



Charter School Competition, Organization, and Achievement in Traditional Public Schools

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Citation: Davis, T. (2013). Charter School Competition, Organization, and Achievement in Traditional Public Schools. *Education Policy Analysis Archives*, 21(88) Retrieved [date], from <http://epaa.asu.edu/ojs/article/view/1279>

Abstract: Market models of education reform predict that the growth of charter schools will infuse competition into the public school sector, forcing traditional public schools to improve the practices they engage in to educate students. Some scholars have criticized these models, arguing that competition from charter schools is unlikely to produce significant change among public schools. Using data from the Early Childhood Longitudinal Study – Kindergarten Class, I attempt to identify potential mechanisms linking charter competition to achievement in traditional public schools. The results provide little support for the market model. Competition from charter schools is not associated with reading or math scores, and is only associated with three of ten organizational measures. There is some support for an indirect relationship between math achievement and competition through reductions in teacher absenteeism, but these results fall short of meeting conventional thresholds for statistical significance.

Keywords: charter schools; competition; school organization; achievement.

Competencia con Escuelas Charter, organización, y logro académico de escuelas públicas tradicionales

Resumen: Los modelos de reforma de la educación basados en el mercado predicen que el crecimiento de las escuelas charter estimularía competencia con el sector de enseñanza pública, obligando a las escuelas públicas tradicionales a mejorar las prácticas educativas con sus estudiantes. Algunos investigadores han criticado estos modelos, con el argumento de que la competencia de las escuelas charter es poco probable que produzca un cambio significativo en las escuelas públicas. Usando datos del Estudio Longitudinal de la Primera Infancia, intentamos identificar los mecanismos que unirían la competencia con escuelas charter a los logros en las escuelas públicas tradicionales (la organización escolar). Los resultados proporcionan poco sustento para el modelo de mercado. La competencia con las escuelas charter no se asocia con mejoras en los logros en lectura o matemáticas, y se asocia únicamente con tres de cada diez medidas de organización. Los resultados indican una relación indirecta entre el rendimiento en matemáticas y la competencia a través de la reducción de ausentismo de los docentes, pero los resultados no cumplen con los mínimos convencionales de significación estadística.

Palabras clave: escuelas charter; competencia; organización escolar; rendimiento académico.

Concorrência com escolas Charter, organização e desempenho acadêmico de escolas públicas tradicionais

Resumo: Os modelos de reforma da educação baseados no mercado prevêem que o crescimento das escolas charter estimularia a concorrência com o setor de educação pública, obrigando as escolas públicas tradicionais a melhorar as práticas educativas com os alunos. Alguns pesquisadores têm criticado estes modelos, argumentando que a concorrência de escolas charter não é susceptível de produzir uma mudança significativa nas escolas públicas. Usando dados do Estudo Longitudinal da Primeira Infância, tente identificar os mecanismos que ligam a competição com escolas charter a melhoras pedagógicas nas escolas públicas tradicionais (organização escolar). Os resultados dão pouco apoio para o modelo de mercado. Competição com escolas charter não estão associadas com melhorias no desempenho em leitura ou matemática, e estão associada com apenas três de cada dez medidas de organização. Os resultados indicam uma relação indireta entre logros em matemática e competição associadas a redução do absenteísmo dos professores, mas os resultados não atendem o padrão mínimo de significância estatística.

Palavras-chave: escolas charter; concorrência; organização escolar; rendimento académico.

Introduction

Proponents of market models of education assert that providing families with the power to choose schools will significantly improve the American educational system (Chubb & Moe 1990; Finn et al., 2000; Friedman, 1962; Hess, 2004; Hoxby, 2002, 2003; Nathan, 1996). The market model of education is built on two primary premises: first, allowing families to choose schools rather than subjecting them to a strictly enforced school assignment plan will create a variety of schools that will better meet the needs and wants of families and second, choice will generate *competition* among schools that will maximize student achievement (Chubb & Moe, 1988, 1990; Finn et al., 2000; Friedman, 1962; Hess, 2004; Hoxby, 2003; Nathan, 1996). Neoclassical economic models contend that organizations engage in a variety of different behaviors to deal with competition, including increasing output, efficiency, innovation, etc. (Clark, 1961; Hirschman, 1970). Along these lines, a major *assumption* underlying current market reform in education is that competition will force poorly performing schools to better *organize*, or improve their academic practices and internal operations,

which will in turn lead to higher student achievement (Betts, 2009; Chubb & Moe, 1990; Hoxby, 2002, 2003; Nathan, 1996). However, sociologists, among others, have criticized these models, arguing that choice and market reform do little to enhance achievement or ameliorate educational inequality (Fuller, 2002; Lubienski, 2005; Mickelson, 2005; UCLA, 1998; Wells, 2002).

Despite these critiques, reform in the shape of public school choice has gained significant favor in education policy initiatives across the country at various levels of governance (local, state, and federal) (Hess et al., 2001; Mickelson, 2005; Nathan, 1996; UCLA, 1998; Wells, 2002; Zimmer, et al., 2003). Charters schools are part of this reform. Charter schools represent a unique form of competition for traditional public schools, whose primary challenges until now have been choice in the form of residential mobility and private schooling. Charter schools are publicly funded schools that exist semi-independent from the control of local and state school authorities. Charter schools are public schools, and since they do not charge tuition like private schools, often compete with traditional public schools for a similar set of students. At least one argument cited by advocates of charter schools is that charter schools provide benefits to students who stay in traditional public schools because competition will compel traditional public schools to better meet the needs of students who remain in them. This is a common line of reasoning used by advocates of market reform, yet there have been few direct tests of this assertion (Teske et al., 2000; Zimmer & Buddin 2007, 2009).

Although several studies have examined whether competition from charter schools improves the achievement of traditional public school students, (Bifulco & Ladd, 2006; Booker et al., 2008; Hoxby, 2002, 2003; Sass, 2006), less research has focused on *how* schools respond to charter competition (Betts, 2009; Hess et al., 2001; Rofes, 1998; RPP International, 2001; Teske et al., 2000). More specifically, these studies have not examined which specific practices within traditional public schools are related to competition. Moreover, the few studies that address this process fail to link these responses to achievement (Arsen & Ni, 2011; Cannata, 2011; Hess et al., 2001; Hoxby, 2002; Rofes, 1998; RPP International, 2001; Teske et al., 2000). Studying this effect is akin to “unpacking the black box” of school choice and charter competition (Hess & Loveless, 2005; Zimmer & Buddin, 2007).

This paper attempts to fill that gap. Here I examine whether charter competition is associated with the inner workings of traditional public schools and in turn, the achievement of students in those schools. I use a nationally representative sample of students to address three principal research questions: a) To what extent is competition from charter schools associated with student achievement in traditional public schools? b) To what extent is competition from charter schools associated with the organization of traditional public schools? c) Does school organization mediate the relationship between competition and achievement? That is, are the practices associated with charter competition also associated with achievement? I examine the effect of distance to the single nearest charter on reading and math achievement as well as ten teacher and administrator reported school organization variables. I find limited support for the notion that charter competition influences either school organization or student achievement in traditional public schools.

The literature review is organized in the following manner. First, I present the theoretical argument and empirical predictions made by the market model of education reform to explain how competition from charter schools might compel changes among traditional public schools. Then I examine how the organization of charter schools is thought to differ from the organization of traditional public schools, and conversely, why charter competition may not lead to increased organization or achievement among traditional public schools. Finally, I review the findings of empirical studies testing the impact of charter competition on achievement and school organization. There is one important issue of note: the causal language used here to describe the market model reflects the predictions made by the theory and does not extend to my data or the inferences I draw.

Due to data limitations, I am unable to estimate any causal effects of charter competition. Consequently, this paper represents an exploratory examination of the relationship between charter school competition and the organization of traditional public schools and the performance of students in those schools.

Competitive Pressures and Traditional Public School Reform: Theoretical Predictions

Charter schools represent a unique form of competition for traditional public schools. Charter schools are one of the fastest growing segments of schooling in the U.S. Although they were non-existent prior to 1990, by 2009 charter schools were open in 40 states and the District of Columbia and enrolled approximately 2% of all public school students (Center for Education Reform 2009). Charters are still considered public schools since they are publicly financed, though charters do not typically receive the same per pupil expenditures as traditional public schools (Center for Education Reform, 2009; Cookson & Berger, 2002; Finn et al., 2005; UCLA, 1998). However, they are distinct in that they retain a level of autonomy and independent control not shared by traditional public schools.

In addition to market orientations, the charter school movement originated from a number of different and sometimes disparate perspectives and themes, including the community schooling movement, school decentralization movement, the standards and accountability movement, and an interest among teachers and school administrators for more autonomy and innovation (Buckley & Schneider, 2007; Fuller, 2002; Wells, 2002). Despite the contrasting motives compelling their interest in charter schools, the various branches of the charter school movement share an underlying assumption of the market orientation: high performance among charter schools will stimulate widespread improvement among traditional public schools, forcing poorly performing ones to adjust to enhanced expectations (Buckley & Schneider, 2007; Cookson & Berger, 2002). A report from the Department of Education's Office of Innovation and Improvement captures the idea that charter schools will encourage widespread improvement among all public schools:

By allowing citizens to start new public schools with this kind of autonomy, making them available tuition-free to any student, and holding them accountable for results and family satisfaction, proponents hope that this new mix of choice and accountability will not only provide students stronger learning programs than local alternatives, but will also stimulate improvement of the existing public education system (2004, 1).

In theory, the competitive pressure generated by charter schools is meaningful to traditional public school organization because a major motivation of the charter school movement focuses on improving upon and oftentimes deviating from the traditional practices and programs utilized by regular public schools to educate students. Since market logic *presumes* that charter schools are more effective than traditional public schools, market logic also predicts that regular public schools will step up their efforts and move towards engaging in similar practices as charter schools in an attempt to compete. Indeed, embedded in the market model of education is the assumption that competition leads to institutional isomorphism among service providers in the educational marketplace and would compel traditional public schools to mimic charters or similar models of education reform that are believed to be more effective. Institutional isomorphism is a common argument used to explain why the behavior of formal organizations tends to be similar across firms.

The concept, taken from institutional theory in sociology, in part argues that firms copy the behavior of successful existing organizations for at least three reasons: a) as a response to competition b) as means of establishing legitimacy in a new field or c) as a response to uncertainty or coercive pressure from other organizations upon which they depend (Meyer & Rowan, 1977; DiMaggio & Powell, 1983; Lubienski, 2003). In this scenario, all three reasons suggest that traditional public schools

would mimic the behavior of charters. As competitors, charters schools threaten to take the clientele of traditional public schools, therefore traditional public schools might mimic them in order to compete. Moreover, in response to the coercive pressure created by the accountability mandates of NCLB, market theory would argue that traditional public schools may look to charters as a model, especially since one of the ideas compelling charters has been their increased accountability (Center for Education Reform, 2009; Nathan, 1996; Wells, 2002).

School Organization as a Mediator

While a large body of research has examined whether choice and/or competition increase achievement among traditional public schools (Bifulco & Ladd, 2006; Booker et al., 2008; Hoxby, 2002, 2003; Sass, 2006), less inquiry has been devoted to understanding the specific mechanisms that are responsive to competition and responsible for promoting increased achievement. Some market proponents assert that increased competition will improve academic quality or *school organization* (Chubb & Moe, 1988; 1990; Hoxby, 2002). Within this context, school organization refers to the internal operations of schools or “the *process* through which schools produce desired outcomes” (Lee, Bryk, & Smith, 1993, 171).¹ School organization as a concept can be situated within the framework of effective schools research, which attempts to identify and understand the characteristics of schools that produce high levels of academic achievement among students. This body of literature focuses on features like rigor of the academic program, opportunity to learn and time on task, staff and teacher relations, principal leadership, school-family connections, and so on, that facilitate favorable academic outcomes for students (Chubb & Moe, 1990; Lee, Bryk, & Smith, 1993; Witte & Walsh, 1990). Though not all school practices necessarily result in improved achievement (for example, an emphasis on security and discipline), some, including increased opportunities for parental involvement, teacher quality, and time spent on instruction, enhance academic outcomes for students (Grubb & Allen, 2011). Thus, four core areas where the organization of charter schools, in theory, diverges from traditional public schools in ways that are predicted to increase achievement as a result of competition include:

Expanded opportunity to learn and an increased focus on high standards. Two core approaches utilized by charters to maximize student achievement involves expanding opportunity to learn by allocating more time for instruction and increasing academic standards (Center for Education Reform, 2009; Finn et al., 2000; U.S. Charter Schools, 2010; U.S. Department of Education, 2004; Zimmer & Buddin, 2007; Zimmer et al., 2003). One way many charters provide students with increased opportunity to learn is by increasing the length of the school day and/or school week (Center for Education Reform, 2009; Zimmer & Buddin, 2007; Zimmer et al., 2003). This substantially increases the total amount of instructional time for students. In addition, the charter movement emphasizes the positive academic climate fostered by charters in which there is an increased expectation for high achievement and curricula designed to promote high standards (Center for Education Reform, 2009; Finn et al., 2000; U.S. Charter Schools, 2010; U.S. Department of Education, 2004). Consequently, market theory would predict that in an effort to compete, traditional public schools facing competition from charters may mimic charter schools by allocating more time for instruction or by setting high standards for students.

Parental outreach and involvement. Charter school advocates also point out that charters

¹ Effective schools is another term associated with the process by which schools shape student achievement. Witte and Walsh (1990) define the phrase “effective schools” in the following manner: “In the most general sense the term connotes a belief and argument that school process, environment, and structure can make a difference in student achievement” (p. 188).

provide parents with significantly more opportunities for involvement and parent-teacher interaction, sometimes making it a requirement for enrolling their children in a charter (Becker et al, 1997; Finn et al., 2000; Nathan, 1996). Indeed, many parents elect to send their children to charters because they want more voice in their children's education (Stambach, 2001; Zernicke, 2002). Therefore, traditional public schools facing competition from charter schools might encourage more parental involvement to satiate parents and reduce the likelihood they will exit traditional public schools for a charter.

Increased effort and commitment from teachers. Market advocates contend that competition from charter schools will change the characteristics of and demands on personnel in traditional public schools (Hanushek & Rivkin, 2003; Hoxby, 2002). Market logic predicts that competition from charter schools will result in additional pressure on teachers to demonstrate increased effort. Competition may compel school administrators "to be more aggressive in pushing teachers to perform better and dismissing teachers who do not perform well" (Hanushek & Rivkin, 2003).

Innovation. Innovation refers to engaging in methods not commonly practiced in regular public schools, including using different instructional and pedagogical techniques and designing unique curricula and programs. Lubienski (2003) notes that innovation is not only a widely cited policy goal in charter school legislation across states, but also that charter reformers assume, consistent with market philosophies, that freedom from traditional bureaucratic school governance will result in the implementation of different and innovative practices to educate students.

Why Charter Competition May Not Lead to Improved Organization and Achievement

Although market models predict that competition from charter schools will force traditional public schools to be more like charter schools in order to compete, there are at least two reasons to expect that competition from charter schools would not induce public schools to change their organizational practices. First, rather than compelling traditional public schools to compete and change, institutional theories suggest that charter school growth will not lead to changes in organization among public schools because of deeply entrenched cultural and institutional rules that press charter schools to mimic traditional public schools and not the reverse (Goldring & Cravens, 2008; Lubeinski, 2003, 2005). Indeed, some research suggests that many charter schools' instructional, classroom, and administrative practices are more similar to traditional public schools than they are different. Moreover, others note that there are no mechanisms in place for charter schools and regular public schools to learn from one another (Hess et al., 2001; UCLA, 1998). In addition, charters may not lead to increased organization among traditional public schools if charter school location is a function of school and neighborhood characteristics (Betts, 2009). For example, if charters locate in economically disadvantaged areas where schools lack the resources to serve students well, regardless of competition, then charter schools may not be inducing change in ways predicted by the market model. A large body of literature in education documents the lack of resources among schools in poor neighborhoods (Adamson & Darling Hammond, 2012; Darling Hammond, 2004; Kozol, 2005; Loeb, Darling-Hammond, & Luczak, 2005; U.S. Department of Education, 2011). These schools are likely to have less funding and the concomitant problems associated with it including lower teacher quality, problems with physical resources and facilities, etc. Similarly, while charter school operators may intentionally locate close to schools that are already performing poorly in the hopes of attracting families dissatisfied with it (Betts, 2009), many charters also directly aim to serve students in such neighborhoods, not because they think they can compete

better, but rather because they are committed to improving outcomes for students in need (Pattillo, 2007).²

Empirical Research on Charter Competition

The empirical research on competition has generated mixed evidence regarding the effects of charter schools on traditional public school achievement (Bettinger, 2005; Booker et al., 2008; Hoxby, 2003; Sass, 2006; Zimmer & Buddin, 2009). Many of these studies combine measures of charter representation inside a district with geographical distance to traditional public schools. The rationale for this methodology is that regular public schools may feel more threatened and respond to a greater degree when charter schools are physically closer, since proximity potentially increases the likelihood that a charter might attract a school's students. Some studies find that charter competition within a 10 mile radius is associated with increased reading and math scores, but only by a fraction of a point for every percent increase in charter school representation (Booker et al., 2008; Holmes, DeSimone, & Rupp, 2003; Sass, 2006). Other studies find that competition from charter schools either reduces or has no impact on traditional public school student test scores (Bettinger, 2005; Bifulco & Ladd, 2006; Zimmer & Buddin, 2009). Moreover, different studies find conflicting results within a single state. For example, while Bettinger (2005) and Bifulco and Ladd (2006) find negative or negligible effects in Michigan and North Carolina, Hoxby (2003) and Holmes, DeSimone, and Rupp (2003) find positive effects in the same respective states.

To date, the body of research investigating the effects of competition on the inner workings of public schools is small. Using data from the Schools and Staffing Survey (SASS), a nationally representative data set on schools and teachers, Hoxby (2002) found more public school choice was associated with increased demand for teachers with degrees from selective colleges and teachers with advanced math and science skills, and was also associated with increased teacher effort and responsibility. However, although Hoxby found that competition was associated with increased selectivity and effort on the part of teachers, her study was limited to teacher attributes and did not examine the extent to which these attributes influenced achievement. Thus, we can only discern that competition was related to certain aspects of school organization, at least in terms of the selectivity and effort of teachers; we cannot ascertain whether those specific characteristics of teachers influenced student achievement.

Other evidence suggests that competition from charter schools may not be transforming the organization of traditional public schools in ways intended to facilitate academic achievement. Rofes (1998) studied twenty five districts affected by charter schools and found that most schools and school districts had not responded to charter schools with "swift, dramatic improvements."

² Another reason to expect that charter schools may not lead to meaningful changes in achievement in traditional public schools is because charter schools may act as "safety valves", relieving traditional public schools of burdens like overcrowding and low achieving and/or disadvantaged students (Hassel, 1998; RPP International, 2001). The exit of struggling students out of traditional public schools in districts with more charter options may explain the effect of charter competition on achievement. Previous research indicates that minority students, especially Black students, are overrepresented in charter schools, either because they are attracted by the mission of charters or because charters specifically target these students (Booker, Zimmer, & Buddin, 2005; Buckley & Schneider, 2005; Frankenberg, Siegel-Hawley, & Wang, 2011; Lacireno-Paquet et al., 2002; Finn et al., 2000; Miron & Nelson, 2002; RPP International, 2000; Zimmer et al., 2003). If charter schools siphon off minority students who typically have lower test scores (Jencks & Phillips, 1998), then scores in traditional public schools might increase. This safety valve effect is akin to selection bias – minority students are more likely to attend charters, therefore test scores in traditional public school test closer to a charter might increase for this reason.

Lubienski (2005) and Rofes (1998) found that many public schools and districts respond to increased numbers of charter schools by creating aggressive marketing and advertising campaigns or began offering before or after school care in an effort to keep parents in traditional public schools. Teske et al. (2000) studied the effects of charter school competition in four medium-sized Northeastern cities and the District of Columbia and found that charter competition had not “induced large changes in district-wide operations, despite the fact that a significant number of students left the district schools for charter schools” (p. 1). Similarly, Cannata (2011) found that principals felt competition from charter schools had little effect on their financial resources or their recruitment of teachers and students, while Arsen and Ni (2011) found that regular public schools in districts with more competition from charter schools were not more likely to shift financial resources to achievement related activities.

Methods

Data

I use data from the Early Childhood Longitudinal Study–Kindergarten Class (ECLS-K) and the Common Core of Data to assess the effects of charter school competition on school organization and student performance in regular public schools. ECLS-K is an up-to-date, nationally representative data set that includes comprehensive information on a large sample of primary school students and the schools they attend from kindergarten through 8th grade. A number of features of the ECLS-K make it well-suited for analyzing the relationship between competition, organization, and achievement. First, ECLS is advantageous because it contains a substantial set of measures assessing school organization. These organization measures are vital to understanding how schools respond to charter competition. In fact, this extensive focus on school practices makes ECLS-K an ideal data set to address the connection between school organization and school choice related issues (Berends & Tice, 2008). Second, ECLS-K allows me to tie school organization to student achievement, something that is scarce in the extant literature on public school choice and charter competition (Hoxby, 2002; Hanushek & Rivkin, 2003; RPP International, 2001). Third, previous studies have been limited to a single state or a restricted set of localities. Researchers have focused significant attention on states with strong charter laws and large numbers of charter schools, including Arizona, California, Texas, and Michigan (Bettinger, 2005; Booker et al., 2008; Hess et al., 2001; Hoxby, 2003; Sass, 2006). The rationale underlying such concentrated scrutiny has been that the effects of competition are best understood under those circumstances where charter competition is widespread, thereby generating “a viable, competitive charter sector and thus a potential traditional public school response” (Booker et al. 2008, 125). However, this kind of one-size-fits-all analysis is problematic because results from a single state may have few implications for other contexts (Cookson & Berger, 2002; Zimmer et al., 2003). Although state-level variation in charter laws is an important consideration, this variation can be controlled statistically using a nationally representative sample of students.

I use data from the third grade wave of data collection of ECLS, which assessed students and the schools they attended in the Spring of 2002. Although this time period captures charter schooling in its incipient stages, I limit my analysis to the third grade wave primarily because: a) the ECLS-K sample size is larger in the earlier waves; sample size decreases by about 20% in each successive wave due to student attrition b) more importantly, the third grade wave contained the most comprehensive set of school organization measures, in terms of focus and quantity. Specifically, the third grade wave of ECLS included more questions about general school and teacher practices whereas subsequent waves focused more on individual teacher methods and

teacher assessments of individual students and student outcomes. For example, in the later waves, the teacher surveys place a greater emphasis on asking teachers to evaluate student-specific behaviors, tendencies, and proficiencies (whether the surveyed child's parents have attended a parent-teacher conference, time spent on specific math, reading, and science concepts, whether the surveyed student is a discipline problem, etc.) rather than on more general teacher and school practices (frequency of parent-teacher conferences, overall time spent on math and reading lessons).³ While ECLS-K assesses students and their schools at fifth and eighth grades, almost all of the organization measures used here are assessed only at the third grade wave and are not assessed at the later time periods.

The Common Core of Data (CCD) is an annual census of all public schools and public school districts in the nation compiled by the National Center of Education Statistics under the auspices of the U.S. Department of Education. I combined school and district-level data from the 2000–2001 and 2001–2002 waves of CCD with student and school-level data from ECLS–K. Although there were a total of 15,305 students included in the third grade wave of ECLS, I eliminated 2,663 private school students and another 3,611 students who transferred schools between the first and third grade waves, the latter in an effort to limit the potential influence of student movement between schools (Betts, 2009; Ni, 2012). I was also forced to exclude the remaining students who lacked the proper sampling weights (primary sampling unit or strata weights, $N=2,558$ after the aforementioned ineligible students were dropped). While the use of survey weights resulted in a reduction in sample size, by design, the weights are adjusted for nonresponse. These adjustments ensure that the sample is still nationally representative even though some students are missing survey weights (NCES, 2003a). Thus, prior to the loss of missing data, only 6,727 of the 15,305 students in the third grade wave of ECLS were eligible for analysis. To account for missing data, I use multiple imputation for all ordinal and interval-ratio variables ($M=5$). After the exclusion of 812 cases with no distance measures (as a result of improper latitude and longitude information in CCD) and another 63 cases with missing data on some nominal variable, my final sample consisted of 5, 852 students in 836 traditional public schools (see Table A1).

Dependent Variables

School organization. I used two sets of measures taken from teacher and school administrator surveys of ECLS-K that, based on previous research on charter schools, capture the core organizational practices and schooling activities believed to differentiate charter schools from traditional public schools including opportunity to learn and a focus on high standards, parental outreach, teacher effort, and innovation (Center for Education Reform, 2009; Hoxby, 2002; Lubienski, 2003; Nathan, 1996; UCLA, 1998; Finn et al., 2000). Although ECLS gathers information on school characteristics and practices from both teachers and administrators, some of the measures are self-reported data gathered from a single school administrator. Because of potential bias inherent in self-report measures (Donaldson & Grant-Vallone, 2002), and in light of previous research, which suggests that principals may feel more pressure from charter competition (Teske et al., 2000), I used measures from both teachers and administrators wherever possible to gain a more reliable representation of school organization. The first set of measures came from teacher surveys assessing how much class time per day teachers spend on reading and math lessons or projects (opportunity

³ In fact, both the 5th and 8th grade waves of the data fail to ask teachers or administrators about the general frequency of parent teacher conferences. Previous research (Finn et al., 2000; Zimmer et al., 2003) suggests that charter schools provide parents with significantly more opportunity to interact with teachers. Consequently, this is a very important topic area that these waves do not address.

to learn), whether teachers feel academic standards in the school are too low (focus on high standards), how many regularly scheduled parent conferences are offered by teachers during the year (parental outreach), and how many hours outside the workday teachers spend preparing for their classes (also teacher effort). The second set of organization measures consists of school administrator responses to five questions. The first of these questions asked administrators to rate the frequency of teacher-parent conferences (parental outreach). The second question asked administrators to rate the extent to which teacher absenteeism was a problem at their school (teacher effort). The remaining three measures asked principals to assess how much emphasis they place on the following goals and objectives: using curricula aligned and instructional strategies aligned with high standards (focus on high standards), and openness to new ideas and methods (innovation).

Student achievement. I used third grade reading and math IRT scores as measures of achievement.

Key Independent Variable

Charter school competition. I used a proximity measure that calculated the distance between each traditional public school and the nearest elementary and middle grade charter schools in each state as my primary measure of competition. To generate this measure, I matched each traditional public school in ECLS (N=2,388) with each elementary/middle grade charter school in the nation (N=1,036) in 2000 through CCD; I retained only those matches that were located in the same state. Then, using longitude and latitude data available for all schools in the 2000–2001 wave of CCD (supplemented by latitude and longitude information obtained through geocoding when this information was unavailable in CCD), I used the SPHDIST command in STATA to measure the distance between each traditional public school and each of its elementary/middle grade charter matches.⁴ Since there is significant variation and overlap in grade level cutoffs for schools across schools and districts, especially charter schools, the distance measure used here includes elementary as well as middle school charters. For example, while traditional elementary schools in a respective locality may include kindergarten through fifth grade, a charter school in that locality serving 3rd grade students may house kindergarten through eighth grade.

I utilized the distance between each school in the final ECLS sample and the *single* closest charter in the state as the nearest distance measure. Since a distance of zero miles means that there are no charters in a state, I created a series of dummy categories for distance to the nearest charter. These dummies include whether the nearest elementary or middle grade charter school is within 2.5 miles or less, 2.51 to 5 miles, 5.1 miles to 10 miles, 10.1 miles to 25 miles, or more than 25 miles. The distance variable is lagged and measured in the 2000–2001 school year, the year prior to when organization and achievement are measured.

State and District-Level Controls

Restrictiveness of charter school laws. Given concerns about variation in charter school laws across states and the implications this has for the potential impact of competition, I include a measure intended to capture limitations placed on charter school growth across states. This measure ranks states in terms of the restrictiveness of their charter school legislation. This variable was taken from The Center for Education Reform's 2000 report on Charter School Legislation and State Rankings. Each state was assigned a ranking based on ten criteria regarding the openness of their

⁴ I used geographic information systems (GIS) software to generate latitude and longitude coordinates for school addresses when this information was missing from CCD. Despite these added efforts, many of the schools with missing latitude and longitude coordinates have post office boxes listed as their address, making efforts to generate coordinates for them futile, since they do not represent the physical location of the school.

charter school laws.⁵ The original rankings ranged from 1 to 37, with lower scores indicating laws that contribute positively to the growth and development of charter schools. Since the scale is coded so that higher scores indicate less favorable charter laws, I add the score 38 to the scale to represent states with no charter laws and no charter schools.⁶

District enrollment, and per pupil expenditures. In addition, some research indicates that schools in districts with larger enrollments feel less threatened by the emergence of charter schools than smaller districts (Arsen & Ni, 2008; Hess et al., Rofes, 1998; RPP International, 2001). I include data on district enrollment from CCD to control for this possibility. In addition, I include a per pupil expenditure variable that accounts for financial resources spent per student within each district. Both variables were taken from the 2001 CCD District Finance file.

School-Level Controls

I include school SES and school racial composition to gauge the resources available to schools as well as the characteristics of the student body. I use the percentage of students eligible for free and reduced lunch as indicators of school SES and the percentage of White students in a school as a measure of school racial composition. Moreover, in light of research which suggests school size may be related to achievement as well as organization (Lee, Bryk, & Smith, 1993), I include student enrollment to account for this possibility.⁷

Student-Level Controls

I include student prior achievement, race, SES, and gender as predictors of student-level achievement. I use student 1st grade reading and math IRT scores as measures of prior achievement. Race is a five category dummy-coded variable. Gender is a dichotomous variable with female coded as 1. ECLS uses a composite variable comprised of mother and father's education and occupation and household income to measure SES. It reflects the family's socioeconomic status at the time of data collection (Spring of 1st grade). It is a standardized scale with a mean of 0 and a standard

⁵ These ten criteria include: a) restrictions on the number of charter schools open at one time, b) allowing entities other than the local school board to authorize charter schools, c) permitting a variety of persons/groups to start charter schools, d) permitting charter schools to open without evidence of local support, e) extending legal autonomy to charter schools, f) permitting charter schools to start from scratch rather than only allowing conversion charters (schools that were once traditional public schools), g) guaranteeing 100% of per-pupil funding, h) freeing charter schools from restrictions on local school district's collective bargaining agreements, i) granting charter schools control over how funds are spent, and j) exempting charter schools from state education laws and regulations.

⁶ I tested an alternative means of accounting for this unmeasured variation: a state-level fixed effects model using dummies for each state (where all states without charters were the single reference category). This method suffered from collinearity problems and many of the dummies were automatically omitted from the analysis. Consequently, I use the Center for Education Reform measure instead.

⁷ While it is certainly plausible that school organizational characteristics affect student achievement, schools also "need a nucleus of motivated and academically able students to provide a stable institutional base" (Lee, Bryk, & Smith 1993). Average aggregate achievement at the school-level may affect which practices schools are able or see fit to implement (Barr & Dreeben 1983). For example, a school with high levels of achievement may be more (or less) innovative than a school with low levels of achievement where personnel may think a "basics" approach may benefit low achieving students most. In supplementary analyses not reported here, I accounted for this possibility by controlling for prior achievement at the school-level. I used 1st grade math and reading IRT scores, aggregated at the school-level, to measure school-level prior achievement. I tested the impact of these measures only in the analyses assessing the relationship between competition and school organization. Their exclusion does not affect the general pattern of results.

deviation of 1. Scores below zero reflect a family SES less than the mean and scores above 1 reflect an SES above the mean (See Table A2).

Analytic Strategy

There are three considerations that compel the analytic strategy. Two considerations involve data design. First, the data is hierarchically structured: students are nested within schools, which are in turn nested within states. Since standard regression analyses ignore clustering and the problems associated with it (independence of observations, standard errors that are too small), it is important to use a modeling strategy, which takes the nested structure of the data into consideration.

The second consideration involves sampling design and the survey weights generated to account for this. As a result, I use the set of SVY commands in STATA to analyze the data.⁸ These commands were designed to analyze data with complex sampling designs involving weighting, clustering, and stratification.⁹

The third consideration driving the analytic strategy involves the hypotheses regarding organization as an intervening variable mediating the relationship between competition and achievement. This consideration dictates the sequence of the analyses. The analytic model is depicted in Figure 1. The most common method for establishing mediation in a model like that presented in Figure 1 involves testing four sequential regression equations. These equations are:

$$Y = i1 + cX + e1 \quad (1)$$

$$M = i2 + aX + e2 \quad (2)$$

$$Y = i3 + bM + e3 \quad (3)$$

$$Y = i4 + c'X + b'M + e4 \quad (4)$$

where Y refers to achievement, X refers to competition, and M refers to organization, c is the coefficient relating competition to achievement, a is the coefficient relating competition to organization, b is the coefficient relating organization to achievement, c' is the coefficient relating competition to achievement adjusted for organization, b' is the coefficient relating organization to achievement adjusted for the effect of competition, $i1$, $i2$, $i3$, and $i4$ are intercepts and $e1$, $e2$, $e3$, and $e4$ are residuals (Baron & Kenny, 1986; MacKinnon et al., 2007).¹⁰ While this method requires that researchers first establish a direct relationship between X and Y, for purposes of this analysis, this is a substantively meaningless step, since I (nor the market model I am testing) make specific arguments about the effect of competition existing independent of organization. In other words, my goal is to ultimately test the indirect effect of competition on achievement through organization, and the method I use requires that I establish a significant direct path between competition and achievement first.

⁸ Krull and Mackinnon (1999) find that OLS estimators of multilevel mediation models are less efficient at estimating mediated effects than multilevel estimators because they lead to downwardly biased standard errors. Although I do not use multilevel estimators specifically, the SVY commands in STATA are commonly used to account for clustering issues that lead to downwardly biased standard errors.

⁹ I use the variable C5CPTPSU for the PSU weight, the variable C5CPTSTR as the strata weight, and C5CW0 as the student-level weight. For more information about these weights, see the ECLS-K Third Grade User's Manual (NCES, 2003).

¹⁰ Recent research has been critical of the Baron and Kenny (1986) method for establishing mediation (Gelfand, Mensinger, & Tenhave, 2009; Kraemer, Kiernan, Essex, & Kupfer 2008; Mackinnon et al., 2007). Kraemer et al. (2008) and Mackinnon et al. (2007) argue that in order to establish mediation, researchers must also demonstrate that X and M interact. While I considered this analytic strategy, none of the sources promoting this method provide details on a subsequent test for partial mediation (e.g. something comparable to a Sobel test). Therefore, I proceeded with Baron and Kenny's approach.

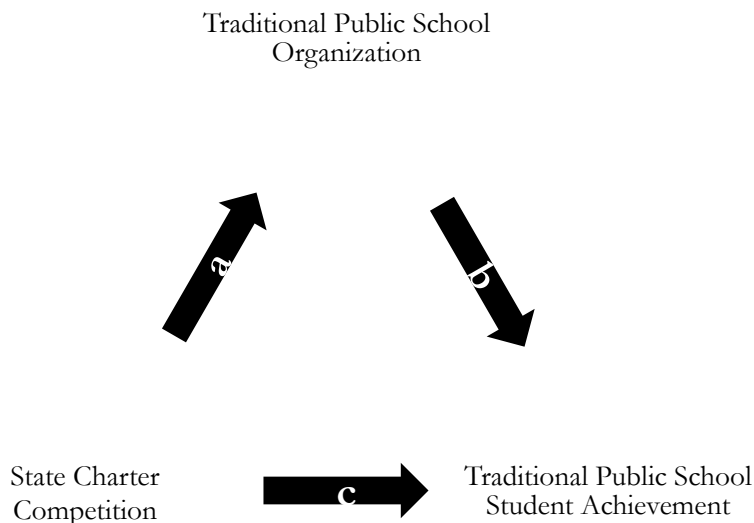


Figure 1. Conceptual Model Depicting Predicted Relationship between State Charter Competition, School Organization, and Achievement in Traditional Public Schools

However, there are two problems with this approach to establishing mediation. First, this method does not provide a statistical test of the indirect effect of the independent variable (charter competition) on the dependent variable (achievement) through the mediator (organization). Second, the requirement that there must be a direct effect of X on Y to establish complete mediation may lead to an increased probability of Type II errors, as one may still be able to establish partial mediation by examining the indirect effect of X on Y (MacKinnon et al. 2002). An alternative method requires testing the significance of the indirect effect using a Sobel (1982) test. The formula for the Sobel test is:

$$z = \frac{a*b}{\sqrt{b^2*s_a^2 + a^2*s_b^2}} \quad (5)$$

where the terms for a and b in equations 2 and 3 are multiplied, then divided by the square root of the sum of the squared a and b terms multiplied by the other term's squared standard error. The resulting term is then compared to a standard normal distribution to test for significance. I use the Sobel test in combination with the step method to assess relationship between charter competition, school organization, and achievement. Due to space limitations, I present the coefficients for the key independent variables only.¹¹

One limitation of the ECLS data stems primarily from omitted variable bias regarding why charters school locate where they do as well as the lack of consistency of measures across the various waves of data collection. In charter school research, scholars are concerned with endogeneity regarding where charter schools locate and in turn who they serve or self-selection bias that influences who attends charters versus traditional public schools. Charter schools may not randomly locate and there are plausible reasons to believe that charter schools might be in greater demand near schools and districts that are dysfunctional. This is problematic because non-random effects potentially mask any positive influence charter school competition might have on school organization. Some research suggests that charters are more likely to locate in minority

¹¹ Full tables are available upon request.

neighborhoods, though these neighborhoods tend to be middle-class rather than poor (Henig & McDonald, 2002).

Researchers typically use fixed effects models or instrumental variable approaches (Bifulco & Ladd, 2006; Hoxby, 2002; Sass, 2006) to eliminate bias stemming from unobserved characteristics dictating the non-random location of charter schools that could affect the relationship between the charter competition and achievement. By eliminating this bias, these techniques strengthen the case for causal inference. However, both methods were problematic here. School fixed effects models were problematic because they are only appropriate to use with panel or longitudinal data where each variable is measured at more than one time point. Although ECLS is longitudinal, many of the teachers reported measures of school organization I utilize are only collected at the 3rd grade wave of data collection. Consequently, since many key variables have no temporally prior or later match, I was forced to find another way to account for the potential nonrandom location of charters. Similarly, although the data structure was amenable to an instrumental variable approach, instrumental variables are not always an ideal solution to resolving problems associated with omitted variable bias since faulty instruments can yield extremely biased estimates, ironically despite the method's primary aim to produce unbiased ones. I tested five instruments — charter school law openness, district size, percent of Black and Hispanic residents in each traditional public school's census tract, and percent of people below the poverty line in each traditional public school's census tract. All proved to be inadequate as they yielded improbable coefficients.

Results

Descriptive results

Table 1 displays weighted means for the key variables, first for all students, then separately for students in schools with charter competition and students without. Seventy-seven percent of the students in the final sample are enrolled in schools in states with charters (roughly 4500 of the 5800 students). Since charter schools only enroll approximately 2-3% of students nationwide, this measure of competition is therefore quite broad. On average, the nearest charter school is located about 30 miles away from each student's traditional public school. Thus, although the majority of students in the sample attend traditional public schools in states with charters, the nearest charters are still, on average, over 25 miles away. Table 2 clarifies this result. About one-quarter of the traditional public schools students in the sample are in schools located 2.5 miles or less from a charter, while another quarter of the students are enrolled in schools more than 25 miles from a charter. The remaining students are distributed among the other distances. The smallest percentage of students (6%) are enrolled in schools in the 2.51 to 5 mile range. With regard to the achievement and organization measures, Table 1 shows that at first glance, there do not appear to be strong differences between traditional public schools facing competition from charters versus those not facing charter competition. Thus, although the market model assumes that organizational changes will occur as a response to competition, these descriptive statistics suggest there is little variation in the organizational characteristics between schools facing competition and those lacking competition from charters.

To better understand the magnitude of these differences, I calculated the difference between the mean for traditional public schools facing competition from charters and traditional public schools with no competition as a percentage.¹² The largest difference between the two groups is for

¹² I used the following formula to calculate these differences: $\left(\frac{\bar{X}_{\text{No Competition}} - \bar{X}_{\text{Competition}}}{\bar{X}_{\text{No Competition}}} \right) * 100$.

academic standards being too low and teacher absenteeism. Teachers and administrators in schools facing competition are 5.78% less likely to report that standards are too low and 5.58% less likely to report that teacher absenteeism is a problem compared to schools not facing competition. Among the remaining variables, the differences between the groups range from 0.06% and 2.12%. Moreover, five of these differences are not in the direction predicted by the market model. The market model suggests that schools facing charter competition should have superior organizational characteristics compared to charter schools, yet, the findings here indicate that teachers in schools facing competition from charters spend less time on reading and less unpaid time preparing lessons, while administrators are less likely to report having curricula aligned with high standards and being open to new ideas and methods, and report having fewer parent-teacher conferences (though these differences are small).

Is charter competition associated with traditional public school student achievement?

I begin the multivariate analyses by estimating the direct effect of charter school competition on reading and math achievement. This is represented by Path c in Figure 1; these results are presented in Table 3. Market models predict that students in areas with more competition from charter schools will have significantly higher test scores than students in districts with less competition from charter schools. Contrary to these predictions, the findings indicate that distance to a charter school has no association with either reading or math achievement. Still, despite the insignificance of this direct path from competition to achievement, competition may still impact achievement through organization, which the proceeding analyses aim to test.

Is charter competition associated with traditional public school organization?

In this set of analyses, I test the relationship between charter competition and the various aspects of traditional public school organization, which I define as the practices and methods associated with learning that are carried out in schools. This analysis is represented by Path a in Figure 1; the results are presented in Table 4. Each column in the table represents a different measure of school organization. Table 4 shows that distance to the nearest charter school is associated with one teacher reported organization variable — whether teachers feel that academic standards are too low. The coefficient is significant and negative for all the distance categories except the 2.5 mile or less category. This question is worded so that a high score indicates that teachers *agree* with the statement “the academic standards at this school are too low”, thus lower scores mean that teachers disagree with the statement. Substantively, this finding indicates that compared to traditional public schools that have no charters in their state, teachers in traditional public schools facing competition from charters feel that standards are *not* too low. The coefficients are largest for the 2.51–5 and 5.1–10 mile categories. Thus, teachers believe standards are high (enough) at these distances. However, the coefficients are smaller for the higher distance categories. This means that even when traditional public schools are more than 10 and 25 miles away from charters, teachers still believe that academic standards are high compared to teachers in states with no charter schools, but not as much as teachers in schools closer to charters. Nevertheless, the fact that teacher reports for this measure in schools closest to charters (the 2.5 mile or less category) are statistically no different than teachers in schools facing no charter competition may reflect some bias associated with where charter schools locate. For instance, if charters are located in areas where traditional public schools are underresourced or contain a large body of students who struggle

Table 1.
Descriptive Results for Key Variables (Weighted)

	All Students (N= 5,852)	S. E. of Mean	No Charter Competition (N=1,342)	Charter Competition (N=4,510)	Description
<u>Competition Measure</u>					
Distance to Nearest Charter School (Statewide)	-	-	-	30.066	Distance to the nearest elementary or middle grade charter school in the state (Min=0, Max=231.754)
<u>Teacher Reported Measures</u>					
Time Spent on Reading Lessons and Projects	3.203	.024	3.217	3.199	How much time do children in your class work on lessons or projects in the following general topic area, whether as a whole class, in small groups, or in individualized arrangements? Reading/language arts (1=1-30 minutes to 4=more than 90 minutes)
Time Spent on Math Lessons and Projects	2.403	.019	2.364	2.414	How much time do children in your class work on lessons or projects in the following general topic area, whether as a whole class, in small groups, or in individualized arrangements? Mathematics (1=1-30 minutes to 4=more than 90 minutes)
Academic Standards too Low	1.817	.023	1.902	1.792	Indicate the extent to which you agree with the statement “academic standards at this school are too low” (1=strongly disagree to 5=strongly agree)
Number of Regularly Scheduled Teacher-Parent Conferences	2.933	.032	2.923	2.936	How many regularly scheduled conferences do you offer or schedule with a parent or guardian of each child in your class during the school year? (1=no conferences to 4=3 or more conferences)
Unpaid Time Spent Preparing Lessons	3.455	.031	3.457	3.455	Other than time spent during the work day, on average how many hours per week do you spend preparing for the class you teach (1=2 hours or less per week to 5=15 or more hours per week)
<u>Administrator Reported Measures</u>					
Using Curricula Aligned with High Standards	2.914	.010	2.917	2.913	How much emphasis do you place on the following goals and objectives for your teachers? Using curricula aligned with high standards. (1=no emphasis to 3=major emphasis)
Using Instructional Strategies Aligned with High Standards	2.873	.013	2.847	2.881	How much emphasis do you place on the following goals and objectives for your teachers? Using instructional strategies aligned with high standards. (1=no emphasis to 3=major emphasis)
Openness to New Ideas and Methods	2.813	.013	2.835	2.806	How much emphasis do you place on the following goals and objectives for your teachers? Openness to new ideas and methods. (1=no emphasis to 3=major emphasis)
Frequency of Teacher-Parent Conferences	3.058	.029	3.095	3.047	Please indicate how often the following activities are provided by your school: Teacher- parent conferences. (1=never to 5=7 or more times a year)
Teacher Absenteeism a Problem	1.882	.031	1.971	1.861	Indicate how much you agree or disagree with the following statement: Teacher absenteeism is a problem at this school. (1=strongly disagree to 5=strongly agree)
<u>Student-Level Achievement Measures</u>					
3 rd Grade Reading IRT Score	107.879	.676	108.788	107.613	Min=42.42, Max=148.950
3 rd Grade Math IRT Score	85.259	.645	85.571	85.155	Min=30.310, Max=120.420

Table 2.
Share of Students in Each Charter School Distance Category

Percent of Students in Schools Not Facing Charter Competition	22.932% (N=1,342)
Percent of Students in Schools Located 2.5 Miles or Less from a Charter	25.393% (N=1,486)
Percent of Students in Schools Located 2.51 to 5 Miles from a Charter	6.374% (N=373)
Percent of Students in Schools Located 5.1 to 10 Miles from a Charter	10.407% (N=609)
Percent of Students in Schools Located 10.1 to 25 Miles from a Charter	10.116% (N=592)
Percent of Students in Schools Located 25 Miles or More from a Charter	24.778% (N=1,450)
Total	100% (N=5,852)

Table 3.
Weighted OLS Regression Estimates (Unstandardized) of Charter School Distance on Traditional Public School Reading and Math Achievement

	Reading	Math
Distance to Nearest Elementary/Middle Grade Charter School: 2.5 miles or less	-.729 (.965)	-.090 (.770)
Distance to Nearest Elementary/Middle Grade Charter School: 2.51-5 miles	-.518 (.982)	-.402 (1.246)
Distance to Nearest Elementary/Middle Grade Charter School :5.1-10 miles	1.425+ (.841)	.708 (1.000)
Distance to Nearest Elementary/Middle Grade Charter School :10.1-25 miles	.152 (.796)	.631 (.955)
Distance to Nearest Elementary/Middle Grade Charter School: more than 25 miles	.198 (.652)	-.037 (.706)
Constant	64.665	45.577
F statistic	301.31	422.88
N	5,852	5,852

Note: All models control for student-level 1st grade achievement, SES, gender, race (White, Black, Hispanic, Asian, Other), school-level % free and reduced lunch, % White, school size, urban vs. suburban/rural, region (northeast, vs. west/south/Midwest), and district-level per pupil expenditures and enrollment. All models also include a control for charter limitations across states).

Standard errors in parentheses. * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$.

academically, school personnel may adjust their standards in light of this reality. Indeed, all the teacher and principal organization measures in the 2.5 mile or less category do not differ statistically from those of teachers and principals in traditional public schools facing no competition.

Table 4 also shows that distance from a charter school is associated with two administrator reported organization variables – emphasizing instructional strategies aligned with high standards and teacher absenteeism. Proximity to a charter appears to matter only for schools in the middle ranges of distance, not at the extremes, even the closest distances. Compared to traditional public schools without charters in their state, principals in traditional public schools located between 2.5 and 10 miles away from charters report lower levels of teacher absenteeism. Similarly, principals of traditional public schools located between 5.1 and 10 miles away from charter schools are more likely to report that instructional strategies at their school are aligned with high standards. As with academic standards, traditional public schools in the 2.5 mile or less range appear statistically no different than traditional public schools in states without charters with regard to instructional strategies and teacher absenteeism.

Taken together, these results provide limited support for the market model. The next set of analyses address whether organization mediates the relationship between competition and achievement.

Does organization mediate the charter competition effect on achievement?

The results from the two previous analyses offer evidence that is only minimally consistent with the market model of competition. Reading and math achievement were not associated with distance to the single nearest charter, though three of the organization variables – academic standards being too low, aligning instruction with high standards, and principal reports of teacher absenteeism – were related to distance. Thus, even though charter competition had no direct effect on achievement, if the organization variables that were influenced by competition also influence achievement, then it is possible to make the case that charter competition may indirectly affect achievement. This indirect relationship is consistent with criticisms of the step method for establishing mediation, specifically that a failure to establish a significant direct path between the independent and dependent variable leads to Type II errors because there may be a significant indirect pathway through the mediator (MacKinnon et al. 2002).

Tables 5 and 6 present the results of analyses where I assess the impact of the ten organization variables on reading and math achievement (path b of Figure 1). Only one of the organization variables is associated with reading achievement in the expected direction (principal reported frequency of parent-teacher conferences), while three are associated with math achievement (time spent on math, principal reported frequency of parent-teacher conferences, and teacher absenteeism). While it is disappointing to consider that even these characteristics of schools appear to have little impact on achievement (Grubb & Allen, 2011; Hanushek, 2003), there may be some reason to expect that student background characteristics have a greater impact on reading achievement than school factors (Coleman, 1966; Entwisle & Alexander, 1994). Still, the school organizational characteristics that were affected by competition did not affect achievement, at least reading achievement. Consequently the only organization variable that has potential for partially mediating the relationship between organization and achievement is teacher absenteeism for the 2.51 to 5 mile category and the 5.1 to 10 mile category for math achievement. Teacher absenteeism is associated with competition and math achievement; consequently, it meets the criteria for partial mediation.

To explore this possibility, I use the Sobel (1982) method of testing the significance of the indirect effect. Two of these indirect effects reach marginal statistical significance. The resulting z statistic for teacher absenteeism for traditional public schools located 2.51 to 5 miles away from charters is 1.844 and the corresponding p-value is .065. The resulting z statistic for teacher absenteeism for traditional public schools located 5 to 10 miles away from charters is 1.709 and the corresponding p-value is .105. Both just miss the conventional criterion for statistical significance ($p \leq .05$), though they both fall within the range of marginal significance ($p \leq .10$).¹³

Discussion

This study used a nationally representative data set to examine the relationship between charter school competition, school practices, and achievement in traditional public schools. Advocates for market reform argue that charter schools benefit students in traditional public schools because the threat of losing students to charters will force traditional public schools to better serve

¹³ I use Kristopher J. Preacher's interactive calculator for the Sobel test available at <http://quantpsy.org/sobel/sobel.htm>

Table 4.
Weighted OLS Regression Estimates (Unstandardized) of Teacher and Administrator Reported School Organization on Charter School Distance

	Teacher Reported Measures					Administrator Reported Measures				
	Time spent on reading	Time on spent math	Academic standards too low	Regularly scheduled parent conf.	Unpaid preparation time	Curricula aligned with high standards	Instruction aligned with high standards	Openness to new ideas and methods	Frequency of parent-teacher conf.	Teacher absenteeism
Distance to Nearest Charter: 2.5 miles or less	-.052 (.076)	-.011 (.061)	-.126 (.082)	.101 (.089)	-.184 (.100)	.008 (.028)	.026 (.032)	.018 (.064)	-.059 (.127)	-.114 (.112)
Distance to Nearest Charter: 2.51 - 5 miles	.077 (.093)	.005 (.075)	-.241* (.113)	.076 (.104)	-.173 (.134)	-.078 (.056)	.001 (.054)	.064 (.069)	.118 (.141)	-.272* (.117)
Distance to Nearest Charter: 5.1 miles - 10 miles	-.028 (.096)	.020 (.077)	-.261** (.093)	.062 (.086)	-.033 (.123)	.006 (.042)	.080* (.033)	-.005 (.068)	.172 (.125)	-.234* (.113)
Distance to Nearest Charter:10.1 - 25 miles	.069 (.104)	-.010 (.063)	-.176* (.088)	.046 (.100)	-.074 (.126)	-.032 (.030)	.051 (.040)	.020 (.083)	-.034 (.135)	-.068 (.144)
Distance to Nearest Charter: more than 25 miles	-.036 (.075)	.016 (.055)	-.153* (.074)	.000 (.089)	-.034 (.083)	-.004 (.026)	.030 (.034)	-.004 (.057)	-.107 (.094)	-.043 (.081)
State Charter Law Ranking	.002* (.002)	-.002 (.002)	-.004 (.002)	.002 (.089)	-.006* (.003)	-.000 (.001)	.000 (.001)	.003 (.001)	.000 (.004)	.002 (.004)
Constant	3.019	2.339	2.270	3.039	3.379	2.890	2.908	2.916	3.457	1.241
F statistic	2.91***	3.34***	6.76***	5.16***	4.17***	1.17	1.20	3.21***	6.53***	8.26***
N	5,852	5,852	5,852	5,852	5,852	5,852	5,852	5,852	5,852	5,852

Note: All models control for % free and reduced lunch, % White, school size, urban vs. suburban/rural, region (northeast, vs. west/south/Midwest), and district-level per pupil expenditures and enrollment. Standard errors in parentheses. * p ≤ .05, ** p ≤ .01, *** p ≤ .001.

Table 5.
Weighted OLS Regression Estimates (Unstandardized) of Teacher and Administrator Reported School Organization on Traditional Public School Reading Achievement

	1	2	3	4	5	6	7	8	9
<u>Organization</u>									
Time Spent on Reading	.087 (.259)								
Academic Standards too Low		.114 (.288)							
# of Regularly Scheduled Parent Conferences (Teacher)			.182 (.406)						
Unpaid Preparation Time				-.045 (.207)					
Curricula Aligned with High Standards					.309 (.723)				
Instructional Strategies Aligned with High Standards						-.350 (.610)			
Openness to New Ideas and Methods							-1.234* (.553)		
Frequency of Parent-Teacher Conferences (Principal)								.610* (.313)	
Teacher Absenteeism									-.717 (.421)
Constant	64.215	64.227	63.918	64.649	63.591	65.518	68.092	62.437	65.487
F statistic	231.48***	231.87***	243.87***	231.51***	235.91***	242.93***	238.53***	235.79***	240.94***
N	5,852	5,852	5,852	5,852	5,852	5,852	5,852	5,852	5,852

Note: All models control for student-level 1st grade achievement, SES, gender, race (White, Black, Hispanic, Asian, Other), school-level % free and reduced lunch, % White, school size, urban vs. suburban/rural, region (northeast, vs. west/south/Midwest), and district-level per pupil expenditures and enrollment. Standard errors in parentheses. * p ≤ .05, ** p ≤ .01, *** p ≤ .001.

Table 6.
Weighted OLS Regression Estimates (Unstandardized) of Teacher and Administrator Reported School Organization on Traditional Public School Math Achievement

	1	2	3	4	5	6	7	8	9
<u>Organization</u>									
Time Spent on Math	1.171*** (.324)								
Academic Standards too Low		.583* (.257)							
# of Regularly Scheduled Parent Conferences (Teacher)			.030 (.298)						
Unpaid Time Spent Planning Lessons				.112 (.159)					
Curricula Aligned with High Standards					.795 (.841)				
Instructional Strategies Aligned with High Standards						-.148 (.659)			
Openness to New Ideas and Methods							-1.229* (.592)		
Frequency of Parent-Teacher Conferences (Principal)								.620** (.252)	
Teacher Absenteeism									-.769** (.254)
Constant	42.844	44.211	45.385	45.091	43.180	45.910	49.065	43.342	46.394
F statistic	464.33***	474.43***	462.04***	454.61***	465.04***	486.31***	461.87***	455.54***	462.67***
N	5,852	5,852	5,852	5,852	5,852	5,852	5,852	5,852	5,852

Note: All models control for student-level 1st grade achievement, SES, gender, race (White, Black, Hispanic, Asian, Other), school-level % free and reduced lunch, % White, school size, urban vs. suburban/rural, region (northeast, vs. west/south/Midwest), and district-level per pupil expenditures and enrollment. Standard errors in parentheses. * p ≤ .05, ** p ≤ .01, *** p ≤ .001.

the students who remain in them, though the evidence investigating this claim has been mixed. This study's main contribution centers on pinpointing a mechanism that is related to both charter competition and achievement in traditional public schools.

The evidence presented here provides little support for the market model. The first set of findings suggests that proximity to a charter school has no impact on either reading or math achievement. However, three of the ten organization variables examined were associated with distance to a charter, but not for traditional public schools closest to charters. Instead, charter proximity only seemed to matter for schools between 5 and 10 miles from charters, not the closest category used here, which was 2.5 miles or less. Teachers were more likely to report that academic standards were higher in all the distance categories other than the 2.5 mile category, while principals were more likely to report increased frequency of parent-teacher conferences and lower levels of teacher absenteeism at the middle ranges of distance from a charter. Finally, though teacher absenteeism was the only organization variable associated with both organization and achievement, leaving some possibility for establishing an indirect relationship between charter competition and achievement, the results of analyses testing the significance of the indirect effect of distance to the nearest charter on math and reading achievement through teacher absenteeism fell slightly short of conventional statistical significance.

What explains the limited evidence for the market model? A simple explanation is that competition from charter schools may not be associated with significant improvements in organization or achievement. On the other hand, these findings may highlight problematic assumptions about competition and the capacity of traditional schools to respond to it. Traditional public schools may be limited in their ability to respond to competition because they may lack the finances or power to implement change (Betts, 2009; Rofes, 1998; Teske et al., 2001). This possibility seems to be illustrated in the lack of findings for traditional public schools closest to charters (located within 2.5 miles of the nearest charter). These schools may not have the resources, human or fiscal, to respond to competition, particularly if charters intentionally locate in neighborhoods with high concentrations of poor and minority students. Thus, the lack of findings for close proximity to a charter may reflect bias from unmeasured variables, since I was unable to control for decisions influencing where charters locate. Charters may intentionally locate close to underperforming schools, making it appear that close proximity to a charter would have no effect on achievement or organization. This is, admittedly, a limitation of this research and future research should consider establishing a more direct causal link by using methods to control for omitted variable bias. In spite of this minor shortcoming, ECLS is one of the only existing nationally representative data sets that allow researchers to link student achievement to school organization, and in combination with CCD, allow me to tie charter competition to these processes. Consequently, this analysis represents a compelling step toward understanding the mechanisms linking market reform to educational outcomes.

In addition, although charter competition was associated with improved aspects of organization, these changes appear to have been too modest to yield any meaningful improvements in achievement. However, some research suggests that charter competition may affect the scores of minority students far more than White students (Booker et al., 2008). Since I do not separate traditional public school students into subgroups, it is possible that competition and its concomitant association with organization may be more beneficial to disadvantaged students.

While the lack of evidence supporting the notion that charters increase achievement reinforces some existing research (Bettinger, 2005; Bifulco & Ladd, 2006; Zimmer & Buddin, 2009), the findings of this study contribute to the literature on competition in education in two important ways. First, it adds to the even smaller body of literature assessing the impact of charter competition on school organization (Arsen & Ni, 2011; Cannata, 2011; Lubeinski, 2005; Rofes, 1998). More

importantly, the present research makes the case that the connections between competition/organization and organization/achievement should be analyzed in tandem, since the organizational factors influenced by competition did not necessarily influence achievement, particularly reading achievement. This connection between organization and achievement is important, since policy efforts devoted to using charter competition to improve practices that have no impact on achievement would potentially waste valuable resources (Grubb & Allen, 2011; Hanushek, 2003).

While competition from charter schools does not seem to improve student achievement in traditional public schools, charter schools still provide a meaningful alternative for many parents and students in search of schooling options (Coons & Sugarman, 1978). Thus, this study does not seek to malign charter schools. Rather, these findings draw attention to some of the limits and possibilities of market ideology as a solution to the problems plaguing American education.

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Table A1.
Missing Data for Key Variables

	Percent of Imputed Cases (out of 5,852 cases)
<u>Teacher Reported Organization Measures</u>	
Time Spent on Reading Lessons and Projects	5.297%
Time Spent on Math Lessons and Projects	5.007%
Academic Standards too Low	.547%
Number of Regularly Scheduled Teacher-Parent Conferences	1.675%
Unpaid Time Spent Preparing Lessons	1.333%
<u>Administrator Reported Organization Measures</u>	
Using Curricula Aligned with High Standards	11.637%
Using Instructional Strategies Aligned with High Standards	11.654%
Openness to New Ideas and Methods	11.842%
Frequency of Teacher-Parent Conferences	11.586%
Teacher Absenteeism a Problem	11.774%
<u>Student-Level Achievement Measures</u>	
3 rd Grade Reading IRT Score	1.128%
3 rd Grade Math IRT Score	.684%

Table A2.
Weighted Means for Student, School, and District-Level Control Variables

	Overall Mean	No Charter Competition Available (N=1,342 students)	Charter Competition Available (N=4,510 students)
<u>Student Controls</u>			
1 st Grade Reading Score	67.725	68.025	67.636
1 st Grade Math Score	54.996	55.290	54.910
White	.622	.721	.593
Black	.134	.103	.142
Latino	.183	.125	.200
Asian	.033	.020	.037
Other	.028	.032	.027
SES	-.078	-.078	-.078
Gender	.495	.496	.495
<u>School Controls</u>			
% Students on Free Lunch & Reduced Lunch	42.479	40.221	43.142
% White	62.045	72.160	59.075
School Size	528.671	466.475	546.932
Northeast	.202	.200	.200
Midwest	.267	.333	.248
West	.222	.083	.263
South	.309	.3384	.286
Urban	.300	.290	.303
Suburban	.414	.340	.435
Town/Rural	.286	.370	.262
<u>District Controls</u>			
District Enrollment	47322.690	24961.780	53888.040
Per Pupil Expenditures	9246.377	9109.614	9286.532

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Volume 21 Number 88 December 9th, 2013 ISSN 1068-2341



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