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Entrepreneurial Ambitions in the Public Sector: A Random Effects Model of the Emergence of Charter Schools in North Carolina

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Abstract

In this article, I study charter schools as social innovations within the population of established public educational institutions. I begin by briefly outlining the history of public schools in the United States. I apply organizational theories to explain the perpetuation of the structure of public schools since World War II. Next, I delineate the characteristics of educational reform movements in the United States by focusing on the charter school movement. Then, I use an evolutionary approach to study the environmental characteristics that drive the perceived need for innovation and the promotion of experimentation. Using data compiled from the North Carolina Department of Public Instruction, the Census Bureau, and North Carolina State Data Center, I examine the characteristics of the local environment that promotes the submission of charter school applications in North Carolina over a three-year period—1996-1998. I show that school districts in need of school choice do have a higher mean charter school submission rate. I also show that some community characteristics and available resources are important for the initial stage of charter school formation.

Introduction

Charter schools represent a new organizational form in the public school system. They are founded by teams of entrepreneurs that may include students, parents, educators, and community

members. Instead of being part of the established bureaucratic structure, charter schools are independent of the rules and regulations of their associated school districts. In return for per-pupil expenditures and a release from some of the required bureaucratic structure, charter schools are held accountable by the state and local community for improved student achievement.

Since the first charter school was founded in Minnesota in 1992, the number of charter schools has grown at an increasing rate. In 1998, thirty-four states have charter school laws and twenty-six states plus the District of Columbia have operating charter schools (Center for Educational Reform 1999). As of October 1998, 1,128 charter schools enrolled more than 250,000 children. These numbers are rising as new charters are accepted within states and as other states pass charter school legislation (Center for Educational Reform 1999).

The development of charter schools is the result of recent entrepreneurial activity and an example of how a new organizational form can arise as a result of a social innovation. In this paper, I study charter schools as an innovation within the population of established public educational institutions. I expect the founding of charter schools to exhibit distinct stages of innovation, creation, and maintenance, in which people have intentions to start a school, actually create a school, and finally, maintain a school. Specifically, I am interested in the environmental context in which these stages of social innovation unfold.

Evolutionary theory argues that organizational change in a population or community occurs as a result of three processes: variation, selection, retention and diffusion (Aldrich 1979). I treat the innovation of charter schools as an instance of a variation. First, variations in the environments can come from intentional or blind variation. Second, the variations must be developed and implemented or selected into the environment. And third, the innovation gains legitimacy and is retained through a struggle for resources. This paper will examine the first of the three phases – intentional creations (or at least attempted creations) of a new organizational form. Thus, the social innovation of charter schools within established educational institutions and structures is my primary concern.

I begin by briefly outlining the history of public schools in the United States. I apply organizational theories such as institutional theory to explain the perpetuation of the structure of public schools since World War II. Next, I delineate the characteristics of the educational reform movement in the United States by focusing on one of the many reform options –the charter school movement. Then, I use an evolutionary approach to study the environmental characteristics that insight community members and drive their perceived need for innovation and the promotion of experimentation.

Using data compiled from the North Carolina Department of Public Instruction, the Census Bureau, and North Carolina State Data Center, I examine the characteristics of the local environment that cause charter school applications to be submitted in North Carolina over a three-year period. The analysis begins in 1996 when the North Carolina Sate Legislature passed the SL-1997-430, which gave parents, teachers, and community members the legal option to publicly educate students through chartered schools. I use a Poisson random effects model to estimate the effects of community characteristics on the number of charter schools submitted for approval.

Traditional Public Schools

The Constitution of the United States does not explicitly say anything about public educational instruction; thus educational institutions fall under the jurisdiction of state and local governments. In the pre-industrial period (1607- 1812) public schools were set up by boards of

education and funded by taxes to educate children, usually poor children.¹ Finally, the Tenth Amendment officially left the responsibility for education to the states, which reaffirmed the tradition of local control. Before World War II, public schools in the United States did not take on a clear institutionalized character, but after the war public schools became the norm (Hill, Pierce, and Guthrie 1997). Over time, public schools gained legitimacy and acceptance alongside private education. In fact, by 1950 a majority of American children attended public schools. More recent numbers show that public schools still educate most children. For example, in 1995, 33.9 million kindergarten through eighth grade children attended public school whereas only 4.427 million attended private schools (Hill 1995; Hill, Pierce and Guthrie 1997; United States Census Bureau 1998).

Public elementary and secondary education has been and still is a politically charged topic. States and local governments want more control of education, at the same time as the state and federal governments are ridiculed for not supporting education enough. As late as 1979, in response to the growing push for federal intervention, the 96th Congress passed Public law 96-88 that established a Department of Education. The Department of Education was instituted as a federal office to support more effective state and local educational institutions while still allowing state and local governments to maintain control of education. In fact, PL 96-88 clearly stated that the responsibility of education should remain in the hands of state and local systems.² State and local boards of education determine curriculum, testing, and teaching in traditional public elementary and secondary schools, while the federal government provides special programs and funds to enhance and aid state controlled education.

Notwithstanding the freedom state boards of education have to create educational institutions and structures, public elementary and secondary schools have a remarkable resemblance to one other within and across state lines. Schools in Iowa have curriculum, structure, and schedule, similar to the schools in Maine. In fact, children can easily be moved from one state to the next because public education is so similar. The similarity between and within states can be explained if we consider schools an organizational form. Some organizational theories can explain the forces that produce similarities within a population, other organizational theories can explain why there are different organizational structures within the same population.

Schools as Organizations

There are a plethora of definitions for organizations in the literature. However, in my analysis I will use the following definition: "Organizations are goal-directed, boundary-maintaining activity systems" (Aldrich 1979; Aldrich 1999). I have chosen this definition because it is broad enough to encompass public sector, non-business organizations such as schools. In addition, the core of this definition focuses on the social processes, initiation, and endurance of organizations. Thus, Aldrich's definition of organizations allows me to view schools, specifically charter schools, as organizations and focus on the process of their formation. I briefly explain the forces that produce similarity in organizational structures and then discuss the evolution of change via the educational reform movement and school choice.

¹ At the same time, religious schools continued to educate many of the children between the ages of 5 and 17. In addition, exclusive private schools were formed by the upper class to separate privileged children from the lower and middle class or, for that matter, the children of the Nouveau riche (Levine 1980).

² The Constitution only specifies that public education must comply with the separation of church and state.

Forces that Explain School Similarity

Institutional theory explains a great deal about the similarity among public schools (Meyer, Scott, and Deal 1977). The system of public schools in the US maintains its legitimacy by conforming to an agreed upon set of rules and cultural expectations (Meyer and Rowan 1977; Meyer and Rowan 1978). Despite the variations in laws, schools almost universally educate children in similar subjects and similar ways, partly because of teachers' and administrators' sensitivity to public opinion (Bidwell 1965). That is, the school as an organization faces formal pressures from state and local boards, informal pressures from parents and the community, and cultural expectations. Thus schools are "highly penetrated organizations," sensitive to the environment (Meyer, Scott and Deal 1977).

In organizational terms, schools are isomorphic, or constrained to resemble one another, due to the similar set of environmental conditions they encounter (DiMaggio and Powell 1983). Schools do not, however, face competitive isomorphism because they are not in a population of "free and open competition" (DiMaggio and Powell 1983; Hannan and Freeman 1977). Traditional public schools face institutional isomorphism. In other words, schools fight to gain legitimacy for social acceptance. DiMaggio and Powell (1983) discussed three ways in which an organization undergoes isomorphism – coercive, normative, and mimetic. First, organizational leaders are coercively isomorphic because the organization needs to be political and social legitimized. Thus, an organization needs to follow both social and political norms. Second, normative isomorphism is related to professionalization and professional norms. That is, norms related to the development of the occupations that fill the organization. Finally, mimetic isomorphism is a result of uncertainty (see DiMaggio and Powell 1983). I believe that coercive and normative mechanisms constrain the schools from deviating from the norm.³

Generally, coercive isomorphism results from formal and informal political and social pressures on schools to meet cultural expectations (DiMaggio and Powell 1983). Meyer and Rowan (1977) argued that organizations, which expand their presence in more than one social arena, increase their legitimacy by conforming to and creating institutionalized norms. State legislation, national test standards, and requirements for funding have helped perpetuate school systems and school structure. Educational institutions and their teachings enter students' and parents' lives through political debate, family issues, and socialization. Public education has been socially constructed to reflect the mainstream values and needs of students, parents, citizens, and teachers (Berger and Luckman 1966).

Normative isomorphism is also an important factor in the perpetuation of the structure of public schools in the United States. Normative isomorphism stems from professional pressures on schools to conform to standards. Schools are created and run by people who have been selected from a larger population, formally educated, professionally socialized, and in many cases made official members of unions American Federation of Teachers (AFT) and professional organizations such as the National Education Association (NEA). Teachers are semi-professionals⁴ who are subject to normative pressures. Teacher colleges and teacher certification programs formally educate teachers. In their education, teachers are taught how to teach, what to teach, and how to behave professionally. In fact, students in schools of education have an apprentice-like program – student teaching – that gives them experience and time in a classroom. It is in the classroom that teachers learn professional standards and are expected to conform to them. For example, teacher

³ Mimetic mechanisms are probably not the cause of isomorphism in the school population because uncertainty is rare.

⁴ The professional status of teachers has been debated; nevertheless, teacher colleges and unions are at the very least fighting for the professionalization of the occupation.

colleges in New Jersey can prepare students to be teachers in any state. Therefore, professional standards created by teaching colleges and other associations perpetuate the structure of educational institutions and enhance similarity among schools across school systems. In sum, institutional norms and expectations have created traditional education in the US. Political structure, values, and professional norms play a part in creating public schools as we know them.

Furthermore, due to standardized norms and expectations, traditional schools are designed to serve the needs of the average child. Yet there are many children that do not fit the mold. Traditional schools often fail to meet the needs of students. However, every child must attend schools despite the goodness of fit between the student and the school. The only other option for students is private school, and most parents cannot afford private or religious schools. And thus, until recently, those children who could not afford alternatives to public education were stuck in traditional schools regardless of the school's ability to teach them. In the next section, I will use an evolutionary approach as applied to organizations to explain the reform movement in education. A caveat to keep in mind is that most of the work done on new organizational foundings and nascent entrepreneurship focuses on business organizations rather than public sector organizations. Nevertheless, I believe many of the same processes work for the evolution of the public sector.

Evolution of Schools

Because I am interested in the genesis of a new organizational form within the population of public schools, I must use a theoretical framework that is general enough to aid the understanding of social innovation. Institutional theory alone is not equipped to explain the recent changes in the educational system.⁵ Institutional arguments are static; therefore, the theories they provide are not sufficient to explain the change in the nation's education system. Evolutionary theory, on the other hand, is a broad multi-dimensional theory that is most similar to ecology but uses principles from institutional theory, learning theory, cognitive theory, transaction cost economics, and resource dependence to explain changes in a population (Aldrich 1999). The theory directs our attention to the processes that produce patterned changes in a population (Aldrich 1999).

Organizational ecological models help answer "why there are so many different kinds of organizations" (Hannan and Freeman 1977). Until recently, researchers studying the public school system in the United States need not grapple with that question because most schools structures looked similar to one another. However, today with the emergence of "new" public educational structures, population ecology, and even more broadly evolutionary theory, is needed to help us understand why these new forms were created.

Changes in the population of schools can occur for various reasons. Research on foundings shows that a need for a change may be the impetus for an innovation but is not sufficient or even necessary. For example, a school district may be falling behind national and state averages (their students are below the national or state average on standardized tests or are below grade level in math and reading), and yet an educational innovation never happens. On the other hand, school districts that produce above grade level students with above average and excellent test scores may produce many educational reforms. Although, the need for change may be an important part of the social innovation process, it can not explain all of it. Instead, social entrepreneurs are a key to the production of an innovation. Environments and communities may "breed" these entrepreneurs. Thus, the effects of community context are key to understanding social innovation in the public school system. I will model some of these community characteristics to predict social innovation.

⁵ Institutional theories can explain why the diffusion process is slow for educational reform in curriculum and organizational development, but the diffusion process is beyond the scope of this paper. For more information about the diffusion (Mort 1958; Owens 1981: p. 237-249).

Educational Reform

The educational reform movement focuses on school choice. Since the establishment of common schools in the mid-1800's, local or state boards of education have assigned children to schools. Thus, children were bound to a school by their geographical location. In contrast, the movement for school choice advocates free, public options for parents to send their children to schools other than those to which they are assigned. Alternative schools provide a choice in the public school sector rarely available before the reform movement.⁶

The current school reform project has changed the nature and structure of public schools. Alternative schools are deliberate departures from the existing public educational form. Four major choice ideas have been experimented with in states around the country – magnet, voucher, contract, and charter schools. I briefly define the first three school choices and then spend the majority of time explaining charter schools.

Magnet schools allow students to go to a different public school than the one to which they are assigned. They typically have entrance exams (Nathan 1996). Vouchers are education “gift certificates” that allow children to use the money allocated to them for public schools, i.e. per-pupil expenditure, to go toward their schooling at a private institution. Vouchers have been rather controversial because public funds are often used for non-secular schools (see Nathan 1996). Contract schools or school site management delegates the administrative and financial responsibilities of a school to a firm rather than the local government. In other words, business organizations are contracted by the local educational agency to run a school. Again, this option is controversial because for-profit organizations run the school and may have conflicts of interest between their profits and the well-being of the school.

Charter Schools

Charter schools represent an innovation in the population of education systems in the public sector. Their organization differs from a traditional public school, and their place in the district structure of education is different. Charter schools are public schools that break off from the school district's command, and yet they are still public schools. Charter schools do not need to comply with all of the district rules, and thus the bureaucracy usually associated with public education is reduced. In return, charters schools' missions and statements explicitly state that parents, teachers, and students will increase their participation in school-related activities (Bomotti, Ginsberg, and Cobb 1999; Nathan 1996). In addition, charter schools must be accountable for student achievement or they can be closed. Charter schools give freedom to teachers to use innovative techniques and to administrators to structure the school day to best suit the students they serve. Like other public schools, the only federal regulation with which charter schools must comply is that they must be non-sectarian and may not charge tuition (Koppich 1997). Other regulations vary by state. For example, most states limit the number of charter schools that can be created, the number of non-certified teachers that can be hired, and the form of governance the schools can adopt. Nevertheless, the charter itself dictates the mission, curriculum, and population of the school. Thus, charter schools are public institutions, but they differ in many ways from traditional public schools.

Charters are funded by state allotment for each student, but lack the capital that public schools get from the state and local community. When families place their child in a charter school, the state and local funds allotted to that child are moved from the traditional public school and given to the charter school. It is easiest to picture children sitting in a classroom with dollar signs over their heads. When they move from a traditional public school to a charter school the dollar

⁶ Private, and religious schools also provide variations in educational institutions but not in the public realm. New York's magnet schools are also an example of an educational choice but competitive based on entrance exams.

sign moves with them, but the desk and building they were sitting in not. In other words, the only money each child gets is the dollar amount assigned to the individual, but not the capital used to build the traditional school.

Funding is probably the most debated and controversial issue of charter schools. Per-pupil expenditure pays for teachers, books, and supplies. Opponents of charter schools argue that losing one child to a charter school means the loss of between 3 to 5 thousand dollars, but fixed costs for the public school, such as the number of teachers or their salary, remain the same. Thus, reallocating per-pupil expenditures to go to charter schools rather than the fixed costs in the traditional public school will hurt public schools systems (Koppich 1997). In fact, opponents in Ohio, Illinois, and Oregon have used this argument to defeat charter school legislation (Marks 1998).

However, researchers in North Carolina have shown that the negative financial consequences incurred by districts are overstated. First, very few students per district leave the traditional public schools (Hassel 1998). Thus, the financial burden is minimal for most districts. Second, districts can contract services to charter schools for fees to recoup some of the money they lost to charter schools. In other words, some of the per-pupil expenditures lost to charter schools can be gained back through contracting educational and transportation services (Coulson 1996). Finally, the financial loss felt by districts may be an added incentive for traditional public schools to improve their accountability to families. In fact, charter school advocates intended for charter schools to create competition for students and decrease the degree of monopoly traditional public school have over education (Hassel 1998). In the aggregate, charter schools receive less than what traditional public schools receive from public funds and do not put a great burden on their feeding school district⁷ (Hassel 1998). Some even go as far as to say that charter schools do not receive their “fair share” of public funds for a public schooling (Hassel 1998).

Charter Schools and Small Businesses

Business organizations and charters schools exhibit an important similarity. The similarity is important for understanding charter schools via organizational theories and using an evolutionary approach. Both charter schools and businesses must show gains. Like all organizations, a charter school must define and meet its goals to succeed and survive. Achievement gains in a charter school are equivalent to profit gains in a business. Charter schools must be accountable for student achievement. If they fail to do so, a charter school will lose its charter just as if a business fails to meet its profit goals it will fail. In addition, charter schools, like businesses must stay out of debt. For example, in Chapel Hill/Carborro North Carolina, a charter school closed mid-year early in 1999 because of a \$50,000 debt they could not repay. Charter schools and businesses alike cannot run in the red and survive.

But charter schools are not like small business in many significant ways. Charter schools must comply with state regulation and criteria. For example, if a group of people want to start a charter school, they must first write an application and submit it to either the local educational agency or the state board of education for preliminary approval.⁸ Once the charter obtains preliminary approval, it is then sent to the State Board for final approval. If the charter is not approved, many states have an appeal process. In any case, the State Board reviews the charters to make sure they match the criteria laid out by the state legislation.

⁷ The data for financial burden come from an analysis of funding in North Carolina. Depending on state law, some states may find more or less burden to their districts.

⁸ This varies state by state. In North Carolina, charter applications may be sent to either the LEA or the state for preliminary approval.

A small business does not go through such an application process. Under most circumstances, almost anyone can open a business without approval from the state or local government. Furthermore, after a given period of time, the state board reviews the existing charter schools. Small businesses are not subject to official review. Finally there is a difference in the number of organizations legally allowed to form. State regulations limit the competition for charter schools, while other business organizations are in a more or less free and open market competition. Most states have a limit on the number of charter schools. For example, North Carolina has a cap of 100 schools but Mississippi has a cap of 6 charters. However, the Department of Commerce does not limit the number of donut shops or delis allowed to open in a state. Thus the survival of a charter school depends less on the density of the population of charter schools than does the survival of business organizations and so I expect different factors to affect schools than businesses such as community involvement (see Hannan and Freeman 1989 for a complete discussion of density dependence).

Charter Schools as a Variation in the Population of Public Educational Institutions

Variations occur as responses to need, resource availability and mobilization when people actively attempt to generate alternatives to existing forms. Variations are important for creating competition, an implicit part of the evolution of organizations. They are also important because variations help generate differences within a population.

Charter schools are intentional variations that arise from innovative and experimental groups of initiators often to solve the problem of complacent and monopolistic schools (Coulson 1996). Public schools have had an almost complete exclusive jurisdiction of the education of American youth (besides religious and private schools) and thus the population of schools has had very little variation and competition (Scott 1992). In fact, traditional public education meant that a school would be run by the local board where choice in education meant that one would have to pay tuition to a private institution (Hill 1995; Hill, Pierce and Guthrie 1997). Because state and local government had a monopoly on education, public elementary and secondary schools did not have to be accountable for growth and gains in student achievement.

However, state and local governments, those who have monopolistic control over education, are the only ones who can make school choice a legal option. Thus, the system, rather than the environment, controls innovations in education at large. In fact, the initiation of the variation can only occur in states where the legislature has passed a charter school law. Someone must bring an initial bill to the state legislature. These policy entrepreneurs (Mintron 1997) help create a formal arena for educational entrepreneurs to experiment with a new educational form. Without the law, variations in public education are impossible.

Charter Schools in North Carolina

North Carolina passed legislation in 1996, five years after Minnesota passed the first charter school law, that allows public funds to go to charter schools. According to The Center for Educational Reform, North Carolina has a strong charter school law (see Appendix I for details of North Carolina Charter School regulations). "A strong law (also known as a "live," "effective," "expansive" or "progressive" law) is one that fosters the development of numerous, genuinely independent charter schools" (Center for Educational Reform 1999).

North Carolina had 63 operating charter schools as of November 1998. The schools are located in rural areas in the western counties, cities such as Raleigh and Charlotte, and affluent villages such as Chapel Hill/Carrboro. The schools serve a range of students including average students, at risk students, special needs children, and exceptional children among other populations. Controversy exists over the quality of education found in charter schools, the populations they serve, the number of students they teach, and the teachers teaching them, (for example Jackson 1998).

Data

The data for this analysis come from several sources. First, I collected the population of submitted charter school applications to the North Carolina State Board over a three-year period from the first legal year of charter schools in 1996 to 1998. These data will be used to create the dependent variable in the analysis: number of submissions of charter school applications to the State Board of Education. These data are from the Department of Public Instruction – Office of Charter Schools Recommendations for Preliminary and Final Approval summary reports. There were 184 charters submitted between 1996 and 1998, of which 66 were accepted.⁹ I was able to obtain the year the charter was submitted, acceptance status, grade level, county or local educational agency in which the school would be located, and charter type. For this analysis, I will only use the county and year for which the charter was submitted.

The second source of data is from the 1996 USA Counties DataBase (from Census Bureau) and North Carolina State Data Center (SDC). The USA Counties DataBase is a conglomeration of data compiled from the 1990 census and Current Population Surveys (1992-1995). SDC is a consortium of state and local agencies that provides data and information about North Carolina. I use the 1995 data. Because local educational agencies or LEAs¹⁰ and counties have an almost 1 to 1 correspondence in North Carolina¹¹, I can use information about LEA and counties as contextual-level variables.

Finally, the third source of data comes from NC Department of Public Instruction. In 1997, NC implemented the ABC's, a program to monitor all public schools in North Carolina, in accordance with the School-Based Management and Accountability Act (1996).¹² School growth and performance is measured by composite scores computed for expected growth/gain, exemplary growth/gain, and a percentage of students at or above grade level. Excellent, distinguished, progressing and low performing schools are identified based on the composite scores.

The data are in a stacked or LEA-year format. In other words, each of the 118 LEAs have 3 observations, one corresponding to 1996, one to 1997, and one to 1998. Therefore, I have 354 observations of LEA years. I then use a year dummy variable to capture period effects. However, the other independent variables for the county characteristics of the LEAs are time invariant. In other words, I continue to use the same values of the independent variables over time. I use lagged county data (community characteristics prior to 1996) to reflect the county atmosphere prior to submission of a charter school application.

Hypotheses

I have three main hypotheses regarding the effect of the environment on charter school application submissions.

Sources of Dissatisfaction: Charters are educational options. If schools in a district are meeting the public expectations for educating its student body, the need for school choice may be attenuated. Conversely, those districts that are not meeting the educational expectations of parents, teachers, and administrators may generate increased dissatisfaction with public schools. Therefore, I expect that quality of LEA schools will be inversely related to the number of charter school submissions because people will respond to their dissatisfaction. In addition, LEAs with few school-age children as a proportion of the total residence will be less likely to need charter schools. For

⁹ Three of the 66 accepted schools were closed sometime after operation.

¹⁰ Local Educational Agency, school system, and school district are all synonymous.

¹¹ There are 100 counties and 118 Local Educational Agencies in NC.

¹² The results are publicly available and can be found in "A Report Card for the ABCs of Public Education, Volume I."

example, charter schools are often aimed at special needs children. The number of special needs children in LEAs with relatively few school-age children will be fewer than in LEAs with a greater proportion of school-aged children.

H1: LEAs that have a higher percentage of low performing schools will have a greater number of submitted charter school applications.

H1a: LEAs with a smaller proportion of school age children will have fewer submitted charter school applications.

Resources: School funding is an important part of the charter school application process. Those people who submit an application must show that the charter is financially viable. According to the state law, charter schools receive state and local per-pupil expenditures for each student that attends the school but do not receive capital or startup funds. Therefore, the more per-pupil funding, the easier it may be to start and maintain a school and thus the more likely one would be to submit an application.

H2: The greater the state and local per-pupil expenditure in an LEA, the greater the number of submitted charter school applications.

Characteristics that promote experimentation: The community characteristics may have a positive or negative effect on charter school submissions. For example, as stated above, strong institutional norms may inhibit experimentation and social innovation. These norms may be produced by coercive, normative, or mimetic isomorphism. Therefore, the extent to which a community has institutional norms may inhibit or enable social innovation.

Despite the possible institutional constraints on social innovation, new organizations even in the nascent stages need founders. The need for a new form is not sufficient to understand the solutions (Aldrich 1999). Therefore, information about the types and groups of people in a community may be helpful to understand who starts a new form. Active and innovative groups are likely to see a need and act on it to create a new charter school. Therefore, I include information about the political environment as an indicator of the activity of people in the community. In addition to the voter population, the political affiliations of voters may be important. Although nation wide both Democrats and Republicans have supported charter schools, Democrats seem more likely to support educational initiatives such as charter schools. Therefore, counties that are more Democratic will be more likely to start a charter school.

Furthermore, having a college degree is a personal characteristic that may increase the likelihood that a person would initiate a charter school. College educated parents may be more active in their children's education, question educational practices, and have the skills to start a new educational form.

H3a: The greater proportion of registered voters, the more likely there will be a greater number of submitted charter school applications.

H3b: The greater proportion of voters who are Democratic, the more likely there will be a greater number of submitted charter school applications.

H3c: The greater proportion of college educated people in the county the more likely there will be a greater number of submitted charter school applications.

Variables

Dependent Variable: Number of submitted charter school applications.

I use the number of applications rather than the number of accepted charters to avoid testing the political structure of the approval process. I am interested in the effects of the environment on the decision to initiate a new educational form in a LEA. Figure 1 shows an approximate Poisson distribution of the percent of LEA's applications submitted to the state from 1996 to 1998. A LEA may have submitted an application in 1996 but not in 1998. Therefore, the percentage of LEAs is not mutually exclusive from one year to the next. There were 57 local educational agencies (49 percent of the 118 LEAs) that never submitted a charter school application between the years of 1996 and 1998.

Figure 1: Percent of LEAs with Charter School Application Submissions by Year

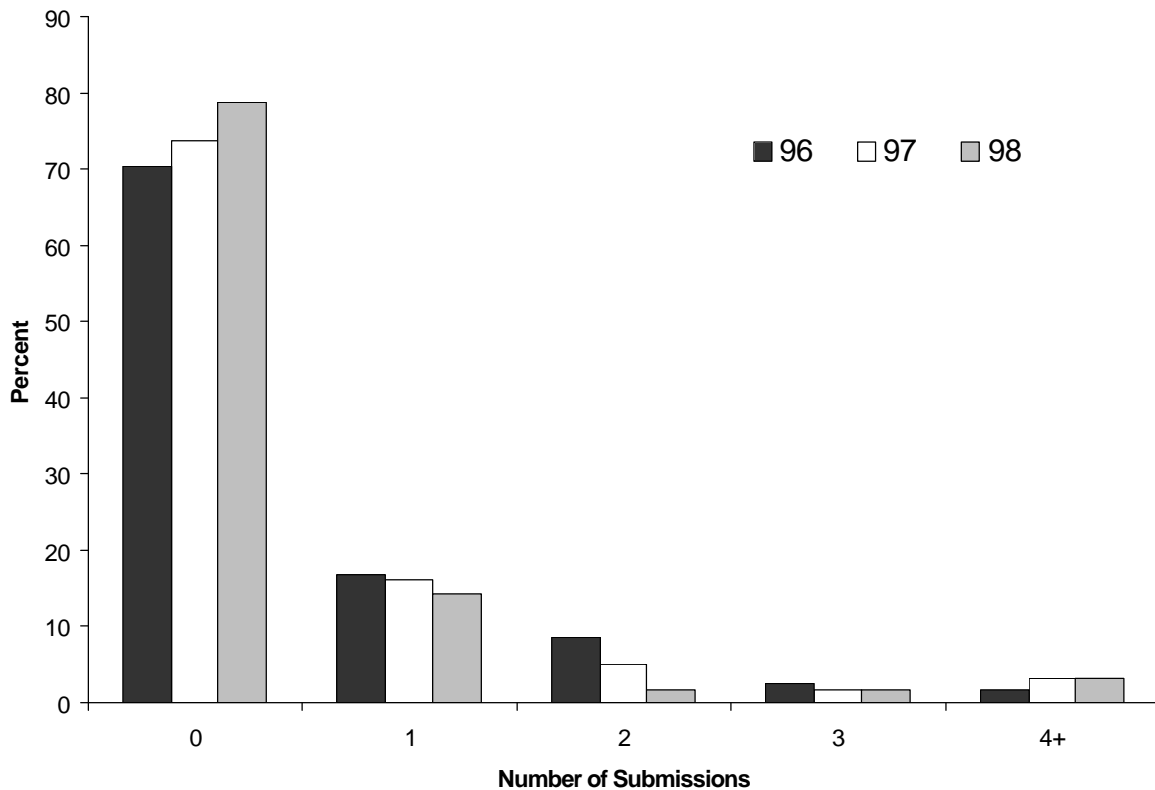


Table 1
Independent Variables

Year (for period effect)	Dummy for 1996, 1997, 1998. (1996 = reference category)
LEA Public Schools:	Based on the ABC's 1996-1997
High Performing schools:	A ratio of the number of schools identified by the state as being a school of distinction or excellence over the number of public schools in the LEA. Schools of distinction meet their expected growth or have at least 80 percent of their students performing at or above grade level. An excellence school has at least 90 percent of their students performing at or above grade level. (range 0 to 100 percent of the schools in the LEA)
Low Performing Schools	The number of schools that fail to meet their expected growth or have less than 50 percent of the students perform at or above grade level over the number of schools in the LEA. (range 0 to 100 percent of the schools in the LEA)
School aged children	Proportion of school aged children in the county, 1995 (age 5-18)
Characteristics to Promote Experimentation:	
Voter registration	The proportion of people (16+) registered to vote, 1995
Political affiliation	The proportion of registered voters who are Democrats, 1995
percent College Graduates	The proportion of people in the county who are have received a college degree, 1990
Funding	
State Per-pupil expenditure	The dollar amount of money allotted to each child in the LEA by the state divided by 100 in 1996
Controls:	
Demographic Indicators	
Racial composition of the county	Proportion white in the county, 1995
Density per square mile	Proxy for rural or urban area is the number of people per square mile in the county, 1995.
Unemployment Rate:	The unemployment rate in the county in 1994.
Per capita income	Per capita income in 1995

Control variables

I have included variables to control several other community characteristics. Many charter schools are found in cities rather than small affluent suburbs (though exceptions exist), therefore, I control for density, unemployment, per capita income, and racial composition as urban proxies.

Method and Model

The Poisson Model

Count data are discrete, non-negative integers that enumerate the number of events. Count dependent variables cannot be treated as continuous in a linear regression model or as binary in a

logit model because the estimates will be inefficient, inconsistent, and biased (Long 1997). A linear OLS model will not produce reliable estimates because the count variable does not have a normal distribution. The log of a count variable cannot correct the problem because the log of a zero value is undefined. Therefore, we need a count model to estimate the effects of an environment on the number of events occurring.

Count models can correct for the problems of the OLS by transforming the dependent variable. The Poisson regression model (PRM) determines the probability of the count of the event occurring by using the Poisson distribution. Poisson is the simplest of the count models due to the properties of the probability density function $f(x) = \lambda^x e^{-\lambda} / x!$ but it is also restrictive. One of the assumptions of the PRM is that the dependent variable's mean and variance are equal. Thus, the distribution assumes that the event count is time independent where the conditional mean of the error is 0 and the errors are heteroscedastic since $\text{var}(e|x) = E(y|x)$. In my data, the mean is .5 and the variance is 1.7 thus the data are not distributed in an exact poisson distribution.

Random Intercept model

A simple Poisson model is not appropriate for correlated data. In such instances, the maximum likelihood estimation of a Poisson model will result in biased and inconsistent estimates. Because of the longitudinal data structure in this analysis and the use of time invariant covariates, the most appropriate model is the random effects model for a count dependent variable. The data for this analysis are clustered by school systems over three years. To correct for the clustering and account for the distribution of the dependent variable a Count Random Effects Model is most appropriate.¹³ The "xtgee" command in *Stata*¹⁴ can estimate a Poisson Random Intercept model that corrects for over-dispersed dependent variables.

Results

The exploratory analysis of the dependent variable is shown in Table 2. As shown, the mean number of submissions per LEA per year is .5 with a variance of 1.7. The correlations between the other independent variables are all below .6. The number of submissions is correlated with the independent variables (results not shown here). The significant correlations gave me enough confidence to proceed with the multivariate PREM.

¹³ A suitable model would be a negative binomial REM to account for the over-dispersion in the dependent variable. In other words, the variance is not equal to the mean and thus the dependent variable actually has a negative binomial distribution. Using a negative binomial model would relax the assumption of an equal mean and variance of the Poisson distribution.

¹⁴ Copyright 1999. Stata Corporation, College Station, Texas.

Table 2: Poisson Random Effects Model of Number of Submitted Charter School Applications

Variables	Coef.	Std. Err.	Odds Ratio
Intercept	4.9300	2.60	--
YEAR			
1997	0.0000	0.18	1.000
1998	-0.2231	0.18	0.800
NEED (Hypothesis 1)			
% Low Performing LEA Schools	7.2200 +++	2.26	1336.440
% High Performing LEA Schools	-0.0186	0.18	0.982
% School Age	-1.6124	6.17	0.199
RESOURCES (Hypothesis 2)			
State funding 96	-0.1600 +++	0.05	0.850
EXPERIMENTERS (Hypothesis 3)			
% Registered to Vote	-2.7795 +	1.50	0.062
Democrat	0.0012 ^	0.00	1.001
% College Grad	5.9474 +++	1.78	382.739
CONTROLS			
Unemployment Rate	0.1149	0.09	1.122
Density per Sq. Mile	0.0001	0.00	1.000
Per capita Income	0.0001	0.00	1.000
% white	-0.1823	0.69	0.833
ICC or Rho		0.106	
chi2(df=15)		280.37 ***	
Number of observations		354	
Number of Clusters		118	
Number of obs per cluster		3	

+p< .05, ++p< .01, +++p<.001, one-tailed test

^p<.1, *p<.05, **p< .01, ***p<.001, two-tailed test

I ran a series of nested models, systematically including each set of independent variables. By comparing the chi-squares and degrees of freedom, I choose the most restrictive model as the final model. The results of the nested models are not shown here.

Effects of environment on submission

As I predicted in hypothesis 1, a greater proportion of low performing schools does increase the mean number of charter school applications. As shown in Table 2, a 1 percent increase in low performing schools in the LEA increases the mean number of submissions by 134 percent. Hypothesis 2 was not supported. The direction of the effect of state funding is negative but not significant. Surprisingly, a 100 dollar increase in state funding decreases the mean number of submissions by 15 percent. One explanation for reversal in the predicted direction is that school districts that are getting more state money may be better off than those districts with less money and thus do not need school choice. This finding would be in direct contradiction to The Coleman study (1966) but may support educators such as Kozol who believe that the inequality in per-pupil

expenditures does inhibit learning and performance for some students (Kozol 1991). Further research should explore the causes and consequences of per-pupil expenditures on school performance and alternative schooling.

I show some support for the third set of hypotheses that environmental characteristics promote experimentation through active groups of people. An increased proportion of registered voters actually decreased the mean number of submission in a county. The variable I use for voters may be too passive a measure to capture the activity of community members. Voter registration does not necessarily mean that people are actually voting. I have used this measure but the reversed sign indicates to me that a better measure, such as voter turnout, would be more appropriate. Counties that have a greater proportion who are Democratic voters have more submitted charter school applications over the three years in North Carolina. For ten percent increase in proportion of Democratic affiliated voters there is a 1.2 percent increase in the mean number of submitted applications net of all other variables. In addition, a one- percent increase in the proportion of college grads in a county increases the mean number of submissions by 38 percent. The effect is so large due to the distribution of the variable. A transformation of the variable such as taking the natural log may help reduce the effect but transformations make interpretation more difficult to interpret intuitively.

In sum, counties with more democrats and college educated people and a greater percent of low performing schools will tend to have more submitted charter school applications. Further research should examine the characteristics of the individuals who initiate charter schools in their communities. It is interesting that the control variables I specified did not have a significant effect on the submission of charter school applications. Thus the racial composition, unemployment, and density of an area do not encourage or dissuade charter school development. This may be an area for further research.

Conclusion

This paper analyzed the first part of the process of creating a new organizational form. I was able to use the environmental context to explain what types of communities are most likely to initiate a new educational form. I have shown that LEAs in need of school choice (defined by the percentage of low performing schools) in fact do have a higher mean submission rate. I have also shown that some characteristics about the community and available resources are important for the initial stage of charter school formation.

This analysis has shown that the environment is an important factor in predicting nascent school foundings. It is the first step in our understanding of charter schools as a new educational organizational form. I would like to use more direct measures of community and professional activity to test the assumption that certain groups will be social entrepreneurs that initiate new organizational forms. Thus, information about the entrepreneurs and the resources they access will further illuminate our understanding of charter schools as a new organizational form.

There is now evidence that school districts that fail to meet high performance standards have a higher mean charter school submission rate than districts that have high student outcomes. This suggests that charter schools are being developed in areas where there is a perceived need for them. The question remains if the students who attend charter schools are the underserved in those districts, which would include students at-risk and students of color. Recent studies in Arizona have shown that charter schools, in fact, do more to segregate districts and schools than to integrate them (Cobb and Glass 1999). Do my findings here about the initiation of charter schools and the findings about charter school racial composition suggest that charter schools are being used as a means of white flight without residential mobility?

I also found that some community characteristics and available resources are important for the initial stage of charter school formation. My research suggests that policy makers interested in encouraging charter school formation should provide financial resources to nascent founders for their endeavors but should also ensure that all students get a chance at attending charter schools.

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Linda A. Renzulli is an Assistant Professor in sociology. Her research interests include organizations and education. She is currently working on a several charter school projects including racial composition of teachers in charter schools and the initiation of charter school legislation and charter schools across the United States.

Appendix I

Charter School Legislation: Profile of North Carolina's Charter School Law North Carolina Law passed 1996, amended 1997.

Number of Schools Allowed	100 (maximum 5 per district per year)
Number of Charters Operating	59
Additional Schools Approved (Oct 1998)	5
Approval Process Eligible Chartering Authorities	Local school boards, state board of education, University of North Carolina institution, local board and UNC approval subject to final approval by state board
Eligible Applicants	Person, group of persons, or non-profit Corporation
Types of Charter Schools	Converted public and private, new starts (but not home-based schools)
Appeals Process	Charter denied by local school board or UNC institution may be appealed to state board of education
Formal Evidence of Local Support Required	For conversions, majority of teachers and uncertified staff at school must support; evidence that a significant number of parents support conversion must also be provided; districts must provide and sponsors must consider impact statement
Recipient of Charter	Applicant
Term of Initial Charter	Up to 5 years
Automatic Waiver from Most State and District Education Laws	Yes from state laws; yes from district regulations except for local-board-sponsored charters, which must negotiate with sponsor district for waivers from district rules
Legal Autonomy Governance	Yes
Charter School Governing Body Subject to Open Meeting Laws	Specified in charter
Charter School May be Managed or Operated by a For-Profit Organization	Yes
Transportation for Students	Charters may not be granted directly to for-profit organizations, but charter schools may contract with for-profit organizations to run the school
Facilities Assistance	Charter schools must provide same transportation assistance as district public schools
Technical Assistance	Districts required to lease available public space to charters so long as it is "economically viable;" charters may lease space from sectarian organizations so long as sectarian symbols are removed
Technical Assistance	Department of education must provide technical assistance to charter school applicants upon request

Reporting Requirements	Charter school must comply with reporting requirements established by state board of education in the Uniform Education Reporting System; charter school must prepare annual report for chartering authority and state board; state board must prepare annual report on academic progress, best practices, and effect of charter schools on districts for legislature
Funding Amount	100 percent of state and district operations funding follows students, based on average district per-pupil revenue; special needs funding also follows the student
Path	State funds flow directly to charter school; local funds pass through district to charter school
Fiscal Autonomy	Yes
Start-up Funds	No state funding; federal charter school funding will be applied to start-up costs
Teachers	
Collective Bargaining / District Work Rules	For charter school sponsored by local school board teachers remain subject to district work rules unless they negotiate to work independently; for all other charter schools, teachers are not subject to district work rules (North Carolina is a right-to-work state)
Certification	25 percent of teachers in elementary charter schools and 50 percent in secondary charter schools may be uncertified
Leave of Absence from District	Up to 6 years
Retirement Benefits	Teachers qualify for state retirement plan during leave of absence from district; state has defined charter employees as public employees and has asked the IRS for a formal ruling on providing retirement benefits to teachers not on leave from a district
Students	
Eligible Students	All students in state
Preference for Enrollment	Children of charter's professional staff; in a charter's first year of operation the lesser of 10 percent or 20 slots may be reserved for children of founding board members; for public conversions, students in attendance area of former public school (for private conversions, students attending the school prior to conversion may not receive preference)
Enrollment Requirements	Not permitted
Selection Method (in case of over-enrollment)	Lottery
At-Risk Provisions	Preference in the approval process is given to charter schools designed to serve at-risk students

Racial Balance Provisions	After one year, charter school must reasonably reflect racial balance of district (or, if serving special population, must resemble the balance of that population in the district)
Mandated Assessments	Student assessments required by state board of Education
Other Features	
School Size	Charter schools must have a minimum number of students (65) and teachers (3), though exceptions are allowed; may increase by 10 percent without additional approval from sponsor
Termination of Charter	If two thirds of teachers and support staff request, charter may be terminated

Source: The Center for Education Reform – (Fall, 1998
<http://edreform.com/laws/NorthCarolina.htm>)

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