

The RAND study also examined charter school staffing. Charter school proponents argue that the freedom that charter schools enjoy enables them to circumvent teacher certification requirements and "hire unusually talented and dedicated teachers" (Carnoy et al. 2005: 3). Zimmer et al. (2003) found that, in terms of both experience and credentials, conversion charters more closely resemble traditional public schools than do start-up charters. According to the RAND data, the average conversion school teacher has 11.4 years of experience compared to just 8.7 years for start-up teachers, a significant difference. The figure for teachers in traditional public schools was 13.6 years. Whereas 88% of conversion school teachers had a full credential, which was slightly higher than even the percentage at regular public schools, just 67% of start-up teachers were fully credentialed.

Methods

As noted above, this study investigates two research questions. The first is: what happens when public schools convert to charter schools? The second is: how do start-up charter schools and conversion charter schools differ? Ideally, to answer the first question, we would have randomly assigned schools to charter and control conditions when the California charter law was passed in the early 1990s and then tracked their progress over time. Not being able to do that, we examined data from a sample of conversion charters from 1986-1989, before they had become charter schools, and compared them to data from a more recent time period, 2001-2004. To investigate the second research question, we compared start-ups and conversions in 2001-2004.

We gathered data from a number of sources. For student achievement, we used California Assessment Program (CAP) data from 1986 to 1989 and Standardized Testing and Reporting (STAR) data from 2001 to 2004, both from the California Department of Education (CDE). The STAR program employed the Stanford Achievement Test (SAT-9) in 2001 and 2002 and the California Achievement Test (CAT/6) in 2003 and 2004. To address the problem of comparing schools on different tests, we limited the analysis to an elementary grade, third grade, and computed state percentile scores for each of the tests, ranking all schools in the state. Reading and math scores were averaged, creating a single composite. The outcome in question, then, is whether schools moved up or down in relative ranking to other California schools. We know of no reason why any of the tests would benefit or disadvantage conversion or start-up charters. The three tests were used by state education officials to monitor student achievement in the state and thus were administered in all California schools.

For teacher characteristics, we obtained California Basic Educational Data System (CBEDS) data for 1987-1989 from Wayne Dughi at the CDE, and for the most recent four years of data, 2001-2004, from CDE's website. CBEDS is an annual survey of teachers that gathers information on teacher assignment, certification, tenure, education, and experience for each teacher in the state of California. For student and school demographic data, we used Common Core Data (CCD) from the National Center for Education Statistics (NCES), which provides information on race and ethnicity, enrollment, and federal free and reduced lunch program eligibility. With all of the data, we computed school level variables for the analyses.

Initially, we identified 93 traditional schools that have converted to charter school status and are currently operating. The analysis is limited to schools with a full panel of data--3rd grade test scores, demographic data, and data on teacher characteristics for both the past (1986-89) and contemporary (2001-04) time periods--restricting the dataset to 49 conversion charter schools. For the second analysis, 57 start-up charter schools were identified with a full panel of data for 2001 to 2004.

A few data notes worth mentioning concern school socioeconomic status (SES), which we model using the percentage of students eligible for the free and reduced lunch program. The state used different measures of SES in the different time periods, necessitating the creation of a new variable.[7] Initially, we gathered the reported free lunch data from the CCD. Since charter schools do not always participate in the free lunch program, this value almost surely is not an accurate representation of the SES of charter schools. To address this issue, we calculated the average percent free lunch for the zip code in which each charter school is located. Our final measure of SES is the larger of the zip-code estimate and the originally reported value.[8]

Another limitation concerns all of the demographic statistics. The latest data available are from 2003. The analysis of 2004 test scores therefore relies on demographic data from 2003.

Discussion of Data

Table 1 reports the mean state percentile rankings of third graders in the sample of 49 conversion charter schools. The top section of the table shows the schools performed from 1986-1989, when they were regular public schools. The lower section of the table

shows how they performed from 2001-2004, when the schools were functioning as charter schools. In both time frames, the conversions scored slightly higher in reading than in math although the 2004 scores indicate a possible change in that trend. The average composite score, combining reading and math, was 38.9 in 1986-1989. Fifteen years later, in 2001-2004, the schools scored 43.0. In other words, the conversions scored four percentile points higher as charter schools than they had as traditional public schools in the 1980s. To place these gains in perspective, at the same rate of progress it would take the schools another 30 years to score at the same level as the average school in the state (50^{th} percentile).

The gains indicate institutional improvement at these schools but do not necessarily mean that they are doing a better job of educating students. Perhaps they began attracting different kinds of students after becoming charter schools. Demographic characteristics of schools are highly correlated with test scores. Did the characteristics of students at the conversions change from when they were regular public schools in the 1980s to when they were charter schools in the 2000s? In the students they serve, how do the conversions compare with other schools in California?

Table 2 presents data on several characteristics. In pre-conversion 1989, the conversions served a larger proportion of black (25.8%) and Hispanic (31.8%) students than the average California school (8.3% and 28.5%, respectively). The schools also served fewer white and Asian students than the average school. In 2003, conversions continued to enroll more blacks and Hispanics than the average California school. Hispanic and black students made up about 65% of enrollment in conversions, compared to about 51% as the state average. The racial and ethnic composition of conversions

appears driven by where the conversions are located. More than six out of ten conversions are located in urban communities, compared to 43.2% of schools in the state. Nearly one-third (28.6%) of conversions are in suburbs vs. 47.7% statewide. The conversions also serve more children who qualify for free lunch than the average school in the state (62.5% vs. 53.1%).

In 1989, conversions were about the same size as the typical California school. In 2003, the median conversion, serving 641 students, was much larger than the typical California school, which served 572 students. Conversions added 116 students from 1989 to 2003 while the median California school gained 44 students. When converting to charter status, schools may grow by expanding the number of grades they offer. Are the conversions' enrollment gains due to adding grades or to more students attending existing grades at the schools? The figures for enrollment per grade level confirm that additional grades are not the reason for the enrollment gains. Whether measured by total school enrollment or enrollment per grade, conversions are 12% to 13% larger than the typical California school and have added almost three times as many students from 1989 to 2003.

In Table 2, student teacher ratios are reported as a proxy for class size. All California schools housing a third grade significantly reduced class sizes from 1989 to 2003, with the student-teacher ratio dropping from 24.9 student per teacher in 1989 to 19.2 students per teacher in 2003. Conversion student-teacher ratios followed a similar trend. The California Class Size Reduction initiative was launched in 1996, offering financial incentives to districts for reducing class sizes to twenty students or less in grades K-3. Later conversion charters (after 1996) probably reduced class sizes before

converting to charter status. Earlier conversions, once chartered, may have welcomed the state's financial inducement or felt it necessary to decrease class sizes in order to compete with local public schools. Regardless, it is noteworthy that class sizes of twenty or fewer students is an innovation that emanated from the highest levels of public school governance—in this case, the state legislature and governor's office--and then influenced the behavior of charter schools. Charters are designed, in part, to be autonomous from the traditional system of school governance.

It does not appear that the test score gains of conversion charters can be explained by changes in the demographic or enrollment characteristics of schools. Table 3 presents information on teachers, a second area to look for changes that may affect test scores. Charter schools have greater freedom in hiring teachers than do conventional public schools. Generally, charters do not need to hire certified teachers, union members, or candidates screened and dispatched by a district personnel office.

Conversion charters are just as likely as traditional public schools to employ teachers with elementary teaching certificates (91.4% of faculty). They are more likely to have teachers who are certified in bilingual education, 27.6% of teachers vs. a 13.8% average statewide, consistent with the large Hispanic student population reported in Table 1 above. Teachers in conversions are less likely to have tenure. The 39.3% tenure rate in 2003 is down substantially from 74.2% in the same schools in 1989 and considerably lower than the state average of 66.5%. Conversions have apparently used their flexibility over personnel policy to hire less experienced teachers. But the point must be qualified. Teachers at conversions have significant experience, with 10.8 years of teaching behind them; however, this is about two years less experience than teachers have at the typical

school in California (12.7 years) and down sharply from the 14.5 years of experience that faculties at the conversion schools possessed in 1989.

About one-quarter of teachers in conversions hold at least a masters degree, comparable to the 27.6% state average. Fewer white teachers and more teachers of color work in conversions. About 32% of teachers in conversions are black or Hispanic compared to 21% statewide.

In sum, the gain in test scores that conversions evidence after becoming charter schools cannot be easily explained by changes in the characteristics of students or teachers, at least in the characteristics on which officials routinely collect data—race, ethnicity, teaching credentials, tenure status, and the like. Conversions are more likely to be located in urban communities and to serve poor and minority children than the average California school—all factors that are negatively correlated with test scores. Conversion charters are slightly larger than the typical California school and have slightly smaller classes, but these differences would not influence test scores much, and changes in conversions on these statistics mirror what happened to most schools statewide since the 1980s. Teachers in conversions are somewhat less experienced and less likely to hold tenure as teachers in the average California school. Nevertheless, conversion teachers have an average of 10.8 years teaching experience, are equally likely to hold a masters degrees, and are credentialed at the same level as teachers in traditional public schools. In short, nothing in the data on the students that conversions serve or the teachers that they employ suggest that conversion charters benefited from a demographic or staffing advantage from 1989 to 2003.

Comparing Conversions and Start-ups

The four percentile increase represents a gain made by conversion charters compared to all other schools in the state. The gain occurred after converting to charter status. Is it simply becoming a charter school that enhanced these schools' performance? Comparing conversion and start-up charters begins to address this question. Start-ups have no institutional past. Starting from scratch, they hire teaching and administrative staff, develop curriculum, make instructional decisions, and decide on school policies. Chartering may free public schools from bureaucratic constraints on these matters, but even as conversions the schools may be encumbered by deeply institutionalized practices that they are reluctant to change.

Tables 4-6 compare conversions and start-ups on the same characteristics examined above, with the conversion school data from Tables 1-3 duplicated here for the ease of comparison. Table 4 presents test scores from 2001 to 2004. Start-ups scored almost 9 percentile points higher than conversions during this period (51.9 vs. 43.0). Start-ups also gained more, 5.1 points, compared to the conversions' gain of 1.5 points. Start-ups moved from below the state average in 2001 (49^{th} percentile) to above the state average in 2004 (54^{th} percentile). The gain was fueled by rising math scores, with reading scores only nudging ahead one point. Despite the gains, math is a weakness for the start-ups. An extraordinary gap exists between math and reading scores. Students at start-ups are above average readers, in 2004 scoring at the 63^{rd} percentile, but below average in mathematics, scoring at the 45^{th} percentile.

Start-up charters have a different demographic profile than conversions (see Table 5). Start-ups have a much larger proportion of white students (54.1% vs. 30.2% in 2003) and fewer black (13.6% vs. 20.5%) and Hispanic (22.8% vs. 44.4%) students. They are less likely to serve students on free lunch (43.7% vs. 62.5%), less likely to be located in an urban community (40.4% vs. 61.2%), and more likely to be found in rural areas (19.3% vs. 10.2%). Table 5 also shows that start-ups are very small schools, less than half the size of the typical conversion, with the median start-up enrolling 245 students in 2003. On all of these characteristics, conversions look much more like the typical California school than do start-ups.

Conversions and start-ups also differ on teacher characteristics (see Table 6). Conversion teachers are more likely to hold an elementary teaching certificate (92.3% vs. 81.2% in 2004), are more likely to be tenured (38.1% vs. 12.6%), and are less likely to be probationary teachers (13.7% vs. 19.9%). Conversion teachers are more experienced, with 10.6 years of teaching experience compared to 7.9 years of teaching for the typical teacher at a start-up. Again, conversions are closer to state averages on these characteristics than are start-ups. In terms of the ethnic and racial characteristics of the instructional staff, black and Hispanic teachers are almost three times more likely to work in conversions (32.6%) than in start-ups (12.2%). The state average of 17.9% falls between these two figures.

The demographic characteristics of start-ups are correlated with higher test scores, but the relative inexperience and lack of credentials of their teaching staff could present a drag on achievement. Tables 7-9 exhibit regression data to parse out these effects. Tables 7 and 8 display output from regressing test scores for 2001 and 2004 on

demographic and staffing characteristics. Table 9 analyzes gains from 2001 to 2004. The regressions utilize data from approximately 5,000 schools in California containing a third grade. Dummy variables were assigned to conversion and start-up charter schools to isolate their performance. Examining 2001 and 2004 scores and the gains made between the two years may seem redundant. We regressed both levels and gains because of the lack of explanatory power of the gains analysis (the most comprehensive model produced an R^2 of less than .03) and because, with some of the variables, the two approaches may lead to different interpretations of effects.

Several findings stand out. First, conversion charters outperform start-ups when demographic characteristics are controlled. In Table 7, the coefficients from Model 1 reflect the raw test score data for conversions and start-ups that were previously reported in Table 4. In 2001, the 49 conversion and 57 start-up schools in the sample scored about 7 ¾ points and 1 ½ points, respectively, below the state average.[9]

Model 2 introduces schools' demographic variables as controls, allowing the model to explain more than 75% of the variance in test scores among schools in the state (R^2 =.761). The socioeconomic differences of start-ups and conversions becomes evident, and, as is usually the case in regression analyses of school test scores, such differences have a large effect. Although start-ups scored at about the 49th percentile in terms of raw scores, the start-up coefficient (-11.81) indicates that they performed 11.8 percentile rankings below the average school in California with the same demographic profile (in other words, among these peer institutions, they scored at the 38th percentile). Conversions scored about four percentile points above the average school with similar racial, ethnic, and free lunch statistics (at the 54th percentile).

Comparing these figures with the same model's output in Tables 8 and 9 reveals the change in charter effects from 2001 to 2004. As shown in Table 8, and again controlling for school SES, conversions slipped a half percentile point from 2001, while start-ups scored at the 46th percentile, a gain of approximately eight points. The Model 2 regression in Table 9, which uses gains as the dependent variable, estimates that start-ups gained about six points and conversions about 1.8 points.

Since the school level characteristics are expressed as percentages, dividing the coefficients by 10 reveals the effect of a ten percent increase in explanatory variables. Model 2 in Table 7 provides a good illustration. With the other demographic variables held constant, increasing the proportion of black students by 10% is associated with a decrease in school test scores of about 2.7 percentile points, increasing the percentage of Hispanic students by 10% is associated with a decrease in test scores of about 3.0 points, and increasing the percentage of Asian students by 10% is associated with an increase in test scores of 0.8 points. Increasing the percentage of students who are eligible for free lunch by 10% lowers test scores by about 5.3 points.

Note that the coefficients for specific demographic variables are different in 2001 and 2004, though as a cluster of socioeconomic influences, the effects remain strong. When modeling gains (see Table 9), they weaken dramatically.[10] The percentage of students eligible for free lunch is positively associated with gains, indicating that California schools with larger numbers of students in poverty (holding racial composition constant) were more likely to make achievement gains from 2001 to 2004. A ten percent increase in free lunch eligibility in 2001 predicted a 0.4 to 0.5 percentile gain in test scores by 2004. When compared to traditional schools also serving large numbers of

poor and minority students, conversion charters made average gains from 2001 to 2004. Start-ups, serving more advantaged students, made significantly greater gains from 2001 to 2004 than schools with a similar demographic profile.

Model 3 includes two measures of student enrollment—school size (a log transformation of school enrollment) and class size (pupil-teacher ratio). Let's examine the output for these two variables in Tables 7, 8, and 9. Neither has much substantive effect on achievement, as Model 3 adds little to the variance explained by Model 2. In Table 7, the positive effect of school enrollment in Model 3 is statistically significant. That runs against conventional wisdom, but also note that the direction of the effect reverses in the analysis of 2004 test scores (see Table 8). Larger school size does appear to work against achievement gains, as reported in Table 9. The statistically significant -1.32 coefficient in Model 3 should not be construed as indicating real-world significance. It indicates that a 10% increase in student enrollment is associated with a .13 percentile decrease in test scores. Doubling a school's enrollment would decrease test scores by 1.3 points.

Larger pupil-teacher ratios appear to depress scores, but only marginally. The coefficient in Table 7, Model 3 indicates that a school managing to reduce its student-teacher ratio by one student—approximately the difference between conversions and the average school in the state--would expect a 0.14 percentile increase in test scores. Recall that schools statewide reduced the number of students per teacher by 5.7 from 1988 to 2003. This coefficient suggests that the average school making the same reduction—while holding other variables constant--would raise test scores by less than one percentile

point (0.8). The figures in Table 9 show that, holding other variables constant, schools with higher student-teacher ratios actually made slightly greater gains from 2001 to 2004.

Model 4 brings teacher characteristics into the analysis. As shown in Table 7, the variables related to credentials were all positively related to achievement in 2001—the percentage of teachers holding a masters or higher degree (education), elementary certification, tenure, or bilingual certification. The average years of teaching experience for a school faculty is also associated with higher test scores. For the most part, these characteristics remain positive in the 2004 analysis (see Table 8), save for the percentage of teachers with tenure, which completely reverses to have a negative effect.[11] But as Table 9 shows, most of the teacher characteristics are either neutral or negatively related to gains. Only the percentage of teachers with a bilingual certificate remains positive and is statistically significant. A ten percent increase in teachers holding bilingual certification produces about a 0.6 percentile increase in test score gains.

Conclusion

In this study, we compared the achievement test scores of forty-nine conversion charter schools in California before and after they converted. Test scores rose about four percentile points from the four year period, 1986-1989, when the schools were traditional public schools, to 2001-2004, when the schools were functioning as charters. There were no changes in enrollment data, the demographic mix of students, or the credentials and experience of teachers that explain the test score gains. Conversions are a little more than 12% larger than traditional public schools in California. They tend to be located in urban areas, and poor and minority youngsters make up a greater proportion of student

enrollment than at the typical California school. The teachers at conversion charters hold degrees and credentials comparable to teachers at traditional public schools and have only slightly less teaching experience. Of course, given the limited data available, we cannot rule out changes in unobserved characteristics that may have influenced the results. In addition, the results could have been swayed by either students or teachers self-selecting into schools.

We also compared performance of the conversions with fifty-seven start-up charter schools from 2001-2004. Both groups registered test score gains during the period, conversions of 1.5 percentile points and start-ups of 5.1 points. The larger start-up gain is surprising for two reasons. Start-ups serve an above average socioeconomic population of students, yet across the state, test score gains from 2001-2004 were more pronounced in low SES schools. Teachers at start-ups are less experienced and less likely to be fully credentialed than teachers at conversions. However, start-up teachers did improve on teacher characteristics from 2001-2004, the most significant change being the drop in probationary teachers from 31.4% in 2001 to 19.9% in 2004. In 2001, 34 of the 57 start-ups had been open no more than three years, and in the subsequent three years, the schools and their teaching staffs had the opportunity to mature.

The results of the study are positive for charter schools. Conversions have gained over the long term, and both conversions and start-ups have improved over the short term. Since we expressed test scores as state percentile rankings, the gains made by charters represent gains relative to the performance of California's traditional public schools. It is important to place these gains in context, however, and especially to consider them in light of chartering as an NCLB remedy. As noted in the discussion

above, at the rate of progress estimated in the current study, it will take conversion charters another thirty years before reaching the state average in academic achievement. An even more sobering consideration is that, by our calculation, 114 of California's traditional public schools in our dataset are either in year four or five of NCLB remedies—thus eligible for conversion.[12] We estimate that in 2004 they scored at the 12th percentile. A four percentile point gain in fifteen years—or, for that matter, an eight percentile gain in thirty years--is not going to turn these into great schools or even raise them to a minimally acceptable level.

Charter school supporters may respond by arguing that slow progress is better than no progress at all. The other remedies under NCLB—such as reconstituting schools with new teaching staffs, contracting with educational management organizations, or having the state takeover schools—are not supported by research showing that they lead to swifter or surer improvement. Supporters may also point out that the recent progress of start-ups has been impressive. To the extent that NCLB conversions will more closely resemble start-ups, future conversion schools may gain more than those in the past. A recent report from the Education Commission of the States recommends that states implement procedures to ensure that schools are not converted to charters in name only, making clear "the various autonomies that will be granted to the school, especially regarding budgeting, staffing, scheduling, and curriculum and instruction." (Ziebarth 2004: 7).

The conversion option may look cost efficient compared to other state policy initiatives with elementary schools. The annual cost of class size reduction in California dwarfs the state's cost of supporting charter schools. And yet evaluations of the class size

reduction program have yielded inconclusive results. But policy makers need better information to evaluate the costs and benefits of competing programs. To date, only one study of charters, Caroline M. Hoxby and Jonah E. Rockoff's study of Chicago charter students, has employed a randomized design to control for the effects of students self-selecting into schools (Hoxby and Rockoff 2004). A project with a randomized design, collecting longitudinal data over an extended period of time, would help answer many of the still unanswered--and still hotly debated--questions about charter schools.

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Table 1: Test Scores of Conversion Charters, 1986-1989 & 2001-2004

3rd grade State Percentile Ranks	**1986**	**1987**	**1988**	**1989**	**Average 1986-1989**
N=49					
Composite	41.0	38.7	38.2	37.8	38.9
Math	40.8	37.6	35.7	35.7	37.5
Reading	41.2	39.8	40.6	39.9	40.4
	2001	**2002**	**2003**	**2004**	**Average 2001-2004**
N=49					
Composite	42.4	41.7	44.4	43.5	43.0
Math	40.4	40.5	44.1	43.6	42.2
Reading	44.4	42.9	44.6	43.4	43.8

Source: Authors' calculations, California Assessment Program (CAP) and Student Testing and Reporting (STAR) data, California Department of Education

Table 2: Demographic and Enrollment Statistics, Conversions vs. State means, 1989 & 2003

	State		Conversions	
3rd grade	**1989 (N=4570)**	**2003 (N=5153)**	**1989 (N=49)**	**2003 (N=49)**
Demographics				
White (student)	53.0%	35.7%	37.6%	30.2%
Hispanic (student)	28.5%	43.1%	31.8%	44.4%
Black (student)	8.3%	8.0%	25.8%	20.5%
Asian (student)	9.3%	11.0%	4.5%	4.1%
Free Lunch (est.)	n/a	53.1%	n/a	62.5%
Community				
Urban	n/a	43.2%	n/a	61.2%
Suburban	n/a	47.7%	n/a	28.6%
Rural	n/a	10.1%	n/a	10.2%
Enrollment				
Median Enrollment	528	572	525	641
Median Students per Grade (calculated)	79.2	86.9	74.1	98.3
Student/Teacher Ratio	24.9	19.2	24.9	18.1

Note: The state statistics are limited to schools with both demographic (CCD) and staffing (CBEDS) data.
Source: Authors' calculations, Common Core Data, NCES; California Basic Educational Data System, California Department of Education.

Table 3: Teacher characteristics, Conversions vs. state means, 1989 & 2003

	State		Conversions	
3rd grade	**1989 (N=4569)**	**2003 (N=5152)**	**1989 (N=49)**	**2003 (N=49)**
Certified in Elementary	93.8%	92.8%	92.2%	91.4%
Certified in Bilingual Education	5.1%	13.8%	8.1%	27.6%
Tenured Status	74.6%	66.5%	74.2%	39.3%
Probationary Status	17.1%	16.7%	15.5%	16.2%
Number of Years Teaching	14.0	12.7	14.5	10.8
Education – Master's	28.2%	27.6%	26.3%	24.8%
White	79.5%	72.0%	70.8%	61.1%
Hispanic	7.8%	16.3%	7.9%	17.0%
Black	6.1%	4.5%	16.1%	15.4%
Asian	3.9%	5.0%	3.7%	4.6%
Female	85.3%	85.6%	85.6%	84.7%
Male	14.7%	14.4%	14.4%	15.3%

Source: Authors' calculations, California Basic Educational Data System, California Department of Education.

Table 4: Test scores of conversion and start-up charters, 2001-2004

3rd grade State Percentile Ranks

Conversions	**2001**	**2002**	**2003**	**2004**	**Average 2001-2004**	**Gains 2001-2004**
N = 49						
Composite	42.4	41.7	44.4	43.5	43.0	1.5
Math	40.4	40.5	44.1	43.6	42.2	3.2
Reading	44.4	42.9	44.6	43.4	43.8	-1.0
Start-ups	**2001**	**2002**	**2003**	**2004**	**Average 2001-2004**	**Gains 2001-2004**
N = 57						
Composite	48.7	48.2	56.8	53.8	51.9	5.1
Math	35.5	36.6	46.2	44.7	40.8	9.2
Reading	61.8	59.7	67.3	62.8	62.9	1.0

Source: Authors' calculations, Student Testing and Reporting (STAR) data, California Department of Education

Table 5: Demographic and enrollment statistics, start-ups vs. conversions, 2001 & 2003

	Start-ups		Conversions	
3rd grade	**2001 (N=57)**	**2003 (N=57)**	**2001 (N=49)**	**2003 (N=49)**
Demographics				
White (student)	57.0%	54.1%	31.8%	30.2%
Hispanic (student)	21.3%	22.8%	41.5%	44.4%
Black (student)	11.7%	13.6%	22.0%	20.5%
Asian (student)	3.4%	4.0%	4.0%	4.1%
Free Lunch (est.)	41.3%	43.7%	63.3%	62.5%
Community				
Urban	47.4%	40.4%	59.2%	61.2%
Suburban	31.6%	40.3%	30.6%	28.6%
Rural	21.0%	19.3%	10.2%	10.2%
Enrollment				
Median Enrollment	227	245	632	641
Median Students per Grade (calculated)	26.0	28.9	94.1	98.3
Student/Teacher Ratio	19.3	18.8	18.1	18.1

Source: Authors' calculations, Common Core Data, NCES; California Basic Educational Data System, California Department of Education.

Table 6: Teacher characteristics, Conversions vs. start-up means, 2001 & 2004

	Start-ups		Conversions	
3rd grade	**2001 (N=57)**	**2004 (N=57)**	**2001 (N=49)**	**2004 (N=49)**
Certified in Elementary	78.9%	81.2%	92.3%	92.3%
Certified in Bilingual Education	2.9%	6.7%	23.5%	29.9%
Tenured Status	8.3%	12.6%	55.9%	38.1%
Probationary Status	31.4%	19.9%	16.6%	13.7%
Number of Years Teaching	7.0	7.9	10.4	10.6
Education – Master's	19.5%	26.4%	23.3%	24.3%
White	80.9%	84.0%	59.9%	60.0%
Hispanic	8.3%	8.0%	13.7%	17.7%
Black	5.7%	4.2%	15.7%	14.9%
Asian	2.3%	1.4%	4.7%	4.6%
Female	78.4%	82.3%	81.9%	85.7%
Male	21.6%	17.7%	18.1%	14.3%

Source: Authors' calculations, California Basic Educational Data System, California Department of Education.

Table 7: 3rd grade test scores regressed on school characteristics, 2001 (n=4980)

explanatory variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	50.18	91.67	88.17	63.78
Conversion	-7.76	4.12*	3.98*	4.55*
Startup	-1.52	-11.81***	-11.10***	-5.75**
Black		-26.87***	-27.33***	-25.64***
Hispanic		-29.82***	-30.49***	-30.51***
Asian		7.98***	7.82***	7.11***
Free Lunch (est.)		-53.24***	-53.04***	-51.86***
School Enrollment (ln)			1.02*	1.10*
Pupils per Teacher			-0.14	-0.21*
Teacher Education (Masters)				10.01***
Elementary Cert.				18.34***
Tenure				3.37*
Bilingual Cert.				2.75
Teaching Experience (yrs)				0.15*
R^2	0.0008	0.7607	0.7609	0.7692

* $p < 0.05$
** $p < 0.01$
*** $p < 0.001$

Table 8**:** 3rd grade test scores regressed on school characteristics, 2004 (n=5051)

explanatory variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	50.19	91.36	93.18	85.37
Conversion	-6.70	3.54	3.47	2.87
Startup	3.53	-4.02*	-4.11*	-3.72
Black		-37.65***	-37.50***	-38.09***
Hispanic		-29.98***	-29.71***	-31.28***
Asian		9.12***	9.25***	9.79***
Free Lunch (est.)		-49.22***	-49.38***	-48.18***
Enrollment (ln)			-0.10	-0.07
Pupils per Teacher			-0.06	-0.08
Teacher Education (Masters)				7.87***
Elementary Cert.				3.34
Tenure				-3.62***
Bilingual Cert.				3.89**
Teaching Experience (yrs)				0.36***
R^2	0.0007	0.7208	0.7208	0.7260

* $p < 0.05$
** $p < 0.01$
*** $p < 0.001$

Table 9: 3rd grade gain scores regressed on school characteristics, 2001-2004 (n=4904)

explanatory variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	-0.14	-2.03	3.96	12.84
Conversion	0.98	1.81	1.90	0.95
Startup	5.27**	6.31**	5.41**	3.10
Black		-10.57***	-9.97***	-11.25***
Hispanic		0.07	1.03	-1.18
Asian		1.48	1.79	1.68
Free lunch (est.)		4.88***	4.55***	4.11***
Enrollment (ln)			-1.32**	-1.63***
Pupil to teacher ratio			0.11	0.20
Teacher Education (Masters)				-2.16
Elementary Cert.				-5.61*
Tenure				-1.85
Bilingual Cert.				6.26***
Teaching Experience (yrs)				-0.08
R^2	0.0016	0.0169	0.0184	0.0244

Note: school characteristics based on 2001 data.

* $p < 0.05$
** $p < 0.01$
*** $p < 0.001$

Notes

[1] According to the database, 36 conversion schools were closed, two had their charter revoked, two had it withdrawn, one was inactive, and one was pending.
[2] The study found that of 101 Michigan schools undergoing NCLB-mandated restructuring none are converting to a charter school (Scott 2004).
[3] For a discussion of the problems associated with relying on gain scores, see Raudenbush (2004) and Hoxby and Rockoff (2004).
[4] Slovacek, Kunnan, and Kim (2002) included conversion vs. start-up status as a variable in explaining SAT-9 and API variation. They found that, on SAT-9, start-ups seemed to outperform conversions, but on the API conversion status was not significant (p. 9).
[5] The conversion and start-up schools that used "non-classroom based instruction" did significantly worse than charters with classroom-based instruction (Zimmer et al. 2003: 47-50).
[6] The researchers also compared conversion achievement to start-up achievement in San Diego City Schools and Los Angeles Unified at the elementary level. In San Diego, the conversion charters significantly outperformed start up charter schools, while in LA conversion performance was less impressive.
[7] In the 1980s' CAP data, the state measured SES with a seven-level variable of parental occupation. These student-level data were aggregated to attain a school-level SES statistic.
[8] This approach for estimating free lunch data of charters is explained in greater detail in Loveless, 2001. The estimates are much closer than CCD to free lunch statistics reported in RPP national survey of charter principals.
[9] For the sake of consistency, the dummies reflect conversion and start-up status only for the schools in our sample. Other charters without a complete panel of data were dropped from the regression. The comparison made here, then, is the conversion and start-ups in the sample compared to all other non-charter schools in the state.
[10] Gain scores, in effect, control for characteristics measured at the baseline assuming that the characteristics do not change appreciably over the time interval for which the gain is calculated.
[11] The tenure statistic is surprising volatile. Statewide, the percentage of teachers who were either tenured or probationary dropped 5% from 2001 to 2004. Also, there were more schools in 2004 with no tenured teachers: 266 in 2004, 118 in 2001.
[12] Adequate Yearly Progress, Title I Program Improvement Status from the California Department of Education. Found at: www.cde.ca.gov/ta/ac/ay/tidatafiles.asp