THE EFFECTS OF CHARTER SCHOOLS ON DISCIPLINARY INFRACTIONS IN TRADITIONAL PUBLIC SCHOOLS: EVIDENCE FROM ARKANSAS

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ABSTRACT

Charter school enrollment is increasing across the United States. One unexplored question is the effect charter schools have on student behavior in traditional public schools. Our study focuses on Arkansas, where we have access to data on charter school enrollment by school district. A two-way fixed-effects analysis finds that an increase in charter school enrollment is associated with fewer disciplinary infractions in traditional public schools. School districts with increased charter competition experience an increase in the percentage of gifted and talented students. We also find no relationship between charter enrollment and the percentage of African-American students in traditional public schools, which contradicts a common critique that charter schools are causing segregation.

Keywords: Charter Schools, School Choice, Disciplinary Infractions

INTRODUCTION

Public charter schools' popularity has increased in the U.S. The number of public charter schools has increased from 2,000 to 7,000 since the year 2000, and enrollment has increased from 0.4 million to 3 million students (Public Charter School Enrollment). Charters are taxpayer-funded like traditional public schools, but they offer greater flexibility. They can have different learning environments, school schedules, procedures, and curriculums. Supporters claim that school choice creates a more innovative environment. Others argue that the charter schools harm traditional public schools by competing for resources. Our research focuses on one relatively unexplored impact: how increased charter school enrollment affects the number of disciplinary infractions committed by students at traditional public schools.

Economists tend to view competition favorably. A successful new restaurant puts pressure on existing restaurants to innovate or shut down. The winner of the competition is the consumer. Competition provides a low price for a quality meal. The same situation occurs in the market for cell phones, computers, cars, etc. The quality of K-12 education has not made great progress over the years relative to other sectors of the economy. 12th graders have not significantly improved their test scores since the 1990s. For instance, the ACT score of 20.8 in 2018 is lower than the average score of 21.0 twenty years earlier (ACT Profile Report - National). K-12 education is also a field that has relatively little competition.

Unlike the choice a consumer has for a cell phone, a student has few choices for K-12 education. Public schools do not charge tuition. Some private schools exist, but it is difficult for them to compete against a seller that charges a price of zero. The first public charter school opened in 1992 in Minnesota (Evaluation of the Public Charter Schools Program, 2004). Students can attend public charter schools without cost. If the traditional public schools provide a poor service, students can enroll in the charter school if available. Charter schools can put pressure on traditional public schools to innovate or shut down.

An argument against the charter schools is the effect they have on traditional public schools. Opponents argue that charters take tax money away from traditional public schools. Valerie Strauss (2017) persistently writes Washington Post articles outlining examples of traditional public schools losing money to charter schools. A traditional public school that lacks funds can be less equipped to provide a quality education. One can also note that charters are less equipped to provide a quality education if the traditional public school takes money away from them.

Our study focuses on the effect charter schools have on disciplinary infractions in traditional public schools. A study by the Bill and Melinda Gates Foundation (2012) surveyed teachers and found classroom behavior to be of high concern. More than 70% of teachers in the survey said that they are not equipped to deal with behavioral issues. That percentage of teachers is higher than with any other question about classroom problems. Teachers will tell you that behavior is a major problem, and evidence shows that academic performance suffers from it (Cortes, Moussa, & Weinstein, 2012; Kremer, Flower, Huang, & Vaughn, 2016).

This study examines data from Arkansas's school districts. Arkansas has been expanding its number of charter schools and has data available on district-wide enrollment. We use this data to determine if there is a relationship between the number of disciplinary infractions in a district and the number of students enrolled in a charter school from that district. Economic reasoning suggests the relationship can go either way. Charters can be enrolling the high-achieving students and leaving the traditional public schools with fewer resources to deal with disciplinary infractions. Conversely, charters can offer an alternative for students who have disciplinary problems in traditional public schools. The evidence we provide supports the latter possibility. We find a negative relationship between charter school enrollment and disciplinary infractions in school districts.

Our evidence suggest that charters are enrolling a disproportionately high number of low-achieving students. We find that charter enrollment leads to a greater percentage of gifted in talented students in the school district. Existing literature finds that the low-achieving students in Arkansas do better in charters than traditional public schools (Ritter, Wolf, Anderson, Foreman, Rhinesmith, & Swanson, 2016). Combined with our finding, charters appear to be beneficial to students in both types of schools.

LITERATURE ON CHARTER SCHOOLS' EFFECTS ON TRADITIONAL PUBLIC SCHOOLS

Studies on the effects of charters on traditional public schools have yielded mostly positive, but some mixed results. Competition in the market can influence a firm so that it improves or be forced

to shut down. Two studies focused on North Carolina schools. Holmes, Desimone, and Rupp (2006) found that students in traditional public schools performed better when students had a chance to go to a nearby charter school. The authors discovered that result even though charter schools were enrolling above-average performers. Bifulco and Ladd (2006) conducted a similar study in North Carolina but found inconclusive effects of charter schools on traditional public school performance.

Most studies in other locations found that charters had a positive effect on traditional public schools. A study by Winters (2012) revealed higher reading test scores in New York City's traditional public schools when a higher percentage of students enrolled in a charter school. Both math and reading scores increased for the lowest-performing students under greater charter-school competition. Booker, et al. (2008) found higher test scores for traditional public school students in Texas when there was an increase in charter school enrollment. Cebula, Hall, and Tackett (2016) established a positive relationship between public school test scores and non-public school enrollment in West Virginia. Linick (2016) discovered that traditional public schools in Ohio changed their resource allocation under the competitive pressure of charter schools. Kalulu, Snyder and Ouattara (2017) studied elementary schools in Arkansas and found a positive relationship between charter school competition and public school test scores in math, reading, and language.

Nationwide studies have discovered either positive or inconclusive effects of school choice on traditional public schools. Hoxby (2003) found that cities with more school choice had higher math and reading scores. Davis (2013) used a national longitudinal dataset and found no strong relationship between charter school enrollment and traditional public school performance.

Relatively few studies consider the effects charter schools have on disciplinary infractions in traditional public schools. One such study by Imberman (2011) examined how charter enrollment affected infractions based on geographic distance within a large southwestern city. His results indicated that a 10 percentage-point increase in charter schools' share of students reduces disciplinary infractions by 45 infractions per 100 students. A study by Cordes (2017) discovered that nearby charter schools reduce grade retention and attendance in traditional public schools. Her study also revealed that parents found the school significantly safer and teachers said that academic expectations, respect, and cleanliness of the students increased with charter school competition.

Our study contributes to the literature by examining student behavior in Arkansas's school districts. No published study to our knowledge has examined the effects of charter schools on student behavior in traditional public schools in Arkansas. A few studies have looked at the effectiveness of charter schools. Ritter, et al. (2016) found that Arkansas students enrolled in open charter schools performed better in math benchmark exams (grades 3 through 8) than similar students enrolled in a traditional public school. A study on how charters affect student achievement by Mills (2013) found that charters have negative performance impacts on average; however, poor performance typically diminishes as schools mature. This may be evidence of a functioning market – bad charter schools are closing, while good ones are persisting. A parent satisfaction survey in fall 2015 by Ritter et al. (2016) found that most parents of students in open charter schools indicated many areas that were stronger in the charter school than their prior school, including "1. What is taught in school; 2. Amount child has learned; 3. Teacher performance; 4. Student

engagement; 5. School communication about academics and discipline; 6. Discipline in school; 7. Principal performance; and 8. Parental involvement."

The positive performance of charter schools in Arkansas can be offsetting if they are causing harm to students in traditional public schools. One can argue that charters do not accept the challenging students and leave them to the traditional public schools. Ritter, et al. (2016) did not find that to be the case. They found charters in Arkansas enroll a significant higher percentage of minority students who disproportionally achieve lower scores. We then hypothesize in our study that disciplinary infractions would decrease in traditional public schools if more students are going to charter schools. Given the struggle teachers have with classroom behavior, this result has important implications on student performance.

DATA AND METHODS

Our data is at the Arkansas school district level for three school years: 2014-2015, 2015-2016, and 2016-2017. We collected our data from the Arkansas Department of Education, the University of Arkansas's Office of Education Policy, and the National Center for Education Statistics. The main dependent variable of interest is the nondrug disciplinary infractions. These infractions include insubordination, disorderly conduct, fighting, etc. Our study investigates whether incidents of misbehavior increased or decreased in the traditional public schools as more students entered charter schools. The disciplinary infractions are per 100 students.

Our main independent variable is charter school competition. We obtained charter school enrollment from each district from the Arkansas Department of Education. We used the total enrollment in each district to calculate the percentage of students in the district that went to a charter school. The more charter enrollment, the more competition facing the traditional public school. We controlled for demographic variables, including the percentage of the Black, Hispanic, free-and-reduced lunch, gifted-and-talented, and male students. We also considered the student-teacher ratio, instructional spending per pupil, and total enrollment. Charter school enrollment can affect disciplinary infractions through its effect on enrollment, so we do not control for the student-teacher ratio and total enrollment in all specifications. The appendix provides a description and the source of the data.

After testing the relationship between charter school enrollment and disciplinary actions, we also wanted to address the possibility of demographic changes from charter school enrollment. One critique of finding fewer disciplinary actions in traditional public schools is that schools are simply segegrating and dumping the low-achieving students in other schools. Of course, charter enrollment is a choice for students, and the demand for seats sometimes exceed the supply. Some of these students may be from disadvantaged families. We considered the effect of charter school enrollment on the percentage of gifted and talented enrollment in traditional public schools. We also investigated the possibility of segregations by examining the relationship between African-American students and charter school enrollment.

We use a fixed-effects model with yearly time effects. We use this model so we can control for time-invariant factors in the school districts that may influence disciplinary infractions besides charter enrollment. Controlling for total enrollment and time effects help reduce, though at a cost,

the possibility of simultaneous endogeneity problems. Charter school enrollment and disciplinary infractions may move together because of changing total enrollment. However, charter school enrollment may affect disciplinary infractions through enrollment because it may reduce class size, which means controlling for total enrollment may understate the effects of charter enrollment on disciplinary infractions. We run both models.

RESULTS

Table 1 displays the summary statistics. Table 2 displays the fixed-effects estimates. We display three specifications. Each model displays a negative and statistically-significant coefficient on the charter school enrollment variable. An increase in charter school enrollment results in fewer disciplinary infractions with or without controlling for other factors. Model 3 estimates that a one percentage-point increase in charter school enrollment as a fraction of total enrollment leads to 4.9 fewer disciplinary infractions per 100 students in the school district.

Table 1. Summary Statistics. Panel Data for Arkansas School Districts.
School years 2014-2015, 2015-2016, and 2016-2017.

Variable	Obs	Mean	Std. Dev.	Min	Max
Disciplinary Infractions	660	1.28	1.08	0	7.81
Charter Enrollment	662	1.13	3.98	0	51.02
Black	662	15.77	24.32	0	98.51
Hispanic	662	7.49	9.47	0	61.74
Gifted and Talented	662	9.65	3.15	3.31	25.46
Male	662	51.50	1.69	45.05	58.03
Instructional Spending	658	5825.57	710.71	4567.74	11941.65
Student-Teacher Ratio	660	11.99	11.24	4.83	292
Total Enrollment	662	2066.61	3121.51	318	23363

Table 2. Disciplinary Infractions and Charter School Enrollment. Fixed-effect regressions.
Dependent variable: nondrug disciplinary infractions per 100 students
in an Arkansas school district.

Variable	Infractions	Infractions	Infractions
Charter Enrollment	-5.39***	-5.50***	-4.90**
	1.44	*1.71*	*2.33*
Black		3.71**	3.82**
		1.81	*1.85*
Hispanic		0.21	-0.06

		2.14	*2.15*
Free Lunch		-0.22	-0.21
		0.16	*0.17*
Gifted and Talented		0.94	1.08
		1.21	*1.24*
Male		-2.32	-2.24
		1.60	*1.56*
Instructional Spending			-0.0022
			0.0054
Student-Teacher Ratio			-0.0020
			0.0091
Total Enrollment			0.0046
			0.0031
Constant	66.25***	131.27	128.44
	1.77	*98.91*	*11.76*
2015	4.52***	5.05***	4.81***
	1.68	*1.80*	*1.87*
2016	6.33***	7.26***	7.49***
	2.14	*2.48*	*2.95*
N	660	660	653
F	6.93	4.33	8.74

*Robust Standard Errors are in italics. *** 1% significance level, ** 5% significance level, * 10% significance level.*

Model 1 only controls for the year effects. Model 2 controls for the demographic variables. Model 3 includes the student-teacher ratio. We calculate this ratio as the number of students per certified teacher. A student-teacher ratio may be a channel through which charter school enrollment affects disciplinary infractions, so we do not include it in all models. More teachers can theoretically lead to lower infractions because the teacher has more time per student to monitor behavior. The regression results indicate no statistical relationship between the student-teacher ratio and disciplinary infractions. The third model also includes total enrollment and instructional spending. A high enrollment could lead to more opportunity for disciplinary infractions. Including this variable may also be inappropriate because it can be a channel through which charter enrollment affects disciplinary infractions. We see that the coefficient on charter enrollment is smaller when we control for total enrollment. The coefficient on the total enrollment is positive but not statistically significant.

Another variable that has a statistically-significant coefficient is the percentage of black students in the school district. School districts that experience an increase in the number of black students have an increase in disciplinary infractions on average. This result is robust over all specifications, including when we control for poverty (free and reduced lunch).

The negative relationship between charter school enrollment and disciplinary actions provides evidence to support the idea that competition changes the way traditional public schools operate. One critique of our result can be that it is possible charter schools are changing the demographics, not improving behavior. Table 2 isolates the effect of charter competition on disciplinary actions from demographic changes because it controls for gender, race, and the high-achieving students. However, it is still possible that charter schools are taking away the low-achieving or high-achieving students. To investigate this possibility, table 3 examines the relationship between gifted and talented students and charter enrollment, and table 4 examines the relationship between the percentage of Black students and Hispanic students and charter enrollment.

Table 3 displays three fixed-effects specifications to see if a change in charter school enrollment affects the percentage of gifted and talented students in a school district. Gifted and talented programs allows the high-performing students to participate in a more accelerated or enriching curriculum, such as advanced-placement classes. These regressions allows us to see who is leaving the traditional public schools. All three models demonstrate a positive and statistically-significant relationship between charter enrollment and the percentage of gifted and talented students in traditional public schools. With and without controlling for demographics and school district characteristics, when more students leave a district to attend a charter school, the traditional public schools experience an increase in their percentage of gifted and talented students. For instance, model 3 predicts that an increase in charter school enrollment of 10 percentage points as a percent of total enrollment will increase the number of gifted in talented students by 1.85 students per 100 students. The relationship and statistical significance holds with and without controlling for other demographic variables and school characteristics. Note that in table 2, charter school enrollment predicts disciplinary actions with or without controlling for the number of gifted and talented students. Since model 3 in table 3 controls for enrollment, the result may indicate that a few students in traditional public schools perform better when there is charter school competition.

Table 3. Gifted and Talented Students and Charter School Enrollment. Fixed-effect regressions. Dependent variable: the percentage of students enrolled in a gifted and talented program in an Arkansas school district.

Variable	Gifted	Gifted	Gifted
Charter Enrollment	0.16***	0.14**	0.19**
	0.061	*0.064*	*0.077*
Black		-0.10*	-0.11*
		0.057	*0.057*
Hispanic		0.28***	0.28
		0.084	*0.082*
Free Lunch		-0.00085	-0.0043
		0.0073	*0.0071*

Male		-0.0051	-0.011
		0.062	0.062
Instructional Spending			0.00045**
			0.00019
Student-Teacher Ratio			0.00070
			0.00043
Total Enrollment			0.000069
			0.00014
Constant	9.64***	*9.55***	7.41*
	0.07	*3.72*	*4.06*
2015	-0.19***	-0.25***	-0.28***
	0.076	*0.079*	*0.080*
2016	-0.31***	-0.43***	-0.52***
	0.10	*0.11*	*0.12*
N	662	662	655
F	4.00	3.79	5.39

*Robust Standard Errors are in italics. *** 1% significance level, ** 5% significance level, * 10% significance level.*

Another possible critique of charter schools is that they are discriminating based on race. Table 4 examines the relationship between a change in charter enrollment and a change in the percentage of Black or Hispanic students in the school district. The regressions find no clear relationship. The coefficient on charter enrollment is slightly positive but not statistically significant. The evidence in table 4 provides no evidence that the charter schools are discriminating based on race.

Table 4. Race and Charter School Competition.
Two-way panel regressions at the district level for 2014-2016.
Dependent variable: percentage of students that identify as black in the Arkansas district level.

Variable	Black	Hispanic
Charter Enrollment	0.0027	0.0151
	0.13	*0.0459*
Gifted and Talented	-0.072*	0.13***
	0.041	*0.048*
Free Lunch	-0.0062	0.011
	0.0059	*0.0078*
Male	-0.083*	-0.016
	0.048	*0.043*

Instructional Spending	0.000088	-0.000026
	0.00019	*0.00012*
Student-Teacher Ratio	0.00043	-0.00040**
	0.00042	*0.00021*
Total Enrollment	0.00035*	-0.00010
	0.00018	*0.00008*
Constant	19.74***	*6.47****
	2.81	*2.45*
2015	0.061	0.23***
	0.082	*0.054*
2016	0.032	0.50***
	0.11	*0.084*
N	655	655
F	4.82	12.01

*Robust Standard Errors are in italics. *** 1% significance level, ** 5% significance level, * 10% significance level.*

To address endogeneity concerns, other regressions were run (not shown) to see if lagged charter enrollment is associated with disciplinary infractions. The relationship holds, but those regressions force us to eliminate a year of observations. We did not use instrumental variables, such as geographic distance, because those are time-invariant, and they will not be appropriate in our fixed-effects model. We see no rationale for reverse-causality, where fewer disciplinary infractions in public schools cause more students to leave the traditional public schools. If fewer disciplinary infractions caused fewer students to leave the traditional public schools, which seems more plausible, then our result is stronger.

DISCUSSION

Charter schools provide an alternative to traditional public schools. Enrollment in charter schools has the potential to steer resources from the traditional public schools. Teachers have argued that they do not have enough resources to deal with classroom behavioral issues. Our study examines whether classroom behavior improves or declines when charter school enrollment changes. We find that disciplinary infractions decline in school districts that experience an increase in charter school enrollment. Less effort and fewer resources devoted to school discipline in traditional public schools means the teachers can use more effort and resources for teaching. Some students struggling in traditional public schools may find charters to be a better fit.

In Arkansas, charter enrollment appears to be a win-win for students in both types of schools. Existing Arkansas studies have shown that students perform well in charter schools compared to traditional public schools, and that student performance improves under competition. Our study shows that charter schools also reduces the disciplinary infractions at traditional public schools.

Teachers have listed classroom behavior as a major obstacle. Charter schools can provide alternative approaches and competition that can benefit traditional public schools. State and local governments can look to charter schools to help alleviate the disciplinary issues in the traditional public schools and improve student performance.

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APPENDIX

Key. All data are at the school district level and for years 2014-2015, 2015-2016, and 2016-2017.

Variable	Description	Source
Disciplinary Infractions	The number of nondrug disciplinary infractions in a school district per 100 students.	Data is from the Arkansas Department of Education. Retrieved from https://adedata.arkansas.gov/statewide/
Charter Enrollment	The percentage of students in the school district that went to a charter school.	Data requested from the Arkansas Department of Education.
Black	The percentage of students in the school district that identify as black.	Data is from the Office for Education Policy, University of Arkansas. Data retrieved from http://www.officeforeducationpolicy.org
Hispanic	The percentage of students in the school district that identify as Hispanic.	Data is from the Office for Education Policy, University of Arkansas. Data retrieved from http://www.officeforeducationpolicy.org
Gifted and Talented	The percentage of students in the school district that are in gifted and talented programs.	Data is from the Office for Education Policy, University of Arkansas. Data retrieved from http://www.officeforeducationpolicy.org
Male	The percentage of students in the school district that identify as male.	Data is from the Arkansas Department of Education. Retrieved from https://adedata.arkansas.gov/statewide/
Instructional Spending	Dollars per pupil spent on instruction in the school district.	Data is from the Office for Education Policy, University of Arkansas. Data retrieved from http://www.officeforeducationpolicy.org
Student-Teacher Ratio	The number of students per certified teacher.	Data is from the Arkansas Department of Education. Retrieved from https://adedata.arkansas.gov/statewide/
Total Enrollment	Total enrollment in the school district.	Data is from the Office for Education Policy, University of Arkansas. Data retrieved from http://www.officeforeducationpolicy.org

The entire dataset is available at the Figshare DOI identifier: 10.6084/m9.figshare.6328958

QRBD

QUARTERLY REVIEW OF BUSINESS DISCIPLINES

November 2019

Volume 6
Number 3

A JOURNAL OF INTERNATIONAL ACADEMY OF BUSINESS DISCIPLINES
SPONSORED BY UNIVERSITY OF NORTH FLORIDA
ISSN 2334-0169 (print)
ISSN 2329-5163 (online)