



P O L I C Y R E P O R T

Reassessing North Carolina's Charter Schools: A Note on Caroline Hoxby's Findings

CRAIG M. NEWMARK
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CRAIG M. NEWMARK
Associate Professor of Economics
North Carolina State University
craig_newmark@ncsu.edu

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Introduction

In response to a widely cited study by the American Federation of Teachers, Caroline Hoxby recently released a study of the academic proficiency of charter school students. Hoxby's conclusion is favorable to charter schools: she finds that compared to regular public schools, ". . . charter students are 5.2 percent more likely to be proficient in reading and 3.2 percent more likely to be proficient in math on their state's exams." (Hoxby, December 2004, p. 1).

In addition to this nationwide result Hoxby also reports results for 19 individual states and the District of Columbia. In all but one of these areas she finds that charter school students are either equally proficient, or more proficient, in reading than regular public school students. The only exception is North Carolina. In all but two of these areas she finds that charter school students are either equally proficient, or more proficient, in math than regular public school students. One of these two exceptions is North Carolina. Hoxby makes a point of

noting the apparently poor performance of North Carolina charter students: "North Carolina stands out as the only state in which charter students are statistically significantly less likely to be proficient in both reading and math. The North Carolina charter school disadvantage is 4 percent in both subjects." (Hoxby, December 2004, p. 14).

In this note I argue that Hoxby's procedure for assessing North Carolina charters is incomplete in two ways. Her procedure does not account for the higher fraction of students who are academically gifted in North Carolina regular public schools relative to North Carolina charter schools. And her sample of North Carolina charter schools includes 11 schools targeting at-risk students while her sample of North Carolina regular public schools does not include any. When I modify her method to account for these two facts, I find that the proficiency of North Carolina charter school students is not significantly different from their regular school counterparts.

Hoxby's Procedure

In Hoxby's procedure, as applied to North Carolina schools, she first identified each charter in the state serving fourth graders. For the 2002-03 school year, she found 65 such charter schools. For each of these charter schools Hoxby then selected a matching regular public school. The matching school was the regular public school serving fourth graders that was geographically closest to the charter. Non-regular public schools such as "alternative schools, schools for the disabled, schools that admit students based on examinations, and magnet schools to which a student must apply" were not permitted to be matching schools (Hoxby, September 2004, footnote 12).¹

For each charter school and its matching regular public school, Hoxby obtained data from the North Carolina

Department of Public Instruction on the percentage of students who tested as "proficient" in reading and mathematics, combined.² She computed the percentage proficient in the charter school minus percentage proficient in the matching regular public school. Last, she computed a weighted average of these differences over all the pairs of schools in the sample—where each weight was the number of fourth graders in the given charter school.³

Hoxby asserts that this matching procedure has important advantages. One in particular is that "Matched schools share a neighborhood; local economic conditions; and a population of parents and students with certain incomes, races, ethnicities, and family structures." (Hoxby, December 2004, p. 4).

Extending Hoxby's Analysis

On her website, <http://post.economics.harvard.edu/faculty/hoxby/papers.html>, Professor Hoxby kindly offers to make her data and computer program available to interested investigators. I obtained them. And using them I was able to reproduce, exactly, the results she reported for North Carolina. The weighted-average difference in proficiency of charter school students was 4.2 percentage points lower than the matched regular public school students, and this difference was statistically significant at the .05 level. This matches the results shown in Tables 2 and 3 of her September paper.

But recent work (Newmark, 2005) suggests that Hoxby's approach might be incomplete in two ways. At least in North Carolina, the percentage of regular public school students who are identified as academically gifted is higher than the percentage of charter schools students who are. For third through eighth graders in 2002-03, the percentages were 13.62 and 4.20 (Newmark, Table 4). I find similar percentages for the fourth-grade students in Hoxby's sample: 12.8 percent and 4.6 percent.⁴ Clearly, academically gifted students are more likely to be proficient in reading and math, other things equal, and a comparison of charter schools and regular public schools should control for the different percentages of gifted students who attend them.

Second, some charter schools target at-risk students and it's clear that comparing those schools to regular public schools biases the comparison against charter schools. She did not control for this in her first paper, but in her second recent paper, Hoxby acknowledges this (p. 12):

Charter schools for at-risk students seek out applicants with poor achievement, so they should not be criticized for having students whose achievement is low. Put another way, if a school deliberately seeks out low-performing students, there is little or no information to be gleaned by comparing its outcomes to those of its matched regular public school.

In her second paper Hoxby therefore excluded from the analysis charter schools she identified as targeting at-risk students. For North Carolina, she reports that the results changed hardly at all. Without the targeted charters, she reports (December 2004, p. 24) that the percentage of charter school students who were proficient was 4.3 percentage points less than regular public school students (compared to 4.2 percentage points originally).⁵

But I wonder whether her method for identifying at-risk charters was too restrictive. She describes her method

as follows (p. 39): "A school is classified as targeting at-risk students if its description in the *Charter School Directory 2004* says that its program is for students who are 'at-risk'; 'drop-outs'; 'delinquents'; or under the care of the state, the courts, or the juvenile detention system." I assume "*Charter School Directory 2004*" refers to the Center for Education Reform's *National Charter School Directory 2004*. That directory states a school "serves at-risk students" for three of the charters in Hoxby's data. For two other charters in the data, the phrase "at-risk" is not used but the schools should clearly be so classified: Grandfather Academy, which the directory states provides "[A] [s]pecial educational program for students estranged by abuse" and Healthy Start Academy Charter, which the directory states, "Targets students who often fail in traditional classrooms." I don't have the list of charters Hoxby identified, but based on this publication, it would seem that she identified no more than these five charters as targeting at-risk students. In my recent paper I identify an additional six charters in her data as targeting at-risk students: Ann Atwater Community, Crossnore Academy, East Wake Academy, East Winston Primary, Hope Elementary, and Sugar Creek Charter.⁶

In the table on the next page I show the results of modifying Hoxby's analysis to include the percentages of academically gifted students and to expand the identification of at-risk charters.

Equation 1 reproduces Hoxby's result: charter school students are less proficient than regular school students by 4.2 percentage points and the difference is statistically significant.

Equation 2 adds the variable DGifted that measures the percentage of fourth graders who are identified as academically gifted in the charter school minus the percentage who are identified as academically gifted in a given regular public school. As expected, DGifted is positive and statistically significant (at the .05 level): the more academically gifted children who attend the charter, the more proficient the charter's students tend to be.

Importantly, with the difference in giftedness controlled for, the difference between the percentage proficient at charter schools and regular public schools drops from

Clearly, academically gifted students are more likely to be proficient in reading and math, other things equal, and a comparison of charter schools and regular public schools should control for the different percentages of gifted students who attend them.

TABLE 1: HOXBY'S RESULT AND NEWMARK'S EXTENSIONS

	1	2	3	4	5
Charter	-4.21	-2.04	-2.40	-0.29	-2.49
	(-2.56)	(-1.12)	(-1.43)	(-0.16)	(-1.23)
DGifted		0.26		0.22	0.02
		(2.37)		(2.67)	(0.21)
At-Risk Charter			-12.68	-12.52	-6.32
			(-2.86)	(-2.94)	(-1.76)
DHSGrad					0.17
					(0.97)
DSomeafHS					0.12
					(0.57)
DTwoyr					0.14
					(0.82)
DTrade					0.04
					(0.16)
DFouryr					0.20
					(1.33)
DGrad					0.18
					(0.87)
DBeh					-0.35
					(-0.71)
DAmIF					0.93
					(0.60)
DAsM					0.49
					(0.46)
DAsF					0.91
					(0.82)
DHisM					0.87
					(0.94)
DHisF					0.84
					(0.91)
DBM					0.40
					(0.48)
DBF					0.47
					(0.54)
DWM					0.58
					(0.68)
DWF					0.71
					(0.85)
No. of obs.	63	63	63	63	63
Adjusted R-sq		0.07	0.12	0.17	0.50

T-statistics in parentheses. Equations estimated by OLS with observations weighted by the number of students in each charter.

4.2 percentage points to 2.0 percentage points and the difference is no longer statistically significant.

Equation 3 shows a qualitatively similar result from adding a zero-one variable that indicates whether a charter school is one of the 11 in the data that targets at-risk students. At-risk charters have fewer proficient students than their matched regular public schools, by 12.7 percentage points, and this difference is significant at the .01 level. But controlling for at-risk charters, the other charters' students are not significantly different from the regular public school students.

Equation 4 includes controls both for giftedness and for at-risk charters. The gap in performance between non-targeted charters and regular public schools is less than 7 percent of the amount that Hoxby reported, and with a t-ratio of just -0.16, this difference is not statistically significant at any reasonable level. For all practical purposes, the difference in academic proficiency between non-at-risk charter students and regular public school students is zero.

Finally, equation 5 shows the results of adding variables to control for gender, race, behavioral handicappedness, and parent education levels. DHSGrad, DSomeafHS, DTwoyr, DTrade, DFouryr, and DGrad all measure the difference between the percentage of charter school students whose parents achieved a given level of education and the percentage of regular public school students whose parents achieved that same level of education. DBeh measures the difference in percentage of students identified as behaviorally/emotionally handicapped. And

the remaining variables indicate the races and genders of the students: American Indian females, Asian males, Asian females, Hispanic males, Hispanic females, Black males, Black females, White males, and White females (the omitted category is American Indian males).⁷ The effects of all these additional variables on academic proficiency are measured imprecisely, with large standard errors. This is due in part to Hoxby's matching procedure: the charter school students and the matched regular public school students are substantially similar in gender, behavioral handicappedness, and race.

Including these other variables reduces the measured impact of giftedness and at-risk charters, especially giftedness. But the bottom line is that, even with all these other variables included, the difference between non-at-risk charter students and regular public school students is only about half the size of the difference Hoxby reported and the difference is not statistically significant, not even at the .20 level.

Importantly, with the difference in giftedness controlled for, the difference between the percentage proficient at charter schools and regular public schools drops from 4.2 percentage points to 2.0 percentage points and the difference is no longer statistically significant.

Conclusion

Controlling for giftedness and at-risk charters, the difference in the academic performance between charter school students and regular public school students is approximately zero.

That said, the academic performance of North Carolina's charters still ranks in the bottom half of the states Hoxby examined. And that's before adjusting the results of the other states for giftedness and at-risk charters.⁸

But Hoxby finds a number of factors that help explain differences across the states. One is the age of charter schools. In states such as Arizona and California, a number of charter schools are older than the oldest North

Carolina charters, and Hoxby finds that charter schools' academic performance rises with school age. Other factors contributing to state performance differences are the nature of the charter school laws and the characteristics of the charters school students. (Hoxby argues that charters are especially effective in raising the achievement of poor students – North Carolina might well have as high a percentage of poor students as other states – and Hispanic students – North Carolina probably does not have as high a proportion of Hispanic students as many other states.) What explains the differences across states in the relative academic performance of charter schools is a topic meriting further research.

Notes on Data

¹ Hoxby also considered an alternate way to select matching schools. If there was a regular public school that was no more than 5 percent or 0.5 miles further away—whichever was larger—from the geographically closest regular public school but whose racial composition more closely matched the charter school's, she selected that school as the matching school. Hoxby's results using this alternate technique were almost identical for North Carolina: using the first technique she finds charter students to be 4.2 percent less proficient than matching public school students; using the alternative technique she finds charter school students to be 4.1 percent less proficient (Hoxby, September 2004, Tables 2 and 3). This note uses the regular public schools selected by the first technique.

² Hoxby's papers show separate results for reading and for math. But she informed me by e-mail (December 13, 2004) that DPI did not provide her with separate proficiency scores for North Carolina. DPI reported a "combined math and reading score" to her; she acknowledged that her papers should have noted this.

³ Hoxby's empirical results are apparently based on two less than the full number of school pairs because for two charters, Arts Based Elementary in Winston-Salem and New Dimensions School in Morganton, she did not obtain the data needed to compute the weights.

⁴ Data on the giftedness of North Carolina students is gathered by the state Department of Public Instruction and is available through the North Carolina Education Research

Center. Information about fourth graders during the 2002-03 school year is in the file titled EOG4PUB03.sas7bdat, in a variable labeled EXCEPT.

⁵ Hoxby also excluded two schools that targeted "gifted students."

⁶ See the Data Appendix of Newmark (2005) for some detail on how I identified these schools. Both Hoxby's method of identifying these schools and my method should be considered crude and tentative. Classifying an individual student as "at-risk" is inherently subjective; the intensity with which a given school "targets" such students is probably even more so. And the analysis would be especially distorted if charters tried to excuse the poor performance of their students ex post by spuriously claiming that they were targeting at-risk students. As a result, the results I present that include a variable for at-risk charters should be viewed cautiously.

⁷ Data on these additional variables were also obtained from the North Carolina Educational Research Center.

⁸ I don't know if the sizeable difference found in North Carolina in the percentages of students who are academically gifted who attend charters and regular public schools also is present in other states. The only bit of evidence I have on that is from Sass's (2004) recent paper. He reports (p. 31) that for Florida the difference is much smaller: 4.18 percent of charter school students were identified gifted and 5.58 percent of regular school students were identified gifted.

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About the Author

Craig M. Newmark is Associate Professor of Economics at North Carolina State University. He has a B.A. from George Washington University and a Ph.D. from U.C.L.A. His research has focused on American antitrust policy. Dr. Newmark has been invited to speak to economists at the U. S. Department of Justice and the Federal Trade Commission. He has published in leading economics journals, including the *Journal of Political Economy*, the *Journal of Law and Economics*, and the *Review of Economics and Statistics*. Dr. Newmark has taught a wide variety of courses that includes Managerial Economics, Introduction to Economic Research, Economics of Information Goods, Industrial Organization, and Politics and Markets, and he has been consultant to a number of organizations, including the American Petroleum Institute and the North Carolina Health Products Manufacturers Association. He and his wife, Betsy, a teacher at Raleigh Charter High School, live in Raleigh. They have two daughters.

About the John Locke Foundation

The John Locke Foundation is a nonprofit, nonpartisan public policy institute based in Raleigh. Its mission is to develop and promote solutions to North Carolina's most critical challenges. The Locke Foundation seeks to transform state and local government through the principles of competition, innovation, personal freedom, and personal responsibility in order to strike a better balance between the public sector and private institutions of family, faith, community, and enterprise.

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*“To prejudge other men’s notions
before we have looked into them
is not to show their darkness
but to put out our own eyes.”*

JOHN LOCKE (1632–1704)

Author, *Two Treatises of Government* and
Fundamental Constitutions of Carolina