

Evaluating the Impact of Charter Schools on Student Achievement: A Longitudinal Look at the Great Lakes States

Appendix B

June 2007



EPRU | EDUCATION POLICY RESEARCH UNIT

Education Policy Research Unit
Division of Educational Leadership and
Policy Studies
College of Education, Arizona State
University
P.O. Box 872411, Tempe, AZ 85287-
2411
Telephone: (480) 965-1886
Fax: (480) 965-0303
E-mail: epsl@asu.edu
<http://edpolicylab.org>

Education and the Public Interest Center
School of Education,
University of Colorado
Boulder, CO 80309-0249
Telephone: (303) 492-8370
Fax: (303) 492-7090
Email: epic@colorado.edu
<http://education.colorado.edu/epic>

- The policy brief is available online at: <http://epsl.asu.edu/epru/documents/EPSSL-0706-236-EPRU.pdf>

This research was made possible by funding from the Great Lakes Center for Education Research and Practice

Appendix B

Student Achievement in Illinois Charter Schools

Illinois passed its charter school law in 1996. The state's first charter school opened in Peoria during the 1996-97 academic year. Currently, 42 charter agreements have been granted for Illinois charter schools. These schools serve close to 13,000 students.¹ Since 1996, the charter school law has been amended a few times, most recently in 2003. Charter applicants in Illinois may include individuals or organizations—with parents, educators, existing public schools, businesses, colleges, universities, community-based organizations, or partnerships among these. Like other statutes, Illinois also places restrictions on the types of organizations that may authorize charter schools. Under Illinois law, charters are granted primarily by local education agencies (LEAs).

The Illinois charter school law provides a number of mechanisms to facilitate accountability of charter schools. The primary instrument of accountability is the learning goals specified in the charter agreement. Goals for student performance in charter schools are also subject to the Illinois Learning Standards, which define what Illinois public school students should know and be able to do in seven core areas.² Charter schools in Illinois are required to report information for the state's school report card system to the Illinois State Board of Education (ISBE).

There are differing opinions as to perceived strength of the Illinois charter school law. The Center for Education Reform rates Illinois' charter school law as weak, assigning it a "C."³ However, Chi and Welner (in press)⁴ rated Illinois as one of the strongest charter school laws because of issues related to accessibility for all students, particularly at-risk students, as well as rigor of oversight and accountability. Illinois has a cap on the number of charter schools that can be authorized. Specifically, the law allows 15 schools in Chicago, 15 in suburban Chicago, and 15 in the remainder of the state. Determining the actual number of charter schools in operation, however, is confused by the fact that many of the Chicago-based charter schools have opened multiple buildings under the same charter umbrella. Tracking the number of schools is also complicated by the fact that some of the school buildings under the same charter contract have split to operate under separate charter contracts.

Illinois has closed a higher proportion of its charter schools than the other Great Lakes states. Six of the state's charter schools have been closed since 2000, which represents nearly 15 percent of all the schools. These closures represent high standards for accountability and the willingness and ability of the oversight agencies to close charter schools that are not meeting expectations.

A number of studies analyzed student achievement in Illinois. Nelson and Miron (2002)⁵ presented findings from a three-year evaluation of Illinois charter schools. Analysis of the data from the Illinois Standards Achievement Test (ISAT) in this evaluation shows that charter schools performed at or just below the levels of demographically similar noncharter schools. Hoxby and Rockoff (2004) compared the performance of students in one Chicago charter school who were successful in being

admitted through a lottery with those who applied but were not accepted by the lottery. Their study found higher reading scores in the schools that were successful in the lotteries especially in elementary school students.⁶ In 2004, SRI completed an evaluation for the U.S. Department of Education that included state studies of student achievement in 5 states, including Illinois.⁷ This study based on three years of data (1999-00 through 2001-02 school years) focused on the status of charter schools with regard to the state standards. When controlling for proportion of minority and low-income students, charter schools and traditional public schools performed similarly.

More recently, the Chicago Public Schools and Illinois Network of Charter Schools (2006) released a report showing that Chicago charter schools outperformed their comparison neighborhood traditional public schools in reading, science, and math in 2004-05.⁸ This report found that Chicago charter schools had a higher percentage of students meeting and exceeding Illinois Learning Standards for both the ISAT and PSAE composite scores than their comparison neighborhood schools, outperforming them on 86% of the student performance measures. Additionally, students in the eight charter public high schools were more likely to graduate on time than students in neighboring traditional public high schools (75% vs. 54%). This study noted that the relative performance of comparison neighborhood traditional public schools was a “weighted, aggregate average of the performance of the neighborhood schools that the students would most likely have attended if the charter school did not exist” (p. 3). Given that some charter schools are not representative of their neighborhood traditional public schools in demographics, special education and low income enrollment, socioeconomic status, and mobility, these findings should be interpreted with some caution. The Illinois State Board of Education prepares an annual report each year that lists the charter schools and their passing rates together with their respective host district.⁹ No aggregation or summative conclusions of these data are made, however.

Data Sources, Outcome Measures, and Methods for Analysis

We obtained demographic variables from the Common Core of Data at the National Center for Education Statistics (NCES).¹⁰ These include school enrollment, ethnicity, free and reduced lunch, and urbanicity or locale. A variable designating whether or not a school was a charter school or traditional public school was used from this data set to distinguish the charter schools in the state. From the Illinois State Board of Education Web site we obtained student achievement test results.¹¹ Unfortunately, we were not able to secure data on special education and limited English proficiency for most of the years covered in our evaluation. Therefore, these are not considered in the regression models for Illinois.

Because scale scores were not available, the outcome measure used for this analysis was the mean percentage of students that met or exceeded the Illinois Learning Standards¹² as revealed on the Illinois Standards Achievement Test for grades 5 and 8 and on the Prairie State Achievement Examination (PSAE)¹³ for grade 11. The five most recent years of data available for these grades were the 2001-02 through 2005-06 academic years. Table 1 illustrates the range of grades, years, and subjects included in our analyses.

Table 1. Test Data Used in Analyses by Year, Grade, and Subject

	2001-02	2002-03	2003-04	2004-05	2005-06
Grade 5	Reading Math	Reading Math	Reading Math	Reading Math	Reading Math
Grade 8	Reading Math	Reading Math	Reading Math	Reading Math	Reading Math
Grade 11	Reading Math	Reading Math	Reading Math	Reading Math	Reading Math

Variables Used to Create the Predicted Values for Each School

The data set we created for Illinois was rather incomplete, since we were not able to obtain data on special education or limited English proficiency at the building level. Although we could assemble data records for 37 charter schools, during the time period under consideration, only 24 of these schools had both valid test data and information on percentage of low-income and percentage of minority students. This obviously decreased the sample size considerably. Three of the 13 schools that were excluded—due to an absence of data—were closed. Three additional schools that were excluded were relatively new and did not yet have student performance data reported. Seven charter schools that were in operation during the years covered by our analyses were dropped from the sample because of incomplete data, which represents an important limitation. Table 2 displays the variables used in developing the residual gain score analysis for Illinois.

Table 2. Variables Included in Residual Gain Score Analysis for Illinois

<i>Variable</i>	<i>Description</i>
Percentage Passing (Dependent Variable)	Percentage of students meeting or exceeding state standards on the ISAT and the PSAE
Percentage Minority	Percentage of nonwhite and non-Asian-American students enrolled at the school
Percentage Low Income	Percentage of students receiving free or reduced lunch
Urbanicity (Locale)	Rating from 1-8 indicating population density

Table 3 contains tables and line graphs that illustrate our findings across all schools. Actual or observed scores are simply the actual school-level score (i.e., the percentage of students meeting state standards) for each grade and subject-level test. The predicted values were created using an ordinary least squares (OLS) multiple regression procedure, in the form of the linear equation included below:

$$\hat{Y}_i = a + b_1 \text{MINORITY}_i + b_2 \text{LOWINCOME}_i + b_3 \text{URBANICITY}_i + \varepsilon_i$$

Table 3. Illinois Aggregate Results by Grade, Subject, and Year

School Name	Year	Math					Reading				
		Schools	Students	Actual	Predicted	Residual	Schools	Students	Actual	Predicted	Residual
Grade 5	2002	6	326	56.51	58.60	-2.09	6	326	48.75	56.74	-7.99
	2003	9	387	58.13	57.42	0.71	9	387	50.17	50.50	-0.33
	2004	10	642	53.19	68.50	-15.31	10	642	48.13	58.91	-10.78
	2005	10	693	65.16	73.59	-8.43	10	693	56.15	62.95	-6.80
	2006	9	1,351	71.74	65.43	6.31	9	1,351	55.61	54.95	0.66
Average annual change				3.81	1.71	2.10			1.72	-0.45	2.16
Grade 8	2002	9	410	29.76	42.84	-13.09	9	410	57.11	65.30	-8.19
	2003	11	814	26.79	35.65	-8.86	11	814	51.19	54.90	-3.70
	2004	11	1,124	35.95	46.04	-10.09	11	1,124	61.36	64.73	-3.37
	2005	10	1,227	43.59	51.72	-8.13	10	1,227	73.43	73.35	0.08
	2006	11	898	71.74	66.79	4.95	11	898	75.77	72.78	2.99
Average annual change				10.50	5.99	4.51			4.66	1.87	2.79
Grade 11	2002	7	839	13.37	31.67	-18.30	7	839	24.77	40.99	-16.22
	2003	8	835	15.94	34.35	-18.41	8	835	29.82	41.07	-11.25
	2004	10	1,230	18.04	30.55	-12.51	10	1,230	32.64	37.42	-4.78
	2005	9	1,348	19.57	25.53	-5.96	9	1,348	38.69	37.98	0.71
	2006	7	1,446	21.32	18.29	3.03	7	1,446	35.70	28.50	7.20
Average annual change				1.99	-3.34	5.33			2.73	-3.12	5.86

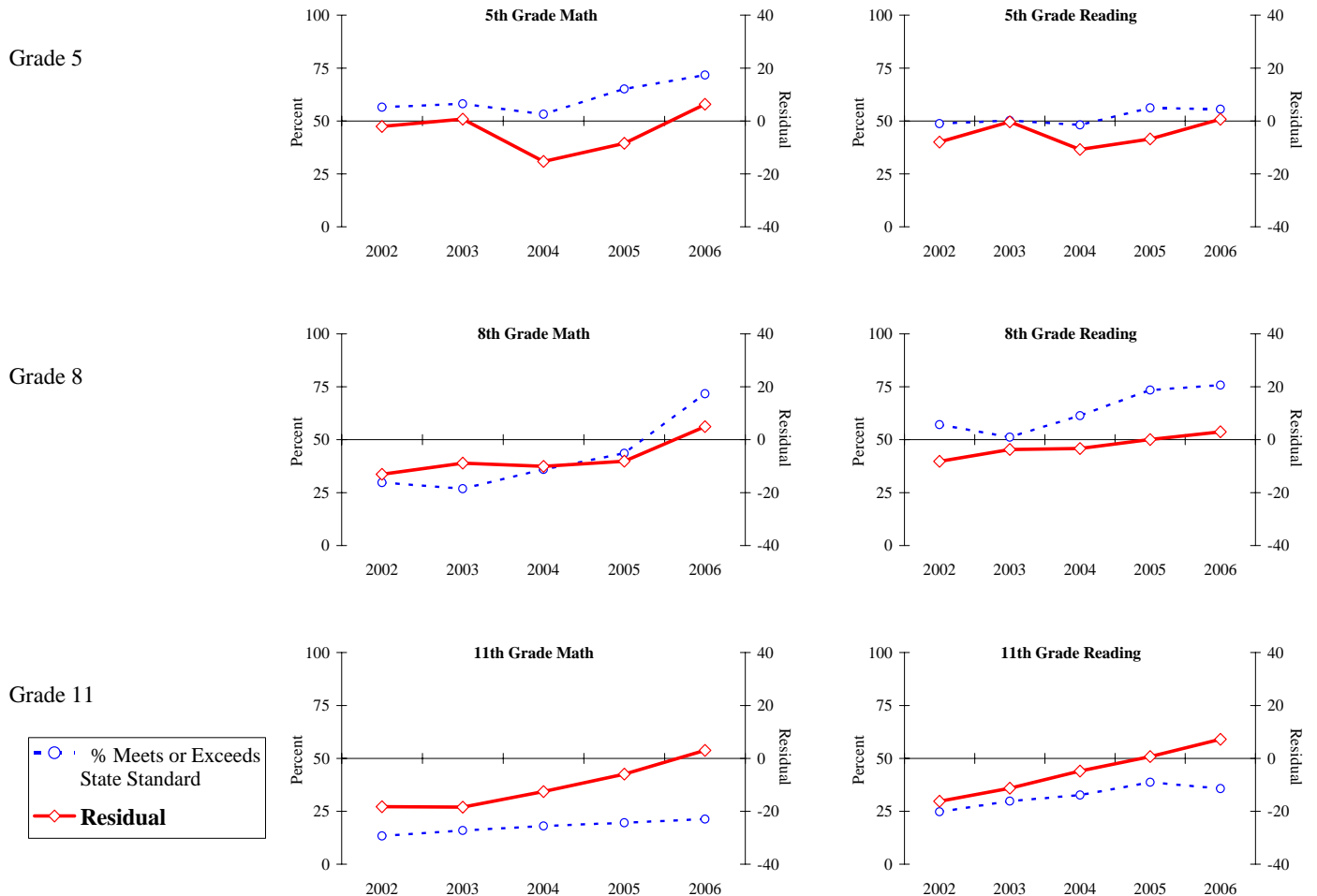


Figure 1. Illinois Aggregate Results: Residual Scores and Percent Meeting State Standards

The variables included in the regression analysis are described in Table 2. Essentially, the predicted values indicate how the school is expected to score based on how other schools in the state with similar demographics have performed on the same test.

The residual is the difference between the actual score and the predicted score. If the residual score is negative, then the school is doing worse than expected. If the residual score is positive, the school is performing better than expected. The rows in the tables contain the average annual change scores, which indicate the relative direction in which the school is moving. For example, the school may have all negative residual scores; but if they are becoming less negative over time, the average annual change score will be a positive number. The average annual change score is computed for patterns of actual, predicted, and residual scores across time by subtracting the first score from the most recent and dividing by the number of observations (e.g., years) minus 1.

It is important to note that the results in Table 3 and Figure 1 are aggregate results across all charter schools with available data. When calculating the aggregate results, we weighted the data by the relative number of test takers per school. For example, if a large school has extremely positive results, it will carry more weight than a small school with less positive results.

Actual Performance and Residual Gains for All Charter Schools

Table 3 and Figure 1 illustrate the overall results aggregated for all Illinois charter schools from 2001-02 to 2005-06 for grades 5, 8, and 11. Data on the number of schools and students included in the results on each of the grade and subject-specific tests are also included in the table.

The dashed line in the charts in Table 3 indicates the actual (i.e., observed) scores for the charter schools. In other words, this illustrates the proportion of students that met or exceeded state standards. Based on these trend lines, we see that between 25 and 75 percent of the students in charter schools—depending on the test—typically are meeting state standards. This is generally lower than the state average (see Figure 2). The charter high schools appear to be serving students who are performing at noticeably lower levels. Nonetheless, the residuals for grade 11 are similar to the residuals for grades 5 and 8; and over time it appears that the grade 11 residuals are improving at a more rapid pace than the other grades.

Figure 2 illustrates the statewide trend in terms of percentage of students meeting or exceeding state standards in math and reading. One should be cautious in using state figures to evaluate charter schools, since the state results include a large portion of schools that are not similar in term of student demographics to charter schools. Our residual gains analyses, however, create a demographically similar comparison group for each and every charter school.

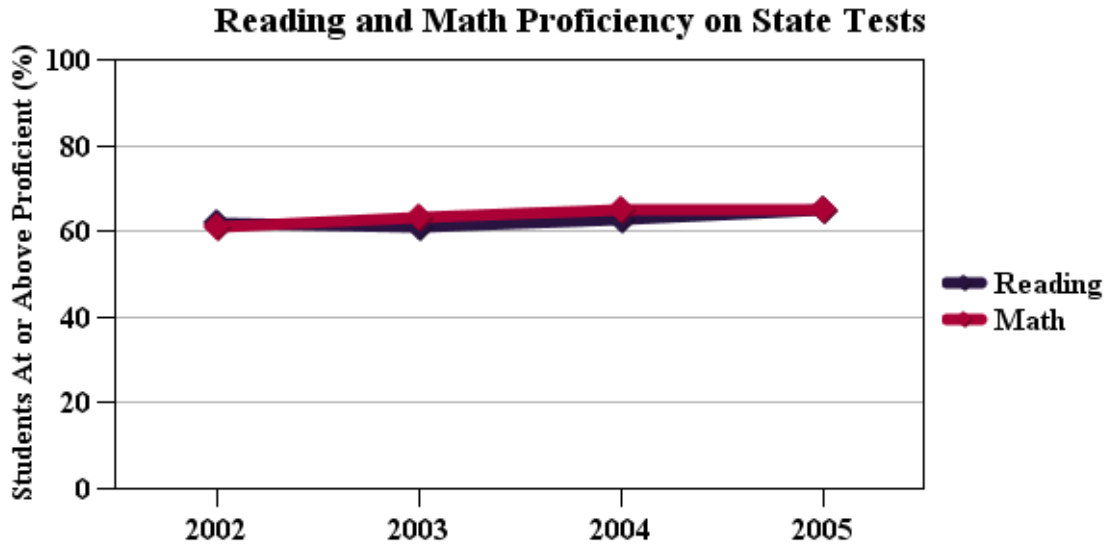


Figure 2. Performance on ISAT and PSAT from 2002-2005¹⁴

Actual Performance and Residual Gains for Same Cohort of Schools

The changes over time depicted in the results from Figure 1 may be due to the addition of new charter schools. The number of schools and the number of students included in each set of results are indicated in Table 3. Between the first and last test dates, from 7 to 19 charter schools were added to the aggregate results. Therefore, changes in overall results may be due to the inclusion of new schools. To control for this we tracked a subset of the same charter schools that had test data available for all years. The results from these aggregate results for cohorts of the same schools over time are included in Table 4 and illustrated in Figure 3.

The total number of schools decreased in these cohorts to 4 or 5 schools, but these schools are relatively large in size. The results in Table 4 are rather similar to the results for all schools presented in Table 3. The dashed line simply indicates the percentage of charter school students meeting or exceeding state standards. The solid red line indicates the residuals, of which are all negative at the beginning of the trends and improve over time to the point where they cross over to becoming positive residuals, meaning that the schools are doing better than predicted, given their demographic composition. Grade 11 results show the largest improvement over time.

Table 4. Illinois Results from Cohorts of Same Schools Tracked Over Time

School Name	Year	Math					Reading				
		Schools	Students	Actual	Predicted	Residual	Schools	Students	Actual	Predicted	Residual
Grade 5	2002	4	282	56.76	58.79	-2.03	4	282	50.60	56.86	-6.26
	2003	4	142	64.31	65.82	-1.51	4	142	56.29	58.89	-2.60
	2004	4	451	52.01	69.96	-17.95	4	451	48.49	60.46	-11.97
	2005	4	480	63.62	73.89	-10.27	4	480	56.00	63.25	-7.25
	2006	4	578	71.50	64.95	6.55	4	578	53.91	54.47	-0.56
Average annual change				3.69	1.54	2.15			0.83	-0.60	1.43
Grade 8	2002	5	296	32.73	46.51	-13.78	5	296	61.58	68.21	-6.63
	2003	5	158	34.67	47.22	-12.55	5	158	58.21	64.39	-6.18
	2004	5	461	42.21	48.88	-6.67	5	461	63.75	67.27	-3.52
	2005	5	512	43.46	51.40	-7.94	5	512	73.75	73.20	0.55
	2006	5	613	71.85	64.29	7.56	5	613	75.26	70.91	4.35
Average annual change				9.78	4.45	5.34			3.42	0.67	2.75
Grade 11	2002	6	811	13.83	31.84	-18.01	6	811	25.26	41.13	-15.87
	2003	6	755	15.89	34.08	-18.19	6	755	29.66	40.85	-11.19
	2004	6	1,106	18.69	30.39	-11.70	6	1106	34.32	37.25	-2.93
	2005	6	1,235	20.89	25.90	-5.01	6	1235	40.36	38.25	2.11
	2006	6	1,390	21.97	18.09	3.88	6	1390	36.07	28.34	7.73
Average annual change				2.03	-3.44	5.47			2.70	-3.20	5.90

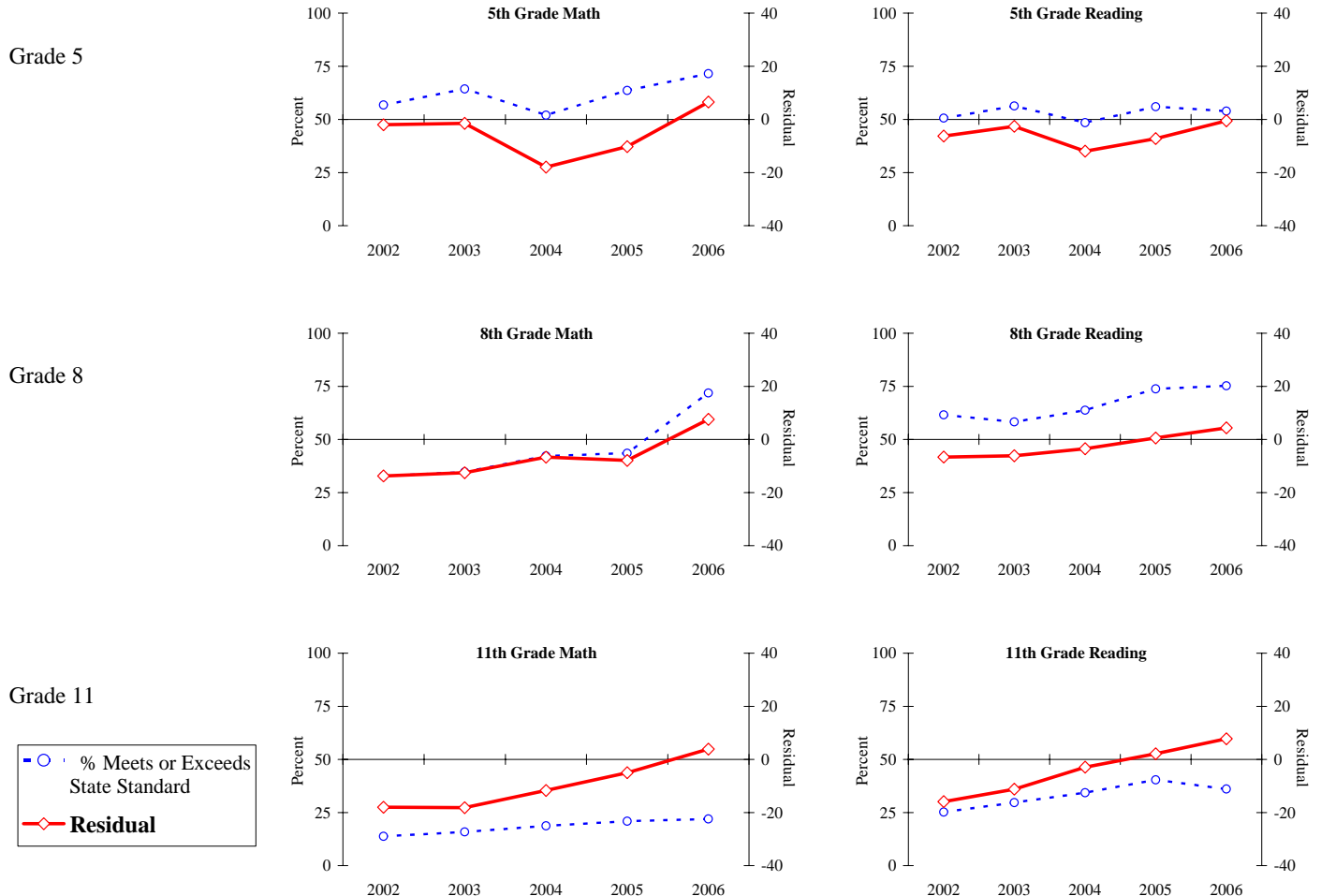


Figure 3. Illinois School Cohort Results: Residual Scores and Percent Meeting State Standards

Summary of Findings from Illinois

Two evaluation questions were asked in this study: (1) How does student achievement in charter schools compare to demographically similar public schools? (2) Are charter schools an effective strategy for improving student achievement over time? Results for these two questions are summarized in Tables 5 and 6. Table 5 presents a cross-sectional comparison of 6 mean test residuals by grade and subject for Illinois charter schools using the most recent year of available data. Results revealed 31 instances in which charter school residuals are positive (i.e., student achievement is higher than expected) and 23 instances in which they are negative (i.e., student achievement is lower than expected). In total, that means that 57 percent of the comparisons favored charter schools.

Table 5. Cross-Sectional Comparison Test Residuals by Grade for Charter Schools Using the Most Recent Year of Available Data (2006)

	<i>Grade 5 Math</i>	<i>Grade 5 Reading</i>	<i>Grade 8 Math</i>	<i>Grade 8 Reading</i>	<i>Grade 11 Math</i>	<i>Grade 11 Reading</i>	<i>Totals</i>
# Schools With Positive Residuals	5	3	7	8	4	4	31
# Schools with Negative Residuals	4	6	4	3	3	3	23

Table 6 presents a comparison of the average annual change in test residuals by grade for Illinois charter and cohort charter schools over five years. Results revealed that the residuals for charter schools overall are increasing by 3.79, and residuals for charter school cohorts are increasing by 3.84. This means that over a five-year period, the trend in student achievement is improving with the largest gains occurring at Grade 11.

Table 6. Comparison of Average Annual Change (AAC) in Test Residuals by Grade for Charter Schools and Charter School Cohorts Over Five Years (2002 to 2006)

	<i>Grade 5 Math</i>	<i>Grade 5 Reading</i>	<i>Grade 8 Math</i>	<i>Grade 8 Reading</i>	<i>Grade 11 Math</i>	<i>Grade 11 Reading</i>	<i>Mean AAC across all tests</i>
Average Annual Change in Residual Scores for All Schools with Available Data	+2.10	+2.16	+4.51	+2.79	+5.33	+5.86	+3.79
Average Annual Change in Residual Scores for Cohort of Same Schools	+2.15	+1.43	+5.34	+2.75	+5.47	+5.90	+3.84

As the results in this section reveal, Illinois charter schools are performing at levels that are similar or slightly better than demographically similar schools. Over time, the Illinois charter schools have seen steady and noticeable improvement. These impressive results are likely due to the closure of poor performing schools, which lifts the aggregate of remaining schools. It is also important to point out that the fact that we could not include special education and limited English proficiency when we created the predicted values also is likely to overestimate the results of charter schools. Nonetheless, even if we could have created estimates with special education and limited English proficiency, it is very likely that the improvement or growth trend over time would be similar to what we observe in Figures 1 and 3, although the trend line likely would have been lowered by 2 and 3 residual points at each annual data point.

Notes and References

- ¹ Retrieved [March 5, 2007] from <http://www.uscharterschools.org/cs/sp/view/sp/10>.
- ² Retrieved [March 5, 2007] from <http://www.isbe.state.il.us/ils/>.
- ³ Retrieved [March 15, 2007] from http://www.edreform.com/_upload/ranking_chart.pdf.
- ⁴ Chi, W. C., & Welner, K. G. (in press). Charter ranking roulette: An analysis of reports that grade states' charter school laws. *American Journal of Education*.
- ⁵ Nelson, C., & Miron, G. (2002). *The evaluation of the Illinois charter school reform*. Kalamazoo: The Evaluation Center, Western Michigan University. [This report can be requested from the Illinois State Board of Education]
- ⁶ Hoxby, C., & Rockoff, J. (2004). *The impact of charter schools on student achievement*. Cambridge, MA: Taubman Center for State and Local Government, Kennedy School of Government, Harvard University.
- ⁷ U.S. Department of Education, Office of the Under Secretary. (2004). *Evaluation of the public charter schools program: Final report*. Washington, DC: Author. The report is available at <http://www.ed.gov/rschstat/eval/choice/pcsp-final/finalreport.doc>.
- ⁸ Chicago Public Schools. (2006). *Chicago public schools charter schools performance report 2004-2005*. Chicago: Author. Available at http://www.uscharterschools.org/cs/sp/view/uscs_rs/2207
- ⁹ Illinois State Board of Education. (2007). *Illinois charter school annual report, 2005-06*. Chicago: Author. Retrieved [March 7, 2007] from http://www.isbe.state.il.us/charter/pdf/charter_annual_07.pdf
- ¹⁰ The Web site for the Common Core of Data is <http://nces.ed.gov/ccd/>.
- ¹¹ Retrieved [February 25, 2007] from <http://www.isbe.state.il.us/research/Default.htm>.
- ¹² Illinois Learning Standards Web site: <http://www.isbe.state.il.us/ils/Default.htm>.
- ¹³ Information about the ISAT and PSAE available at <http://www.isbe.state.il.us/assessment/default.htm>. The assessment data we downloaded were retrieved [February 25, 2007] from http://www.isbe.state.il.us/research/htmls/report_card.html.
- ¹⁴ Retrieved [March 15, 2007] from http://www.schoolmatters.com/pdf/state_reports/SIL.pdf.