

EXAMINING A DECADE OF READING AND MATHEMATICS STUDENT
ACHIEVEMENT AMONG PRIMARY AND SECONDARY TRADITIONAL PUBLIC
SCHOOL AND CHARTER SCHOOL STUDENTS:
A META-ANALYTIC INVESTIGATION

by

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Examining a Decade of Reading and Mathematics Student Achievement among Primary
and Secondary Traditional Public School and Charter School Students:

A Meta-analytic Investigation

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ABSTRACT

Over the last decade, the focus on student achievement in America's public schools has dramatically increased. The pressure to perform and show growth in student achievement has been challenging due to increased levels of competition through school choice across the nation. Charter schools are one of the most recent education reform movements designed to increase accountability, innovation, and competition. Since the adoption of the first charter law was passed in Minnesota in 1991, the number of charter schools has grown rapidly across the nation. "Charter schools have recast the definition of public school and have presented the field of education with its greatest challenge" (Murphy & Dunn, 2002, p. 1).

According to the National Alliance for Public Charter Schools, there are currently over 5,000 charter schools that operate in 42 states and the District of Columbia, serving more than 1.6 million students ("Charter schools 101:," 2012). Students across the country have the option to attend charter schools or remain in the home school district.

Parents and students are challenged to make a choice of which educational avenue is best for their family and must weigh all of the advantages and disadvantages to see which may produce the greatest outcomes and meet the needs of a diverse student population.

The current investigation synthesizes numerous studies conducted across the nation at the elementary, middle and high school level. Meta-analytic techniques assist parents and educators in making evidence-based decisions while adding to the research supporting educational reform and promoting best practices in both educational models. This study was specifically designed to consider a number of variables in charter schools relative to traditional public schools, including socioeconomic status, English Language

| An Analysis of Academic Achievement

Learning, school competition, and eligibility for special education that may impact student mathematics and reading achievement. Analysis revealed that charter schools are producing lower achievement scores in reading and mathematics when compared to traditional public schools.

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Dedications

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TABLE OF CONTENTS

Chapter I.....	1
Introduction.....	1
Statement of the Problem: The Need for Change.....	1
Purpose of the Study.....	4
Significance of the Study.....	5
Organization of the Study.....	6
Limitations of the Study.....	6
Definition of Terms.....	7
Chapter II.....	9
The Charter School Concept.....	9
Charter Schools Providing Choice and Opportunity to Students.....	10
Leading the Way: Minnesota Develops Charter School Legislation.....	11
An Era of Accountability.....	12
Competition.....	15
School Choice.....	17
Student Achievement.....	21
Where Are Charter Schools?.....	26
Charter School Demographics.....	26
Who Creates Charter Schools?.....	27
Prior Charter and Traditional Public School Studies.....	28
Mixed Findings.....	29
No Significant Difference.....	30
Charter Achievement Growth Over Time.....	31
Charter Schools Outperforming Traditional Public Schools.....	31
Traditional Public Schools Outperforming Charter School Scores.....	32
Conclusion.....	33
Chapter III.....	36
Data Analytical Method.....	36
Research Questions.....	37
Sample of Studies.....	38
Coding of Studies.....	40
Student Level.....	40
Achievement Measure.....	41
Geographic Region.....	41
Student Socioeconomic Status.....	41
Urban/Rural Educational Setting.....	41

English Language Learning.....	42
Special Education Population.....	42
Competition Effect.....	42
Publication Source.....	43
Publication Year.....	43
Publication Status.....	43
Dependent Variable.....	44
Calculation of Effect Sizes.....	44
Interpretation of Effect Sizes.....	44
Chapter IV.....	46
Results.....	46
Introduction.....	46
Descriptive Analysis of Effect Sizes.....	48
Meta-Analysis Results by Moderator and Levels.....	50
Publication Bias.....	63
Egger's Test of the Intercept.....	63
Summary of Meta-Analysis Results.....	64
Chapter V.....	65
Primary Moderators	67
Secondary Moderators	77
Limitations of the Study	79
Future Research	80
Conclusion	81
APPENDICIES.....	83
References.....	85

CHAPTER I

Introduction

Charter schools are one of the most recent education reform movements designed to increase accountability, innovation, and competition. Since the adoption of the first charter law was passed in Minnesota in 1991, the number of charter schools has grown rapidly across the nation. “Charter schools have recast the definition of public school and have presented the field of education with its greatest challenge” (Murphy & Dunn, 2002, p. 1).

According to the National Alliance for Public Charter Schools, there are currently over 5,000 charter schools open in 42 states and the District of Columbia, serving more than 1.6 million students.

As charter schools continue to proliferate, their impact on the public education system is becoming an increasingly important public policy question. Charter school proponents argue that combined pressures of consumer choice and market competition will induce traditional public schools to respond by providing higher quality education and by promoting innovation and equity. Skeptics worry that charter schools pose risks of segregating students by race and economic level, and reducing per-pupil resources available to traditional public schools (Ertas, 2007, p. x).

Research is needed to investigate the impact of charter schools on raising the national achievement scores in the areas of math and reading. This study incorporates traditional public schools as a comparison to charter school programs across the nation.

Statement of the Problem: The Need for Change

Education has been near the top of the national domestic agenda since the 1980s. In that time, the federal government has passed innumerable small pieces of legislation, twice reauthorized the Elementary and Secondary Education Act, and dabbled with national standards and tests (Hess & Finn, 2004, p.1).

To examine the quality of education in the United States and create a report to the nation, Secretary of Education, T.H. Bell, created the National Commission on Excellence in Education in August, 1981. “This commission was created out of the widespread public perception that something is seriously remiss in our educational system” (U.S. Department of Education, 1983, p. 1). The publication of *A Nation at Risk* in April, 1983, stated that “we must demand the best effort and performance from all students, whether they are gifted or less able, affluent or disadvantaged, whether destined for college, the farm, or industry” (U.S. Department of Education, 1983, p. 1). This report provided a clear warning to the nation by concluding that there is a need for reform in America’s educational system.

Through the 1990s, national test scores remained low and dropout rates remained high.

Between 1987 and 1997, between 300,000 and 500,000 tenth through twelfth grade students left school each year without successfully completing a high school program. In October 1997, some 3.6 million young adults were not enrolled in a high school program and had not completed high school (Kaufman & Klein, 1999, p. v).

The National Academies Press (2003) noted that American society has failed to provide the kind of educational programs that students need to achieve high standards of learning. The report further noted that public schools should engage in learning activities that ensure high standards of achievement (p.2). Parents and educators began to explore alternatives to the traditional educational model.

According to Chubb and Moe (1990) many frustrated teachers, parents, and other stakeholders are not in a position to provide solutions to improve education because the traditional government structures and mandates are a larger part of the problem. The report further noted that public education should be a reinvented system of choice, flexibility, and accountability that includes the creation of charter schools (Gill, 2006, pp. 2-3).

Charter school advocates believed that the creation of charter school laws would lead to a variety of desirable outcomes: improved student achievement; improved student learning; improvement in district-run public schools as they responded to the new competition; and greater parent, student, and teacher satisfaction (Kolderie, 1990; Shoaf, 2007).

President Obama and Secretary of Education, Arne Duncan, view charters as an essential component of Pre-Kindergarten through Twelfth grade education reform strategies (Hopes, Fears, & Reality, 2009). A total of \$4.5 billion within the stimulus package have been allocated toward educational reform with the current administration making it clear that states not authorizing charters or lifting charter caps will be at a competitive disadvantage for funding initiatives including Race to the Top (Hopes, Fears,

& Reality, 2009). Enjoying wide support, charter schools are currently one of the fastest growing innovations in education policy (Publicschoolreview.org, 2009).

Purpose of the Study

The focus of this research is to provide quantitative evidence through a meta-analytic approach that examines the degree to which traditional public schools or charter schools experience higher levels of student achievement. This research can assist educators, legislators, and parents faced with the task of finding the best educational placement for a child by examining the impact on student mathematics and reading achievement as well as how various factors including gender, race, socioeconomic status, location (urban/rural), language barriers, school competition, and special education contribute to differences in achievement between traditional public schools and charter schools.

Prior research focusing on student achievement gains between charter schools and traditional public schools evidence limitations, including the variability among charter schools, the lack of a reliable assessment tools to assess results, as well as the fact that not every grade level is evaluated with each researcher focusing on specific grade levels. Another limitation that individual studies face is that the sample sizes do not make the results easily generalizable to students beyond the locale of the study.

“Making any generalization about charter schools masks the complexity of their experiences, whether the issue is enrollment, types of students served, teachers’ credentials, or school mission, one could find schools along a rather wide continuum of possibilities” (Noblit & Dickson, 2001, p.5).

This meta-analytic study incorporates elementary, middle, and high school grade levels to ensure that elementary, middle, and high school levels are represented. Studies were collected from around the country to represent the variability among charter school programs. To accurately assess students on their achievement gains, each study utilizes assessment results that are specifically geared towards measuring student achievement.

To clearly define what a charter school is, it is imperative to explore the foundation of charter school legislation in the United States and the political push for charter schools that led to the creation of charter law in a number of states.

Significance of the Study

If students attending charter schools experience higher levels of academic achievement, charter school enrollment numbers as well as the creation of many more schools will continue to flourish. Significant federal and state funding will also facilitate growth, as charter schools may be accepted as a remedy for a broken educational system fueling policy changes and mandates for educational reform. Financial support often puts the charter school programs at an advantage, providing new books, equipment and programming opportunities where public school students often go without.

The benefit of the current investigation is that it provides not only a measure of the impact of charter school education on mathematics and reading achievement scores, but also provides additional information about the educational arenas in which these assessment scores are maximized.

Organization of the Study

This study is presented in five chapters. The research problem to be investigated is presented in Chapter 1, the Introduction. It presents the statement of the problem, purpose of the study, hypotheses, definition of key terms, and the limitations of the study. Chapter 2 presents the review of related literature and important relevant findings of studies related to student achievement, charter schools, and public schools. Chapter 3 outlines the methodology, which describes the sample used in this study, the procedure implemented, and the coding for variables that are used in the meta-analysis. Chapter 4 presents a summary of the findings and Chapter 5 presents conclusions relevant to the recommendations for future research.

Limitations of the Study

Evaluating the effectiveness of charter schools on student achievement is inconsistent since there is no one type of charter school and no one consistent and reliable method in which to evaluate charter schools nationwide (Tschampl-Diesing, 2010, p. 9). Research on charter school performance is also limited by the outcome measures available. Test scores are one sort of outcome (Hill, Angel, & Christensen, 2006, p. 143). Autonomy and differing state regulations provide a wide variety of charter schools. In addition to the testing inconsistencies and variability from state to state, not every grade level is tested with researchers focusing on various different grade levels. Results must be interpreted with caution. They can assess the outcomes only of charter school students for whom several years of test results are available. Since statewide testing programs are just being introduced during many of the studies, data is available only for a minority of students. Results cannot be readily applied to the other states: every state has its own

peculiar mix of regulations, barriers to entry, and funding provisions, and these can all affect the results (Hill et al., 2006, p. 141)

According to Sass (2006) a considerable level of diversity can be found among charter schools. Many charter schools that seek out specific demographics of students may not be focusing on raising levels of student achievement in core subjects. A meta-analytic study that combines the research that has been conducted for a number of years would assist in examining the impact of charter schools and provide the appropriate mechanism to better understand the diversity that exists.

Definition of Key Terms

- Charter School –

“A charter school is a nonsectarian public school of choice that operates with freedom from many of the regulations that apply to traditional public schools. The ‘charter’ establishing each such school is a performance contract detailing the school's mission, program, goals, students served, methods of assessment, and ways to measure success. The length of time for which charters are granted varies, but most are granted for 3-5 years. At the end of the term, the entity granting the charter may renew the school's contract. Charter schools are accountable to their sponsor-usually a state or local school board-to produce positive academic results and adhere to the charter contract. The basic concept of charter schools is that they exercise increased autonomy in return for this accountability. They are accountable for both academic results and fiscal practices to several

groups: the sponsor that grants them, the parents who choose them and the public that funds them” (WestEd, 2000).

- Public School –

A school operated by publicly elected or appointed school officials in which the program and activities are under the control of these officials and which is supported by public funds (“Ohio revised code,” 2012).

CHAPTER II

Literature Review

The Charter School Concept

The charter school concept was created by University of Massachusetts Professor Ray Budde in 1974. He shared his ideas in a publication titled *Education by Charter*. “Budde used the term charter because he had been urging school districts to do what European kings had done for explorers – give them a charter to explore.” (Vergari, 2002, p. 20). This new charter idea would provide the opportunity for educators to use new approaches to teach math, reading and other academic subjects (Vergari, 2002).

Following the publication of *A Nation at Risk*, Budde’s publication caught the attention and support of Al Shanker, President of the American Federation of Teachers. The troubling data in the 1980s showed that schools were in danger and changes were needed. Shanker then publicized the idea, suggesting that local boards could charter an entire school with union and teacher approval. The idea that charters would be developed on the values of opportunity, choice, and responsibility for results began to gain attention (uscharterschools.org, 2009). Shanker’s support in the late 1980s soon gained the attention of an interest group in Minnesota led by John Rollwagen.

This interest group can be defined by Thomas and Hrebenar’s inclusive definition (1992) that considers an interest group as “any association of individuals whether formally organized or not, that attempts to influence public policy” (p. 153). Rollwagen’s Citizens League envisioned “a framework of state policy and the possibility of schools being authorized by the state as well as by a local board and attracted the interest of state legislators at The Itasca Seminar” (Kolderie, 2005).

Charter Schools Providing Choice and Opportunity to Students and Society

“Charter schools are schools of choice; choice to parents, students, teachers, and administrators” (Chen, 2007). Having the autonomy to create curricular options and programs that traditional public schools, private schools, and homeschooled students may not have the opportunity to create is attractive to students with different interests, learning styles, or needs.

Charter schools may provide an array of curricular options for students. The ability for a charter school to specifically focus on business, science, mathematics, technology, engineering, performing arts, dual language, culture, leadership, or a traditional school model may draw the attention of students interested in pursuing a career in the field that a charter school may provide as a specialized opportunity. “Charter schools provide a plethora of options and can be run by public school systems, by private schools, by for-profit entities, by nonprofit organizations, or by religious organizations (Tschampl-Diesing, 2010, p. 4).

Charter schools that provide unique curricular opportunities for students may not help students excel in an area of interest, but may save at-risk students from dropping out of school. According to Greene, Forster, and Winters (2003), special-focus or alternative schools tend to target students with educational disadvantages; students at those schools typically do more poorly in school and perform worse on assessments than their traditional education peers. According to the Office of Program Policy Analysis & Government Accountability (2005), the average charter school student is academically behind when entering charter schools compared to students remaining in traditional public schools. For this reason, charter school students are less likely to meet grade-level standards compared to students in traditional public schools; however, students who are

farthest behind make slightly more progress in charter schools than do students in traditional public schools. Common examples include schools that enroll students that are specifically at-risk youth, disabled students, drop-outs, girls who are pregnant or have children, and juvenile delinquents. Unique opportunities to learn in an alternative setting that meets the needs of at-risk students produce young adults that may become productive members of society.

Leading the Way: Minnesota Develops Charter School Legislation

In 1991, Minnesota Sen. Ember Reichgott, Rep. Ken Nelson, and Rep. Becky Kelso worked together to pass a version of the charter law into the House of Representatives (Minnesota Legislative Reference Library, 2005). Subsequently, the Senate agreed, and Gov. Arne Carlson signed it into law. Minnesota would soon lead the way for states across the nation to develop their own charter law.

Charter schools were legislated into existence in 1991 with the passage of Minnesota's charter school legislation. In 1992, the first charter school opened in St. Paul, Minnesota (McDonald, Ross, Bol, & McSparrin-Gallagher, 2007). Minnesota Republican Senator, Dave Durenberger, brought the charter idea to Washington, D.C. and joined forces with Connecticut's Democratic Senator, Joseph Lieberman, to introduce the Public School Redefinition Act legislation creating a federal start-up grant program for charter schools (Kolderie, 2005). "This legislation was designed to help legitimize a new education improvement strategy and to encourage states to pass laws allowing that strategy to emerge in schools that had adequate funding for their initial planning and start-up expenses" ("Minnesota's charter leadership," 2010). This legislation, adopted in 1994 with strong support from the Clinton Administration, added further encouragement to states to pass and implement charter laws.

The bipartisan team of Durenberger and Lieberman did not see their proposal adopted by Congress in 1991-92 but reintroduced their proposal in 1993.

President Clinton incorporated the Durenberger-Lieberman proposal into 1994 legislation reauthorizing the Elementary and Secondary Education Act (ESEA). This program was an attempt to motivate states to pass charter laws that would ultimately produce thousands of innovative new schools designed to leverage change and improvement in all public schools (Schroeder, 1997).

The founding legislators were purposefully brief in their definition of charter schools and of state charter school law so the individual states and the schools they authorize could determine how objectives would be met. The loose definition provided the opportunity for each state to develop their own legislation. Charter schools can be broadly characterized as publicly funded schools that students can choose to attend (Bulkley & Fisher, p. 2002). California became the second state to pass charter school legislation in 1992, providing school choice to students on the west coast. “By 1995, nineteen more states passed charter school legislation with many introducing variations on the original charter idea including non-district authorizers (Michigan, Massachusetts) and state-level appeal procedures to grant a charter (Colorado)” (Kolderie, 2005).

An Era of Accountability

Through the evolution of educational policy from the pauper schools, common schools crusade, and normative dominance through the standards movement of the 1990s to today’s focus on accountability, one can argue that charter schools are still a new concept in relation to other educational eras and cannot yet be considered effective or ineffective (Gronberg & Jansen, 2001; Tyack & Cuban, 1995). On the other hand, the

charter school phenomenon has attracted many more students than advocates ever imagined. The tremendous growth forced competition among school entities in hopes that each educational setting would reap the benefits (Barr, 2007; Booker, Gill, Zimmer, & Sass, 2007; Greene, Forster, & Winters, 2003; Jansen, 2001.)

Educational research has only now begun to focus on how to judge the performance of individual schools. The majority of evaluations have focused on specific instructional programs in specific subject areas or programs that are school wide initiatives such as tutoring programs. Questions about the effectiveness of individual schools were not a pressing matter in public education because the schools were assumed to be permanent and had never faced competition (Tyack & Cuban, 1995; Hill et al., 2006). “Research on the effectiveness of whole schools focused on marginal cases (e.g., parochial schools, magnets, or voucher-redeeming private schools). School effectiveness became a major research issue only when states and localities considered accountability schemes that could lead to school closure and replacement. Assessment proved technically and politically difficult, and few of the 48 states committed to standards-based reform ever figured out how to judge whether a school was good enough to continue or bad enough to need replaced (Hill et al., 2006). Now there is a sense of urgency about how to judge individual schools, due to both the rise of charter schools and the implementation of No Child Left Behind” (Hill et al., 2006, p. 144).

Novak and Fuller’s Policy Brief titled *Penalizing Diverse Schools?* discusses the accountability movement and the dilemmas that Washington is facing with the passage of No Child Left Behind. The authors stated that “Washington’s approach is heavy on testing, data, and punishments with few positive carrots to be found” (Novak & Fuller,

2003, p. 8). Collecting data and calculating progress for students simply to avoid federal penalties is not a motivating policy theory.

In traditional public school settings, the population of the school represents the demographic of the area. Charter schools, however, often attract students that may fall into multiple subgroups that greatly impact scores on standardized assessments. For example, a charter school specifically designed to assist dual language learners may attract a large population of Hispanic students. Schools enrolling more demographic subgroups do serve students who tend to score lower on standardized tests (Barr, 2007; Gill, 2006; Holyoke, Moser, & Henig, 2002; Lacireno-Paquet, Ni, & Arsen, 2011). “While it makes sense to compare traditional public school students and students that are enrolled in charter schools from similar racial and income backgrounds, there is not a guarantee that one group’s attendance at charter schools is the only difference between them” (Hill et. al, 2006, p. 142).

“Accountability for charter schools is made up of fiscal successes and academic achievement. The fiscal success is looked at with more scrutiny. The accountability for these issues falls on the authorizers, governing boards, and ultimately, the charter school” (Petrilli & Finn, Jr., 2006; Vergari, 2001). According to the National Alliance for Public Charter Schools, charter schools are required to meet all state and federal education standards. In addition, they are judged on how well they meet student achievement goals established by their charter contracts. A quality public charter school must meet rigorous academic, fiscal and managerial standards. Since public charter schools are funded with public dollars, they are required by law to be held accountable for taxpayer dollars spent

through regular audits and ongoing reviews from their authorizing entities (Tyack & Cuban, 1995).

Competition

Economist, Milton Friedman, once stated that “competition is a way in which both public and private schools can be required to satisfy their customers” (Thurman, 2010). Alternative educational options in the United States have evolved over time to include more options than just public or private school. Proponents of school choice believe today what Associate Justice, James Clark McReynolds believed when he rendered his 1925 decision on *Pierce v. Society of Sisters of the Holy Names of Jesus and Mary*, stating, “the responsibility belonged to the child’s parents or guardians, and that the ability to make such a choice was a ‘liberty’ protected by the Fourteenth Amendment” (*Pierce v. Society of Sisters*, 1925).

Montgomery (2004) noted that ‘charter schools implement innovative classrooms, longer school days, urban boarding schools and experiential education programs that are paying off through the enhancement of academic growth and parent satisfaction’ (p. 1). He further noted that traditional public schools and charter schools should view each other as partners striving for the same goal, increased academic achievement for all students (Gill, 2006, p. 8-9).

Charter school advocates claim that charter schools will not only provide greater gains in student achievement to students who enroll but will also foster competition that will lead to increases in the quality of traditional public schools.

According to Lacireno-Paquet, Holyoke, Moser, and Henig (2002), proponents of school choice present market-based competition as a means of leveling disparities between race, class and performance in public school systems. Opponents see school choice as threatening to exacerbate this problem because completion will pressure individual schools into targeting high performing students and the least encumbered with personal and social disadvantages. Lacireno-Paquet et al., (2002) find that rather than skimming the cream off the top of the potential student population enrolled in the traditional public school setting, market-oriented charter schools may be “cropping off” service to students whose language or special education needs make them more costly to educate (Buechler, 1996; Fitzgerald, Harris, Huidekoper, & Mani, 1998; Lee & Croninger; Moore & Davenport, 1990; Wells, 1993).

A number of researchers have attempted to claim that charter schools produce greater academic gains and foster competition using cross-sectional school-level comparisons that found mixed results ranging from large positive competitive effects to small or statistically insignificant competitive impacts Bettinger (1999), Eberts and Hollenbeck (2001), and Greene and Forster (2002). In examining this research, Sass concluded “whether measured by the presence of nearby charter schools, the number of competing charters, or the enrollment shared garnered by charter schools, charter school competition is associated with higher math and unchanged reading scores in traditional public schools (Sass, 2006, p.119).

Similarly, Hoxby’s (2001) study supports research on how competition from charter schools has positively influenced academic achievement in traditional public schools. Hoxby’s study examines mean test scores for students in Michigan and Arizona

before and after the introduction of charter schools. Hoxby found that schools in both states facing competition stemming from charter schools experience gains between 1 to 3 percentile points in average performance levels than schools not facing significant charter school competition (Bifulco & Ladd, 2004; Booker et al., 2004; Hoxby, 2001).

Booker, Gilpatric, Gronberg, and Jensen (2005) investigated the effects of charters on traditional public schools by looking for changes in student achievement outcomes in traditional public schools following charter market penetration. Using an eight-year panel of data on individual test scores for public school students in Texas to evaluate the achievement impact of charter schools, research indicates a positive and significant effect of charter school penetration on traditional public school outcomes supporting the potential for systemic achievement gains from completion-enhancing school reform policies (p.3-4). Positive effects consistent across both mathematics and reading scores support claims that expanding school choice may generate systemic gains (p. 21).

School Choice

Twenty-one years after the first charter school was opened, over \$2.5 billion in federal funding has played a major role in increasing the number of charter schools from about 50 in seven states in 1994, to a projected 5,200 charter schools in the 2010-11 school year (“Minnesota’s charter leadership,” 2010).

Today, many students have the flexibility to select from educational models separate from the services their home school district may provide. These options include secular and non-secular private schools, home school, charter schools, and cyber charter schools. Students enrolled in charter schools are entitled to school choice. Charter schools

spring from the impulse to meet educational needs that are not being fulfilled in the home school district. They respond to frustrations, demands, and dreams that the regular system—for whatever reason – is not satisfying (Smith, 2001, p. 20). However, if at any time a student is not feeling that the charter school is meeting their educational or social needs, they have the right to reenroll in the school district in which they reside.

The largest discrepancy between the intended and actual outcomes of charter school legislation must focus on the many different directions taken by the initial legislature passed in Minnesota. With each state having the autonomy of creating their own charter school legislation, different procedures and protocols provide a level of variability across the country (Noblit & Dickson, 2001; Vegari, 2002). The number of students enrolled in charter schools nationwide, as well as the variety of programs students can choose from at charter schools provides insight into the opportunities that may not have been readily available within their home school district.

Proponents of school choice and charter school education, including legislators, charter school parents, students, faculty, staff and groups such as the National Alliance for Public Charter Schools, convey success stories, thoughts, and ideas as well as their dissatisfaction. These individuals work to build partnerships between family, school, and the community to continually improve charter schools and provide educational alternatives through school choice ("National charter school," 2012). Buckley and Schneider (2007) describe the idea of choice being a powerful lure for parents. Choice is central for two reasons. Choice should improve parent and student satisfaction with the educational option selected, and secondly, choice should provide the foundation for competition by creating a range of products such as charter schools, from which

consumers, such as parents and students can choose. The idea that, with school choice creating competition, innovative educational options will develop (Buckley & Schneider, 2007; Dingerson, 2008; Friedman, 1995).

The debate over choice reform continues to rage as perceived declines in the quality of public school outputs, institutional reforms which expand choice, such as vouchers, compete with within-institution reforms, such as reductions in class size, as potential performance-enhancing policies (Booker et al., 2005).

With charter schools retaining the major defining characteristics of a public school, including public sector funding, non-selective admission, and public sector monitoring, charters are given greater degrees of freedom in dealing with certain regulations. The ability for charters to differentiate what they offer opposed to the traditional public school model, while charging the same zero tuition as public schools, makes charter schools potentially strong competitors for the current educational market (Booker et al., 2004; Gronberg & Jansen, 2001; Hanushek et al., 2002).

Political actors, including public charter school coalitions, parents, students, and charter school representatives, continually voice their opinions to legislators. Charter schools promote communication and collaboration with local politicians in hopes that these political actors will endorse their viewpoints and provide protection against opposition. Many schools invite legislators into their school to show them the innovative techniques and various learning opportunities available to students.

Ni and Arsen (2011) conducted a study to determine which public school districts felt the most pressure by school choice initiatives. Their study focused on the students that chose to stay in traditional public schools as opposed to students enrolled in charter schools. The purpose was to identify the fact that traditional public schools provided better educational opportunities due to competition, or if the charter school system's sole purpose was to identify winners and losers in education. Ni and Arsen found that the desire for school choice was more often expressed in urban areas than other demographic areas. According to the National Charter School Resource Center (2012), charter schools are leading innovation in cities across the country and increasing access to high-quality educational options in urban neighborhoods. To build on the strength of the charter movement, several urban communities are embracing charter schools as an integral component of citywide reform initiatives that are designed to improve the quality of public education for all students.

Central city and low income suburban districts have experienced the greatest decline of enrollment in traditional public schools due to school choice competition (Ni & Arsen, 2011; Lacireno-Paquet, Holyoke, Moser, & Henig, 2002). Results show that Detroit City Schools have lost approximately a third of their students to charter schools (Ni & Arsen, 2011). Data indicates that rural districts in Michigan have the lowest average of participation in charter schools due to lack of availability of charter programs in rural areas. Since most students reflect a need for charter schools in the low income urban areas that is where most charter schools have been founded in the state of Michigan.

Opponents of school choice argue that greater choice may exacerbate current racial segregation and create fiscal strains for states and school districts (Wells et al., 1998; Fisk & Ladd, 2000; Lacireno-Paquet et al., 2002). Ni and Arsen (2011) conclude that school choice activity is significantly influenced by socioeconomic characteristics of students. Most of the areas of the state of Michigan that participate in school choice are inner-city, low income, low achieving districts.

Student Achievement

“Improving student learning is among the most important goals of charter school programs, and scholars and policy makers alike have been awaiting evaluations of how charter schools have affected student achievement” (Bifulco & Ladd, 2004, p. 4). Bifulco and Ladd (2004) describe several ways in which charter schools might improve student achievement (p.5). First, they may increase the performance of the students who choose them by providing more effective learning environments than traditional public schools. Charter schools might do this by hiring more effective teachers, by using resources more efficiently, or by attracting a more motivated set of students who provide positive spillover benefits to other students. Second, even if charter schools are no more effective than traditional public schools for the typical student, they might benefit some students by providing alternative educational environments and programs. At-risk students in traditional school settings, for example, might do better in charter schools if those schools offer smaller, more intimate educational environments, specialized curricula, or targeted support services. Finally, the achievement of students in traditional public schools could rise if the competition from charter schools for students and funding enticed traditional public schools to become more productive.

Charter schools may potentially achieve at lower rates than traditional public schools if charter schools receive less funding, are operated by less experienced or less qualified officials, provide a peer environment that is less conducive to achievement, or for some other reason are unable to provide an effective educational program. Charter schools might also diminish the quality of traditional public schools by drawing away funding, motivated students and/or teachers. Sass finds that student population attending Florida's charter schools is quite similar to those of students in traditional public schools indicating no strong evidence that charter schools attract the best students from traditional public schools (Sass, 2006).

Chau, McCaffrey, Zimmer, Daley, and Gill (2003) stated that charter school advocates have often touted charters as a means to give choices to disadvantaged students who otherwise lack choice (Nathan, 1998). Critics have worried that as schools of choice, charters will "skim the cream," attracting and selecting the high-achieving students and leaving disadvantaged students behind in impoverished conventional public schools (Vergari, 1999; Wells et al., 1998). Solmon, Paark, and Garcia (2001) find that rather than cream skimming, it appears that Arizona charter schools, particularly at the high school level, have become havens for students with special problems, returning former dropouts, and other "referred" to them by traditional public schools. In addition to Solmon, Paark, and Garcia's findings, Lacireno-Paquet, Holyoke, Moser, and Henig (2002) find little evidence that market-oriented charters are focusing on an elite clientele, but they are less likely than the other types of schools to serve some high need populations. "Rather than skimming the cream off the top of the potential student population, charter schools may be "cropping off" service to students whose language or

special education needs make them more costly to educate” (Lacireno-Paquet, Holyoke, Moser, & Henig, 2002, p.1).

Researchers found that students who attend charter schools were average or lower performing than other students at the traditional public school that they leave – the performance gap is greatest for black students (National Charter School Research Project, 2005). Booker, Zimmer, and Buddin (2005) examined both charter and traditional public schools in California and found that black, white, Hispanic, and Asian students tend to enroll in charter schools that have a lower percent of students of the same race/ethnicity and that are more diverse than their traditional public schools.

When reviewing this synthesis of research on student achievement in charter schools and traditional schools, one should be mindful of limitations. It is important to state unequivocally that student achievement is not the only relevant outcome of attending charter school or any traditional public school.

A full assessment of charter schools’ effectiveness and overall desirability must examine other outcomes, such as equity, customer satisfaction and market accountability, the schools’ legitimacy in the eyes of key stakeholders, and so on. Moreover, even if student achievement were the only goal of charter schools, standardized test results are only one of many ways to assess it. Few, if any, measurement experts would endorse evaluating a school or student on the basis of standardized tests alone (Nelson, 2004, p. 1; Tschampl-Diesing, 2010).

According to Tschampl-Diesing (2010), many researchers conclude that it is not possible to get an accurate view of student achievement in charter schools because there

is no one set type of charter school approach, there are no common academic performance requirements or regulations since each state is allowed to create their own charter laws, and charter schools can often have a higher percent of disadvantaged students than traditional public schools (p.6). Federal mandates have pushed for accountability and assessment measures that ensure a level of commonality in both public schools and charter schools. Studies also argue that charter school programs generally have a similar demographic representation to their public school district counterparts.

Researchers who use a lottery-in/lottery-out research design (Hoxby et al., 2007, 2009) are conducting an ongoing study of New York City's charter schools; Abdulkadiroglu et al., (2009) studied the effect of charter schools in Boston which limits its usefulness for generalization. Berend, Mendiburo, and Nicotera, (2009) found that results from these charter schools' studies have been overwhelmingly positive. In Chicago, charter students in Kindergarten through fifth grade improved 6 to 7 percentile points in math and 5 to 6 percentile points in reading. In New York City, charter school students earned higher achievement in both mathematics and reading in all grade levels compared with their counterparts who lost the lottery. In Boston, students who attend middle and high school charter schools outperform students in the traditional public schools.

In the event lottery data is not available, Berends et al., (2009) suggest that researchers utilize longitudinal data and alternative model specifications to attempt to limit selection bias in the estimation of charter school achievement effects. Selection bias is a concern when studying schools of choice because students who select charter schools

may be atypical of the larger population of traditional public school students in ways that may influence achievement.

A second option for collecting data would be to follow the same student over time and compare the student's achievement gains at different points in time. This strategy holds the student characteristics constant and then compares the gains a student experienced when attending a traditional public school with the gains the same student experiences in a charter school. Since the model estimates the charter effect for students who attended traditional public and charter schools, the student fixed-effects model diminishes selection bias.

More sophisticated studies compare learning rates of individual students before and after they enter charter schools. According to Hill, Angel, and Christensen (2006), studies conducted by Sass (2006) and Bifulco and Ladd (2006), are using much better methods and taking greater care to say whether their results can be generalized to charter schools overall or to a limited set of schools overall or to a limited set of schools (p. 140-141)

A limitation to student fixed-effects models (Ballou et al., 2008; Hoxby & Murarka, 2008) focused on the students who switch from traditional public school to charter school and the struggle to make assumptions that past gain trajectories are good predictors of future gain trajectories. Berends et al., (2009) clarify that if students have a dip in achievement in the years prior to entry, the subsequent gain in the charter school could overestimate the true impact of the charter school. While these concerns are valid, the student fixed-effects model is considered to be a better strategy for estimating charter

school effects than matching techniques (Sass, 2006; Tang & Betts, 2006; Zimmer et al., 2009).

Where are Charter Schools?

Since the inception of charter school legislation over twenty years ago in Minnesota, 42 states have adopted charter school laws. The National Alliance of Public Charter Schools (2012) reports that over two million children in grades K-12 are educated in charter schools across the United States. The National Alliance for Public Charter Schools (2012) also reported that for the 2011-2012 school year, it is estimated that there are 5,000 charter schools across the country. Approximately one quarter of these charter schools are operated by management foundations, 45% by nonprofit organizations, and 55% by for-profit organizations (Manno, 2010). Manno (2010) also reports that 38% of the District of Columbia public schools and 36% of Detroit's public school students were enrolled in charter schools in 2010. Next was New Orleans with 61%. In total, charter schools serve at least 10% of students in public schools (Bulkley, 2011).

Charter School Demographics

Most charter schools are located in urban areas. As states began to adopt charter school laws, there was hope that these schools would provide school choice for students in low socioeconomic standing (Stoddard & Corcoran, 2008; Zimmer, Blanc, Gill, & Christman, 2008; Hoxby & Rockoff, 2004; Henig, Holyoke, Lacireno-Paquet, & Moser, 2002). Stoddard and Corcoran's (2008) study examined which states had the largest charter school representation and how to correlate the amount of participation with the

strength of charter law. The researchers analyzed data from multiple national education reporting systems to determine the enrollment in each state as well as the number of schools, and collected data from each of the states' charter laws. Stoddard and Corcoran's conclusions list multiple reasons for the expansion of charter schools in certain areas. The most powerful reason they found was growing diversity in states, districts, and populations. States with districts of higher percentages of African American and college educated adults had a substantially larger amount of students enrolled in charter schools. Another contributor to expansion of charter schools in certain demographics was the lower the achievement and graduation rate, the higher the charter school involvement.

Who Creates Charter Schools?

Regardless of a student's race, gender, political affiliation, and social economic status, parents want an educational institution to prepare their child or children for a success (Johnson, 2001). Since charter schools can be created and controlled by teachers, parents, and community leaders, citizens dissatisfied with other educational models such as the home school district or parochial and private schools are free to propose a new charter school (Vegari, 2002). Diversity in the founding, mission, curriculum, pedagogy, administration, and state governance legislation provides a great deal of variability in how charter schools are structured compared to traditional public schools (Bagwell, 2005; Noblit & Dickson, 2001). When public schools create their own charter school within the school district, implementation barriers are minimal since the funding resources would stay within the school district, and new opportunities may be afforded to students. With the creation of charter schools dependent upon board approval, districts interested in developing their own educational alternative to prevent students

from leaving the district make it unlikely the school board would not vote in favor of the model (Vegari, 2002).

As part of the accountability system from the No Child Left Behind Act (NCLB), 2003, President Bush gave school districts the option of turning their underperforming schools over to the state department or converting them to charter schools. Buddin and Zimmer (2005) reported that traditional public schools typically converted to charters for the autonomy of instructional practices, to reduce the bureaucracy from the LEAs and/or to free them from mandated curriculum requirements (Buddin & Zimmer, 2005). Private schools converted mainly for the purposes of attaining state funding (RPP International, 2000).

Prior Charter and Traditional Public School Studies

The majority of current research focusing on academic achievement in traditional public and charter schools focuses on mathematics and reading scores from state assessments. Thirty-one of the forty-seven studies included in this meta-analysis utilize state level assessments such as the Florida Comprehensive Assessment Test (FCAT) (Sass, 2006), Texas Assessment of Academic Skills Test (Booker, Gilpatric, Gronberg, & Jansen, 2005) and the Arizona instrument to Measure Standards (AIMS) (Giovannone, 2010). They are examples of standardized assessments included in the study. Other studies utilize district, regional, or for profit assessments.

Much of the research that shows charter school students outperforming traditional public school students use some type of state test to compare academic achievement (Buddin & Zimmer, 2005; Chamberlin, 2007; Witte et al., 2007). Results of the current

research on charter school achievement tend to produce mixed results regardless of the methods used with some providing positive results, some negative, with null or mixed findings the most common.

Mixed Findings

Prior meta-analytic studies conducted by Hassel (2005), Hill (2006), and the National Alliance of Public Charter Schools (2009) each concluded with mixed findings regarding student achievement in traditional public and charter schools. Berends, Mendiburo, and Nicotera's (2009) study on the academic achievement of an urban school district in the Indianapolis area found mixed results for math and reading (Booker et al., 2007; Solomon & Goldschmidt, 2004; Tang & Betts, 2006; Witte et al., 2007; Zimmer et al., 2003; Zimmer et al., 2009).

Studies that find mixed results may attribute differences to their methodological approach. Ballou (2006) uses two estimators: a comparison of average test score gains controlling for a limited number of student characteristics, and a fixed effects estimator. When student fixed effects are included, charter schools appear more effective than traditional public schools in the elementary grades. When student fixed effects are omitted, the results are no longer true.

Charter school effects may be negative or statistically insignificant at every grade level. Results may not reliably conclude that charter students are performing better or worse than other students. A number of charter school studies find mixed results for mathematics and reading student achievement when compared to traditional public

schools (Barr, 2007; Booker et al., 2007; Tang & Betts, 2006; Witte et al., 2007; Zimmer et al., 2003; Zimmer et al., 2009; Zoblotsky, Qian, Ross, & McDonald, 2008).

No Significant Difference

Some studies find no statistically significant differences between traditional public schools and charter schools. Bagwell (2005) used a quasi-experimental pre-test posttest control group design with random selection from four northeastern middle school populations to compare student achievement levels for public and charter middle school students. Bagwell found that there were no statistically significant differences between public middle schools and charter schools in mathematics, writing, and reading achievement scores after controlling for initial achievement as measured by the Connecticut Mastery Test.

A comparative study conducted by Miller (2003) focusing on elementary level students in Idaho traditional public schools and charter schools found no significant difference between mathematics and reading achievement among students. Miller claims that while there are demographic differences between charter schools and their constituent school districts, there is essentially no difference in student achievement when the charters are compared to the most closely watched elementary school in the constituent district (Akey, Plucker, Hansen, Michael, Branon, Fagen, & Zhou, 2008; Charter school performance, 2005; Zoblotsky et al., 2008). Barr, Sadovnik, and Visconti (2006) conclude that charter schools are similar to district urban public schools, with pockets of excellence and mediocrity.

Charter Achievement Growth Over Time

Katrina Bulkley and Fisler (2002) reviewed 52 studies of operating charter schools and explained some of the limitations of student achievement data. During the first one to three years, charter schools are focused on becoming viable organizations – the need to find appropriate facilities, resources, curriculum, teachers, and leadership hampers progress in establishing baseline data to be used in measuring student achievement. A number of studies yield similar results to Sass’ finding that achievement gains are lower or insignificant during the first year of a charter school’s operation, however, statistically significant evidence shows that gains in mathematics and reading levels are made over time between three and six years (Booker et.al, 2005; Finch, Baker-Boudissa & Cross, 2007; Hanushek, Kain, & Rivkin, 2002; Solmon, Paark, & Garcia, 2001; Miron, Coryn, & Mackety, 2007).

Sass’ (2006) findings indicate that new charter schools tend to have lower student achievement levels than the average traditional public school with charter schools showing improvement over time and by the fifth year of operation. Florida charter schools are found to reach a par with traditional public schools in math and produce reading achievement scores that exceed those of the average traditional public school by an amount equal to 10 % of the average annual achievement gain (p. 119).

Charter Schools Outperforming Traditional Public Schools

A number of studies find positive effects for charter schools that are consistent across various assumptions concerning comparison groups, subjects, and grades demonstrating growth in achievement at a pace that often exceeds expected growth

according to state and national norms (Ball State University, 2004; Comey, 2008; Florida Department of Education, 2009; Hoxby, 2004; McDonald, Ross, & Bol, 2007; Miron, Cullen, Applegate, & Farrell, 2007); Rattermann & Reid, 2009; Witte, Weimer, Schlomer, & Shober, 2004; Woodworth, Guha, Wang, & Lopez-Torkos, 2008).

Gill's 2006 comparative analysis of academic achievement among traditional public high school students and public charter high school students in South Carolina indicated that public charter high school students scored higher than traditional public high school students in eight out of ten areas measured in the study. The public charter high school students' reading mean scores were significantly higher than the traditional public high school students. According to the author, these findings support the research of Greene, Forester, and Winters (2003) who conducted a study of traditional public schools and public charter schools in 11 states, Arizona, California, Colorado, Florida, Michigan, Minnesota, New Jersey, North Carolina, Ohio, Pennsylvania, and Texas. The comparison revealed that charter school students' performances in reading and math were slightly higher than traditional public school students nationally (p. 37).

Traditional Public Schools Outperforming Charter School Achievement Scores

Studies conducted for students in Michigan including Eberts and Hollenbeck (2001) found that Michigan charter schools scored three to seven percent lower than comparable host districts on state criterion reference examinations. Horn and Miron's (2000) earlier study was slightly less negative, finding that charter school trends were either

indistinguishable from or lower than those of their host districts in all grades and areas except fifth grade science (Miron & Nelson, 2001, p. 18).

Bifulco and Ladd's (2006) study of the impacts of charter school on student achievement in North Carolina utilizes a fixed-effects model and finds that students make considerably smaller achievement gains in charter schools than they would have if they stayed enrolled in public schools, however, this negative effect diminishes as charter schools gain more operating experiences (p. 7). The study also finds suggestive evidence that about 30% of the negative effect of charter schools is attributable to high rates of student turnover (Bifulco & Ladd, 2006, p. 3). Bifulco and Ladd use similar methodology that can be found in Hanushek, Kain, and Rivkin's (2002) study in Texas with both utilizing student fixed effects to isolate the average impact of charter school on charter students.

Gronberg and Jansen (2001) found that while charter schools overall scored lower on the state test than non-charter schools, schools classified by the state as "at-risk" outscored comparable non-charter public schools.

Conclusion

A number of researchers have compared student achievement in traditional public school settings to charter schools and have found positive, negative, non-significant and mixed results. This meta-analysis hopes to combine data that has guided research over the last decade, covering a significant time of educational reform and opportunity for states around the country who have implemented charter school law to evaluate the effectiveness of school choice. Through the mid to late 1990s, charter schools were new

entrants in the market for educational services with all charter schools being either new or recently established with initially few students in few schools compared to the traditional public school model. Currently there are still relatively few students in charter schools compared to the traditional public school model, although the number of charter students has grown significantly (Gronberg & Jansen, 2001). Data collection for this study aims to encompass the tremendous growth of charter schools across the nation.

Examining this past decade captures the tremendous growth rate in charter schools during the implementation of “No Child Left Behind” legislation, providing valuable data on students enrolled in both traditional public schools and charter schools including academic achievement in reading and mathematics. Student-level variables that may impact student achievement are also be analyzed, including competition effects, socioeconomic status, geographic location, gender, race, English Language Learners, and special education.

In an era of fiscal crisis and uncertainty in many school districts, many legislators, administrators, and parents are faced with making evidence-based decisions that potentially change and redefine the public school model and promote choices that differ from the traditional school district offerings.

Given the magnitude of the research that has been conducted to date, as well as the varying populations in urban and rural areas across the country, this study should assist in depicting the variability among charter schools, provoke thought and future research, and provide insight on the achievement levels in both charter and traditional

school settings. This study is the first study that synthesizes the impact of charter schools versus traditional public schools over the course of the last decade.

CHAPTER III

Methodology

Data Analytical Method

Glass (1976, 1977) stated that the purpose of meta-analysis is to summarize and describe the studies in a research literature; whereas, Rubin (1990) describes the goal of meta-analysis is to estimate true effects or relationships. Prior to using meta-analytic studies, research literatures were conflicting and contradictory as the number of studies on a particular question grew causing feelings of frustration and intolerability (Hunter & Schmidt, 1990). Conducting a meta-analysis requires the researcher to collect a number of relevant quantitative studies and combine the data to improve and increase the sample size and statistical power.

Hunter and Schmidt (1990) stated that meta-analytic studies presented much less conflict between studies than had been believed when combining a number of studies to find an effect; that coherent, useful, and generalizable conclusions can be drawn from research literatures. Glass, McGraw, and Smith (1981) define meta-analysis as the “analysis of analyses”. To conduct a meta-analysis on student achievement in traditional and charter public schools, an exhaustive search of the existing quantitative literature was first conducted. By performing an exhaustive search, data could be collected that was both old and new. Incorporating the latest research ensures that search bias is minimized.

Using a number of appropriate parameters focusing on key words, publication dates, and assessments used, a number of studies fit the provided criteria that contained

the data needed for analysis. A detailed description of the search parameters can be found under *Sample of Studies*.

According to Glass et al. (1981), the next step to a meta-analysis is to describe, classify and code all the research studies to be included in the meta-analysis. To ensure measurement consistency, Glass et al. recommend that studies be coded a minimum of two times to establish rater agreement. Moderator variables must be clearly defined so raters are able to make clear distinctions between classifications.

Research Questions

The present meta-analysis seeks to examine the following questions:

1. What is the impact of charter versus public school on student achievement across the areas of mathematics and reading?
2. What is the impact of charter versus public school education on student achievement across different student levels (Elementary, Middle, High School)?
3. What is the impact of charter versus public school education on student achievement across the different types of achievement measures (District, State, Regional, For-Profit) used to collect data for the studies included in the analysis?
4. What is the impact of charter versus public school education on student achievement across different geographic regions?
5. What is the impact of charter versus public school education on student achievement across different socioeconomic statuses?
6. What is the impact of charter versus public school education on student achievement across different populations (Urban, Suburban, Rural)?

7. What is the impact of charter versus public school education on student achievement across schools indicating the presence or absence of English Language Learners (ELL)?
8. What is the impact of charter versus public school education on student achievement across schools indicating the presence or absence of special education?
9. What is the impact of charter versus public school education on student achievement across schools with or without lottery systems (Competition)?
10. What is the impact of charter versus public school education on student achievement across different data sources (Dissertation, Professional Organization, College/University)?
11. What is the impact of charter versus public school education on student achievement across the publication status of the studies included in the analysis?
12. What is the impact of charter versus public school education on student achievement across the publication years of the studies included in the analysis?

Sample of Studies

Studies included in this meta-analysis were collected through exhaustive searches. A number of electronic data bases have been searched over a six month period of time with numerous studies also being ordered through Youngstown State University's Maag Library, and Slippery Rock University's Bailey Library. Data bases including Digital Dissertations, Educational Resources Information Center (ERIC), EBSCO, Electronic Journal Center (EJC), Google Scholar, and JSTOR are being utilized. This search hopes to examine research spanning from 2001 to 2012. The descriptive search criteria was

employed to identify relevant materials includes such combinations as charter school achievement, charter schools' student achievement, public school student achievement, academic achievement in charter and public schools, as well as each of these criteria with the addition of elementary, middle, and high school students. Abstracts of articles were reviewed and evaluated. Articles that did not meet the initial inclusion criteria were removed. The inclusion criteria includes (1) articles examining student or academic achievement in traditional public and charter schools; (2) articles examining the instruction of students in K-12 schools; (3) articles examining the use of an achievement assessment. Studies that were published prior to 2001 were excluded from the study; however studies that include achievement data prior to 2001 were included. Studies specifically focusing on online learning, distance learning, cyber schools or cyber charter schools were excluded due to the limited research conducted.

Shoaf (2007) concludes that further research must be done in the areas of student achievement and in charter school satisfaction to assist in making educational decisions that best meet the needs of the student population they serve. Shoaf's findings indicate that online charters provide flexibility and individualization for student instruction (p. 197).

Due to limited research conducted on student achievement in cyber charter schools across the nation, online learning was omitted from this study to maintain a focus on brick-and-mortar traditional public and charter schools.

The relevant literature that is electronically available was printed, and other relevant sources were ordered through the Youngstown State University and Slippery Rock University library systems. Next, the reference list of each relevant article was

searched to find any additional publications that fit the search criteria and assist in making the search exhaustive of past and current literature. More than seventy studies were identified by these methods, and were examined for possible inclusion in this meta-analysis. A number of studies initially appeared to fit the search criteria for inclusion in this meta-analysis, but a careful review showed that some studies did not meet the criteria included in the search criteria.

Studies that failed to provide the necessary information, including student achievement data on mathematics and reading were excluded from the meta-analysis. These search and review procedures produced 11 useable studies that produced approximately 122 effect sizes.

Coding of Studies

Each study was coded according to the following information: (a) level of student (Elementary/Middle/High School); (b) type of achievement measure provided; (c) geographic division where the study was conducted; (d) student socioeconomic status; (e) urban/suburban/rural educational setting; (f) English language learner population; (g) special education population; (h) competition effect; (i) source of research study; (j) year of study publication; (k) whether the study was published or not.

Student Level (a)

The first study characteristic indicates the academic level of the population to identify if the sample in each study includes elementary, middle or high school level data. Categories include elementary level only, middle school only, high school only, or a combination of levels.

Achievement Measure (b)

The second study characteristic focuses on the achievement measure used. A variety of assessments have been developed since the inception of No Child Left Behind legislation to measure academic achievement in schools. Categories for this variable include the type of assessment used, identifying them as district, state, regional, or end of year assessments.

Geographic Division (c)

Students are enrolled in charter schools in a variety of settings including urban and rural areas. The third study characteristic is categorized by the national geographic division in which the study takes place.

Student Socioeconomic Status (d)

Socioeconomic status is the fourth study characteristic and is measured throughout past and current research as the free and reduced lunch percentages found in each studies student population. Socioeconomic levels are categorized by the percentages of students eligible for services including; (1) less than forty percent; (2) between fifty and sixty percent; (3) between sixty and seventy percent; (4) between seventy and eighty percent; (5) between eighty and ninety percent; and (6) greater than ninety percent.

Urban/Suburban/Rural Educational Setting (e)

The fifth study characteristic uses data from the 2010 Census Bureau examining the percentages of urban and rural populations in 2010. The state in which each study is conducted is matched with Census Bureau data to determine the urban, suburban, and

rural populations. Census Bureau data did not indicate suburban levels, however urban and rural demographic information was published. This study characteristic is categorized by an urban to rural ratio including:

(1) fifty/fifty, (2) sixty/forty, (3) seventy/thirty, (4) eighty/twenty, (5) ninety/ten, (6) forty/sixty, (7) mixed state locations.

English Language Learner Population (f)

The sixth study characteristic examines whether or not the study includes students that are English Language Learners (ELL). ELL categories include (1) Yes – ELL included; (2) No – ELL is not present in the study.

Special Education Population (g)

The seventh study characteristic examines whether or not the study includes students that qualify for special education services. Special education categories include (1) Yes – Special Education included; (2) No – Special Education is not present in the study.

Competition Effect (h)|

The eighth study characteristic examines whether or not the study uses a lottery system to determine student enrollment in populations where charter programs may be in high demand with competitive enrollment. Competition effect categories include (1) Yes – Lottery system is present in the study; (2) No – Lottery system is not present in the study.

Source of Research Study (i)

Studies included in this meta-analysis include published journal articles by professional organizations and college or university studies, published dissertations, and unpublished working papers. The second study characteristic categorizes the type of study.

Year of Study (j)

The tenth study characteristic is the year of the research publication. Since the adoption of the first charter law was passed in Minnesota in 1991, the number of charter schools grew rapidly across the nation. “Charter schools have recast the definition of public school and have presented the field of education with its greatest challenge” (Murphy & Dunn, 2002, p. 1).

Publication Status (k)

The eleventh study characteristic of this meta-analysis separates research according to each studies publication status (i.e., published or not published). This study includes both published and unpublished research to avoid an imbalance of results sometimes only found in published studies that would be unrepresentative of the population of completed studies. When the research that is readily available differs in its results from the results of all the research that has been done in an area, readers and reviewers of that research are in danger of drawing incorrect conclusions about what the body of research shows (Rothstein, Sutton, & Borenstein, 2005).

Dependent Variable

The dependent variable for all studies is the measure of mathematics and reading student achievement provided by the authors. Research collected to date has provided a mean achievement measure score for the students from the treatment group and for the students in the control groups.

Calculation of Effect Sizes

There are several ways to calculate effect size. The three most popular approaches are Gene Glass's approach, Hunter-Schmidt's approach, and Cohen's *d*. For this meta-analytic study, all statistics from each study have been converted to Cohen's *d*. Cohen's *d* statistic is computed by dividing the mean difference between groups by the pooled standard deviation. It can also be calculated from the value of the *t*-test of the differences between group means (Cohen, 1988).

Once effect sizes are calculated for each study, the overall effect size measure for all the studies combined was calculated. The overall effect size measure for all studies can be determined by calculating the mean of the individual effect size measures (Glass et al., 1981).

Interpretation of Effect Sizes

Cohen's (1992) suggested guidelines for interpreting effect size measures indicate that a large effect size is one that is greater than 0.5, a medium effect size is at least 0.3, and a small effect size is less than 0.1.

CHAPTER IV

Results

Introduction

The primary purpose of this meta-analytic investigation was to investigate the impact of charter versus public education on student achievement across a number of moderators. These moderators include: the student educational level, data source, publication status, publication year, achievement measure, geographic location, socioeconomic status, urban/rural ratio, English Language Learner student population, special education student population, and competition.

The initial search for studies relating to key words and phrases including, charter school achievement, charter schools student achievement, public school student achievement, academic achievement in charter and public schools, revealed a total of 76 studies. After eliminating studies that did not focus on school-age students from Kindergarten through twelfth grade using an academic achievement test that were published after 2001, 47 studies met the selection criteria. After setting the selection criteria to perform an analysis that specifically provides comparison data on reading and mathematics student achievement in traditional public schools relative to charter schools, 11 studies met the criteria for analysis. These 11 studies provided a total of 122 effect-size measures.

This meta-analysis was guided by 12 research questions. These questions included:

1. What is the impact of charter versus public school on student achievement across the areas of mathematics and reading?
2. What is the impact of charter versus public school education on student achievement across different student levels (Elementary, Middle, High School)?
3. What is the impact of charter versus public school education on student achievement across the different types of achievement measures (District, State, Regional, For-Profit) used to collect data?
4. What is the impact of charter versus public school education on student achievement across different geographic regions?
5. What is the impact of charter versus public school education on student achievement across different socioeconomic statuses?
6. What is the impact of charter versus public school education on student achievement across different populations (Urban, Suburban, Rural)?
7. What is the impact of charter versus public school education on student achievement across schools indicating the presence or absence of English Language Learners (ELL)?
8. What is the impact of charter versus public school education on student achievement across schools indicating the presence or absence of special education?
9. What is the impact of charter versus public school education on student achievement across schools with or without lottery systems (Competition)?

10. What is the impact of charter versus public school education on student achievement across different data sources (Dissertation, Professional Organization, College/University)?
11. What is the impact of charter versus public school education on student achievement across the publication years of the studies?
12. What is the impact of charter versus public school education on student achievement across the publication status of the studies?

The 12 primary and secondary questions were used to identify the 11 moderators that were coded and analyzed using CMA to determine if there was any significant effect of the characteristics of traditional public schools and charter schools on student achievement and, if so, what was the level of the effect across the various levels of the moderators. Two studies representing five effect sizes were removed from the analysis due to extremely large sample sizes compared to all others (i.e., Zimmer et al.; Booker et al.). These two studies have sample sizes in excess of ($n = 1.8$) million students. As a result, a total of eleven studies were included in final analysis.

Descriptive Analysis of Effect Sizes

The primary purpose of this meta-analytic investigation was to investigate the impact of charter versus public education on student achievement across a number of moderators. A comprehensive review of the literature produced 11 studies that met the inclusion criteria, including six studies from professional organizations, two dissertations, and three studies completed by universities. The effect size measures within the study range from -8.650 to 2.140, yielding a grand mean overall effect size measure ($d = -.270$) ($p < .001$), a significant negative, small to moderate sized effect according to Cohen's

(1992) guidelines for effect sizes (.5 = large, .3 = moderate, and .1 = small). This result indicates that charter school educational programs are producing lower achievement scores in reading and mathematics when compared to traditional public schools' reading and mathematics achievement results. This overall effect is based on a sample size of 1,109,984 students.

Sixty-eight of the 122 effect sizes (56%) that were used in this study were negative which implies that charter school educational programs are producing lower achievement in reading and mathematics. Fifty-four of the 122 effect sizes (44%) that were used in this study were positive indicating charter school educational programs are performing at higher rates than traditional public schools (control group). The analyses also reveal that six (55%) of the 11 studies had a mean effect size of $|0.5|$ or greater that the effects of the moderators on student achievement according to Cohen (1992) were considered large. Table 1 provides a detailed breakdown of the 11 studies that met the criteria to be included in the study.

Table 1: The Primary Studies in the Meta-Analysis with Effect Sizes

Study	n of ES	ES range
Barr et al. (2006)	2	-0.021 to 0.063
Bettinger (2005)	12	0.800 to 2.140
Gill (2006)	2	-0.882 to -1.064
Johnson (2011)	12	-0.245 to 0.411
McDonald et al. (2007)	18	-1.034 to 0.047
Miron et al. (2007)	12	-8.650 to 0.548
Solmon (2001)	6	-1.380 to 0.131
Witte et al. (2007)	4	-0.391 to 0.230
Woodworth et al. (2008)	8	-0.550 to -0.307
Zimmer et al. (2009)	14	-0.090 to 0.100
Zoblotsky et al. (2008)	32	-1.107 to 1.100

A detailed breakout of each study and its respective effect sizes is provided in Appendix B.

The following section provides a summary of analysis results examining each study moderator on the dependent variable which in this case is mathematics and reading student achievement. Each analysis used to determine what effect exists across the various moderators. The tables below identify each moderator's mean effect size. Significant effect sizes according to Cohen (1992) are recognized by an asterisk following the mean effect size.

Meta-Analysis Results by Moderator and Levels

Mathematics and Reading:

Analysis conducted in an effort to find the mean effect size of mathematics and reading suggests that there is not significant difference between mathematics ($d = -.286$) and reading ($d = -.254, p = .826$). Both subject areas produce basically the same estimate.

According to Cohen (1992), the mathematics and reading both produce a significant small-to-moderate negative effect consistent with the grand mean effect size measure. These results indicate that achievement results in charter schools are lower than public schools across both mathematics and reading achievement. Likewise, these results indicate that there is no difference in the impact on reading achievement relative to mathematics achievement. The results for this analysis can be found in Table 2.

Table 2: Mathematics and Reading

Variables and Categories	Number of Effect Size Measures	With-In Groups Effects	Mean Effect Size
Mathematics and Reading		0.048	
Mathematics	61		-0.286*
Reading	61		-0.254*

Student Level:

Analysis was conducted in an effort to assess the impact of charter versus public school education on student achievement across different student levels (Elementary, Middle, High School). Results indicate there are significant differences across the different levels of students ($p < .001$). Mean effect sizes of the various school levels include Elementary School, Middle School, High School, and a category combining all levels. The mean effect size of the elementary school level ($d = .201$) produced a small-to-moderate significant effect indicating that charter schools had higher reading and mathematics achievement at the elementary level when compared to traditional public schools. Both the middle school level ($d = -1.047$) as well as the high school level ($d = -2.671$) revealed large, negative, significant mean effect sizes that indicated that charter school educational programs are producing lower achievement in reading and mathematics. The final category combining elementary, middle, and high school levels ($d = -0.183$) revealed a small significant negative effect on achievement, indicating that achievement scores in charter schools are lower than traditional public schools. These results demonstrate that when examining the impact of charter schools versus public school education on student achievement results will differ across different student groups with elementary schools demonstrating a small positive impact relative to a large

negative impact found with middle and high school level students. The results for this analysis can be found in Table 3.

Table 3: Student Level

Variables and Categories	Number of Effect Size Measures	With-In Groups Effects	Mean Effect Size
Student Level		184.642*	
Elementary School	78		0.201*
Middle School	12		-1.047*
High School	12		-2.671*
Elementary/Middle/High School	20		-0.183*

Achievement Measure:

Analysis was conducted in an effort to assess the impact of charter versus public school education on student achievement across the type of achievement measure used on student mathematics and reading achievement. Results indicate there are significant differences across the different achievement measures ($p < .001$). The mixed effects analysis broken down by the type of achievement measure includes significantly small negative state assessments ($d = -0.152$) significantly moderate negative district assessments ($d = -0.295$) significantly large regional assessments ($d = 0.747$), and significantly large negative for-profit assessments ($d = -1.815$). The significantly large negative effect found for for-profit assessments, as well as the small-to-moderate effects found at the district and state levels, recognize lower levels of student achievement in charter schools than traditional public schools. Regional assessments, however, result in a significantly large positive effect indicating higher levels of reading and mathematics

achievement within charter schools. These results demonstrate that when examining the impact of charter schools versus public school education on student achievement, results will differ across different achievement with measures. The results for this analysis can be found in Table 4.

Table 4: Achievement Measure

Variables and Categories	Number of Effect Size Measures	With-In Groups Effects	Mean Effect Size
Achievement Measure		115.030*	
State Assessment	66		-0.152*
District Assessment	12		-0.295*
Regional Assessment	24		0.747*
For-Profit Assessment	20		-1.815*

Geographic Region:

Analysis was conducted in an effort to assess the impact of charter versus public school education on student achievement across different geographic regions. Results indicate there are significant differences across the different geographic regions ($p < .001$). The mixed effects analysis broken down by the geographic region in which the sample was assessed include the East North Central ($d = 0.524$) and South Atlantic regions ($d = -2.463$) which produced the largest effects, while the Pacific ($d = -0.364$) and Mountain regions ($d = -0.427$) produced moderate effects. The East South Central region ($d = -0.162$) produced a small effect while the West South Central ($d = 0.080$) and Middle Atlantic ($d = 0.015$) produced no effect.

These results suggest that student achievement in the South Atlantic region had a significantly large negative effect with significantly moderate negative effects in the Mountain and Pacific regions implying that charter school educational programs are producing lower achievement in reading and mathematics. A significantly small negative effect was experienced in the East South Central region indicating that student achievement in the western and southern regions of the nation also experience lower levels of student achievement in charter schools relative to traditional public schools. The East North Central region produced a significantly large effect indicating that charter schools earn higher levels of student achievement in this region. The West South Central region produced no significant effect. These results demonstrate that when examining the impact of charter schools versus public school education on student achievement, results will differ across different geographic regions. The results for this analysis can be found in Table 5.

Table 5: Geographic Region

Variables and Categories	Number of Effect Size Measures	With-In Groups Effects	Mean Effect Size
Geographic Region		119.121*	
Pacific	10		-0.364*
Mountain	8		-0.427*
West South Central	2		-0.080
East North Central	34		0.524*
East South Central	50		-0.162*
Middle Atlantic	4		0.015
South Atlantic	14		-2.463*

Socioeconomic Status:

Analysis was conducted in an effort to assess the impact of charter versus public school education on student achievement across different socioeconomic statuses. Results indicate there are significant differences across the different socioeconomic statuses ($p < .001$). The mixed effects analysis broken down by socioeconomic percentages indicate the following effects: less than 40% SES ($d = -0.293$), 50% to 60% SES ($d = 1.433$), and 80% to 90% SES ($d = 0.072$). According to Cohen (1992), a significant small-to-moderate effect was produced for a socioeconomic population of less than 40 % which implies that student achievement levels for students where 40 % or fewer are identified as having a low socioeconomic status experience lower levels of reading and mathematics achievement in charter schools than traditional public schools. A significantly large effect implies that for a low socioeconomic population between 50 and 60 percent, charter schools are producing higher levels of mathematics and reading student achievement. No effect was indicated for socioeconomic populations between 80 and 90 percent. These results demonstrate that when examining the impact of charter schools versus public school education on student achievement, results will differ across different socioeconomic statuses. The results for this analysis can be found in Table 6.

Table 6: Socioeconomic Status

Variables and Categories	Number of Effect Size Measures	With-In Groups Effects	Mean Effect Size
Socioeconomic Status		59.814*	
Less Than 40% SES	10		-0.293*
50% to 60% SES	12		1.433*
80% to 90% SES	12		0.072

Urban/Rural Ratio:

Analysis was conducted in an effort to assess the impact of charter versus public school education on student achievement across different populations (Urban, Rural). The mixed effects analysis broken down by the urban/rural ratio according to 2010 Census data indicates the following effects: 50% Urban/50% Rural ($d = -0.245$), 70% urban/30% rural ($d = -0.345$), 80% urban/20% rural ($d = 0.139$), and 90% urban/10% rural ($d = -0.442$). When the mean effect size of urban/rural categories are analyzed, there is no significant difference between the effects ($p = 0.247$).

According to Cohen (1992), a significant negative small-to-moderate effect was produced for an urban/rural ratio of 50/50 which indicates that student achievement levels are lower for charter school educational programs where the urban and rural ratio is equally distributed. Urban/rural ratios for both 70/30 and 90/10 produced significantly negative moderately sized effects indicating that charter school educational programs are producing lower levels of academic achievement in reading and mathematics. The 80/20 ratio revealed a significantly small positive effect which suggests higher levels of student achievement among charter school students. These results demonstrate that when examining the impact of charter schools versus public school education on student achievement, results will not differ across different ratios of urban and rural student groups. The results for this analysis can be found in Table 7.

Table 7: Urban/Rural Ratio

Variables and Categories	Number of Effect Size Measures	With-In Groups Effects	Mean Effect Size
Urban/Rural Ratio		5.422	
50% Urban / 50% Rural	1		-0.245*
70% Urban / 30% Rural	79		-0.345*
80% Urban / 20% Rural	12		0.139*
90% Urban / 10% Rural	14		-0.442*

English Language Learners:

Analysis was conducted in an effort to assess the impact of charter versus public school education on student achievement across schools indicating the pressure or absence of English Language Learners (ELL). When the mean effect size of the presence and absence is analyzed, there is no significant difference between presence ($d = -0.125$), and absence ($d = -0.364, p = 0.119$). The mixed effects analysis was broken down by whether the study included ($d = -0.125$) or excluded English Language Learners ($d = -0.364$).

According to Cohen (1992), the inclusion of English Language Learners yielded a significant small negative effect while the exclusion of English Language Learners yielded a significant moderate negative effect. This outcome indicates that traditional public schools obtain lower levels of student achievement than charter schools despite the inclusion or exclusion of English Language Learners achievement scores. These results demonstrate that when examining the impact of charter schools versus public school

education on student achievement, results will not differ if existence of English Language Learners is considered. The results for this analysis can be found in Table 8.

Table 8: English Language Learners

Variables and Categories	Number of Effect Size Measures	With-In Groups Effects	Mean Effect Size
English Language Learners		2.425	
ELL Present	47		-0.125*
ELL Not Present	75		-0.364*

Special Education:

Analysis was conducted in an effort to assess the impact of charter versus public school education on student achievement across schools indicating the pressure or absence of special education. Results indicate there are significant differences across the schools indicating the pressure or absence of special education ($p < .001$). The mixed effects analysis was broken down by whether the study included ($d = -0.700$), or excluded the special education population ($d = 0.114$).

According to Cohen (1992), the inclusion of the special education population yielded a significantly large negative effect while the exclusion of special education yielded a significant small effect. This outcome suggests that special education students experience lower levels of reading and mathematics achievement in charter school educational programs than traditional public schools. These results demonstrate that when examining the impact of charter schools versus public school education on student achievement, results will differ across schools indicating the pressure or absence of special education. The results for this analysis can be found in Table 9.

Table 9: Special Education

Variables and Categories	Number of Effect Size Measures	With-In Groups Effects	Mean Effect Size
Special Education		29.463*	
Special Education Present	56		-0.700*
Special Education Not Present	66		0.114*

Competition:

Analysis was conducted in an effort to assess the impact of charter versus public school education across schools with or without lottery systems (Competition). When the mean effect size of the presence and absence is analyzed, there is no significant difference between presence ($d = -0.065$), and absence ($d = -0.314, p = 0.106$). The mixed effects analysis was broken down by whether the study included ($d = 0.065$), or excluded a lottery for admission indicating competition among students ($d = -0.314$).

According to Cohen (1992), the inclusion of a lottery system produced no effect while the exclusion of a lottery system yielded a significant moderate negative effect. Results suggest that charter school educational programs experience lower levels of academic achievement in reading and mathematics than traditional public schools when competition is present. These results demonstrate that when examining the impact of charter schools versus public school education on student achievement, results will not differ across schools with or without lottery systems. The results for this analysis can be found in Table 10.

Table 10: Competition

Variables and Categories	Number of Effect Size Measures	With-In Groups Effects	Mean Effect Size
Competition		2.613	
Competition Present	14		0.065
Competition Not Present	108		-0.314*

Source:

Analysis was conducted in an effort to assess the impact of charter versus public school education on student achievement across different data sources. Results indicate there are significant differences across the different data sources ($p < .001$). The mean effect sizes of the types of sources used for this study include, dissertations ($d = 0.079$), professional organizations ($d = 0.023$), and colleges/universities ($d = -0.697$) with only colleges/universities revealing a large effect according to Cohen (1992). This significantly large, negative effect indicates that the data collected from colleges and universities yield lower levels of academic achievement for reading and mathematics within charter schools relative to traditional public schools. These results demonstrate that when examining the impact of charter schools versus public school education on student achievement, results will differ across different depending on where the data is drawn from. The results for this analysis can be found in Table 11.

Table 11: Source

Variables and Categories	Number of Effect Size Measures	With-In Groups Effects	Mean Effect Size
Source		20.775*	
Dissertation	14		-0.079
Professional Organization	60		0.023
College/University	48		-0.697*

Publication Year:

Analysis was conducted in an effort to assess the impact of charter versus public school education on student achievement across the publication years of the studies included in the analysis. Results indicate there are significant differences across the different publication years ($p < .001$). The mean effect sizes of the publication year used for this study range from 2001 to 2011, encompassing a decade of No Child Left Behind legislation.

A large effect was revealed for 2005 ($d = 1.433$) indicating that charter school student achievement levels were higher than traditional public school achievement levels. The mean effect for the 2007 publication year ($d = -1.247$) yields a large, significant, negative effect which suggests that charter school student achievement levels were lower than traditional public school achievement levels.

Significant negative moderate effects are evident in both the 2001 ($d = -0.517$), and 2006 ($d = -0.474$) publication years. This result suggests that charter school educational programs produced lower achievement in reading and mathematics compared to traditional public schools. No effect was evident for the 2008 ($d = 0.013$), 2009 ($d = -$

0.008), or 2011 ($d = 0.072$) publication years. These results demonstrate that when examining the impact of charter schools versus public school education on student achievement, results will differ across different publication years. The results for this analysis can be found in Table 12.

Table 12: Publication Year

Variables and Categories	Number of Effect Size Measures	With-In Groups Effects	Mean Effect Size
Publication Year		112.587*	
2001	14		-0.517*
2005	12		1.433*
2006	4		-0.474*
2007	34		-1.247*
2008	32		0.013
2009	14		-0.008
2011	12		0.072

Publication Status:

Analysis was conducted in an effort to assess the impact of charter versus public school education on student achievement across different publication statuses. When the mean effect size of published and unpublished studies is analyzed, there is no significant difference between published ($d = - .279$), and unpublished ($d= 0.015, p = 0.492$). The mean effect size of the published articles ($d = -0.279$) indicates a significant small-to-moderate negative effect. This result implies that published articles yield higher levels of student achievement within charter schools. Unpublished studies ($d = 0.015$) according to Cohen (1992), indicate no effect. These results demonstrate that when examining the

impact of charter schools versus public school education on student achievement, results will not differ across different publication statuses. The results for this analysis can be found in Table 13.

Table 13: Publication Status

Variables and Categories	Number of Effect Size Measures	With-In Groups Effects	Mean Effect Size
Publication Status		0.472	
Published	118		-0.279*
Unpublished	4		0.015

Publication Bias

Publication bias is a concern when performing a meta-analysis, and a criticism of the meta-analytic approach (Wolf, 1986). Publication bias occurs when studies that find significant results for the effect being investigated are more likely to be published than studies that do not find significant findings therefore making it more likely that these studies will be included in meta-analytic investigations. Publication bias has the potential of inflating the effect size estimates (Hedges, 1986), and therefore it is important that unpublished information be included in performing a meta-analysis. This investigation includes ten studies which are published, and one study that is not published.

Egger's Test of the Intercept

Egger's Test of the Intercept was used to assess the presence of publication bias. Egger's linear regression method is intended to quantify the publication bias analyses (Egger, Davey, Schneider, & Minder, 1997). In the Egger test the standard normal deviation is regressed on precision, defined as the inverse of the standard error. The intercept in this regression corresponds to the slope in a weighted regression of the effect

size on the standard error. Power for this test is generally higher than power for the rank correlation method, but is still low unless there is severe bias or a substantial number of effect size measures (Sterne, Gavaghan, & Egger, 2000).

In the current investigation, Egger's test reveals that the intercept is -0.38209, CI_{95} [-4.50519, 3.74101], with $t(120)=0.18348$, ($p = 0.85473$). The non-significant results indicate that publication bias is not a concern with the current group of research studies.

Summary of Meta-Analysis Results

The primary purpose of this meta-analytic investigation was to investigate the impact of charter versus public education on student achievement across a number of moderators. Moderators including publication source and status, the type of assessment, the size and location of the sample, as well as socioeconomic status, English Language Learning, school competition, and eligibility for special education that may impact student mathematics and reading achievement since the inception of NCLB. This meta-analytic investigation, incorporating 11 studies individually, analyzes the effectiveness of 11 moderators against the dependent variable of mathematics and reading student achievement. The tables and analyses above disaggregate data for 122 effect sizes.

It was determined by the meta-analysis that the impact of various moderators on student achievement since the implementation of NCLB is significant ($p < .001$). Also, it was determined by the meta-analysis that the aspects of student level, data source, year of publication, type of achievement measure, geographic region, socioeconomic status, and special education presence all reflect significant results. Publication status, urban/rural ratio, English language learner presence and competition do not reflect significant results.

CHAPTER V

Conclusions and Discussions

Introduction

Over the last decade, the focus on student achievement in America's public schools has dramatically increased. The pressure to perform and show growth in student achievement has been challenging due to increased levels of competition through school choice across the nation. Charter schools are one of the most recent education reform movements designed to increase accountability, innovation, and competition.

Parents and students are challenged to make a choice on which educational avenue is best for their family and must weigh all of the advantages and disadvantages to see which may produce the greatest outcomes and meet the needs of a diverse student population.

This investigation synthesizes 11 studies conducted across the nation at the elementary, middle, and high school level. The results of this investigation will assist parents and educators in making evidence-based decisions while adding to the research supporting educational reform and promoting best practices in both educational models. This study was specifically designed to consider a number of variables in charter schools relative to traditional public schools, including socioeconomic status, English Language Learning, school competition, and eligibility for special education that may impact student mathematics and reading achievement.

The results of this investigation are from a focused group of studies. Each study included met specific selection criteria to ensure that the research compared data from

both a traditional school and a control school. This parameter was built into this investigation in an effort to maximize the validity of the comparison made across the two educational deliveries. Each study that met the inclusion criteria provided a number of different measures of student achievement, thus increasing the reliability of the estimates made from the included research.

The grand mean overall effect size measure ($d = -.270$) ($p < .001$), a significant negative, small to moderate sized effect, according to Cohen's (1992) guidelines for effect sizes (.5 = large, .3 = moderate, and .1 = small). This indicates that students in charter schools performance on these assessment measures is lower in reading and mathematics when compared to traditional public schools reading and mathematics achievement results (Bifulco & Ladd, 2006; Eberts & Hollenbeck, 2001; Gronberg & Jansen, 2005; Horn & Miron, 2000).

These findings are consistent with previous research (Sass, 2006) suggesting that charter schools may potentially achieve at lower rates than traditional public schools if charter schools receive less funding, are operated by less experienced or less qualified officials, provide a peer environment that is less conducive to achievement, or for some other reason, are unable to provide an effective educational program. Researchers also suggest that student achievement levels may be lower in charter schools because of the types of students charter schools attract (Stoddard & Corcoran, 2008; Zimmer, Blanc, Gill, & Christman, 2008; Hoxby & Rockoff, 2004; Henig, Holyoke, Lacireno-Paquet, & Moser, 2002). Charter schools are likely to attract at-risk students by providing a smaller, more intimate educational environment with specialized curricula than the traditional

public school option (Solmon, Paark, & Garcia, 2001; Lacireno-Paquet, Holyoke, Moser, & Henig, 2002).

Analysis was conducted in an effort to assess the impact of charter versus public school education on student achievement across a variety of moderators. The implication of these findings follows.

Primary Moderators

Mathematics and Reading Achievement:

Results from this investigation examining the mean effect size of mathematics and reading suggests that there is no significant difference between mathematics ($d = -.286$) and reading ($d = -.254$). Both subject areas produce basically the same estimate. The mathematics and reading mean effects both produce small-to-moderate negative significant effects consistent with the grand mean effect size measure. These results imply that achievement results in charter schools are lower than public schools across both mathematics and reading achievement with no differentiation of impact on reading achievement relative to mathematics achievement.

These initial results are in line with previous findings that suggest higher achievement levels in traditional public schools (Eberts & Hollenbeck, 2001; Miron & Nelson, 2001). Studies that support higher achievement levels in charter schools may view a small-to-moderate negative significant effect as progress considering the populations and locations that charter schools are most likely to serve (Stoddard & Corcoran, 2008; Zimmer, Blanc, Gill, & Christman, 2008; Hoxby & Rockoff, 2004; Henig, Holyoke, Lacireno-Paquet, & Moser, 2002).

Student Levels:

The current investigation revealed significant differences between charter school and public school student performance, across different levels of students. Large negative significant effects were found for both middle and high school levels indicating lower mathematics and reading achievement in charter school middle and high school students relative to middle and high school public school students. The elementary level, however, revealed a small-to-moderate positive effect implying higher levels of achievement for charter school students from Kindergarten through 5th grade.

A potential explanation for this result could factor into the emphasis on accountability and performance through NCLB. Students enrolled in the middle school and high school levels are the most commonly assessed. Linn (2003) found that attaching high stakes to test results in an accountability system led to a narrowing of the instructional focus of teachers and principals with considerable evidence that teachers placed greater emphasis on material that is covered on a high-stakes test than they did on other material.

These outcomes are in line with research suggesting that at-risk students who are likely to be identified in middle and high school levels are more likely to be attracted to charter schools (Stoddard & Corcoran, 2008; Zimmer, Blanc, Gill, & Christman, 2008; Hoxby & Rockoff, 2004; Henig, Holyoke, Lacireno-Paquet, & Moser, 2002). Elementary level students who have not yet been identified as being at-risk may perform at higher achievement levels in smaller educational programs, with more individualized attention that charter schools may provide. Solmon, Paark, and Garcia (2001) found that charter

schools, particularly at the high school level, became havens for students with special problems, returning former dropouts, and others “referred” to them by traditional public schools. In addition to Solmon, Paark, and Garcia’s findings, and Lacireno-Paquet, Holyoke, Moser, and Henig (2002) found little evidence that market-oriented charters were focusing on an elite clientele, but were less likely than the other types of schools to serve some high need populations. “Rather than skimming the cream off the top of the potential student population, charter schools may be “cropping off” service to students whose language or special education needs make them more costly to educate” (Lacireno-Paquet, Holyoke, Moser, & Henig, 2002, p.1). Researchers found that students who attended charter schools were on average or lower performing than other students at the traditional public school that they left; the performance gap is greatest for black students (National Charter School Research Project, 2005).

Achievement Measures:

The current investigation revealed significant differences between charter school and public school student performance across different types of achievement measures. The studies included in this investigation revealed a small negative significant effect at the state level, a moderate negative significant effect at the district level, and a large negative significant effect at for-profit level assessment measures which imply that these assessments reflect higher levels of mathematics and reading achievement in traditional public schools relative to charter schools. Large positive significant effects indicating higher levels of academic achievement in charter schools relative to traditional public schools were present when regional assessments were the achievement measure.

Much of the research revealing that charter school students who outperform traditional public school students use some type of state test to compare academic achievement contradicts the finding of this investigation (Ball State University, 2004; Comey, 2008; Florida Department of Education, 2009; Hoxby, 2004; McDonald, Ross, & Bol, 2007; Miron, Cullen, Applegate, & Farrell, 2007). Studies using district, regional, and for-profit assessments to measure achievement tend to produce mixed results regardless of the methods used, with some providing positive results, some negative, with null or mixed findings the most common (Buddin & Zimmer, 2005; Chamberlin, 2007; Witte et al., 2007).

Since the implementation of NCLB mandates is the responsibility of each state, a great level of variability from state-to state may create significant differences between assessment measures. As the debate for national academic standards gains attention as a proposed solution, this forthcoming remedy may provide uniformity across the nation limiting assessment variability (Darling-Hammond, 1994).

Geographic Region:

Results from this investigation examining the impact of charter versus public school education across different geographic regions in the United States indicate there are significant differences. These results imply that student achievement in the western and southern regions of the nation experience lower levels of student achievement in charter schools relative to traditional public schools. The East North Central region however, indicates large positive significant effects that charter schools earn higher levels of student achievement in this region relative to traditional public schools.

According to the National Alliance for Public Charter Schools, the East North Central Region has a very high concentration of charter schools with approximately 230 schools in Michigan, 330 schools in Ohio, 220 schools in Wisconsin, 50 in Indiana, and nearly 40 in Illinois (National Alliance for Public Charter Schools, 2010).

Western and Southern regions, however, have high concentrations in individual states with scattered charter school populations throughout the remainder of the regions. According to the National Alliance for Public Charter Schools (2010), California contains the greatest number of charter schools in the country with approximately 800 schools. Arizona contains nearly 500 charter schools, whereas Nevada contains less than 30 schools, Idaho operates approximately 35 schools, and Wyoming has three charter schools. Florida has the most charter schools in the eastern United States with approximately 420 schools, however, a number of states including South Carolina and Tennessee have less than 40 schools. Mississippi and Alabama do not have charter school legislation in place (National Alliance for Public Charter Schools, 2010).

Stoddard and Corcoran (2008) found multiple reasons for the expansion of charter schools in certain areas with the most powerful reason focused on growing diversity in states, districts, and populations. States with districts of higher percentages of African American and college educated adults had a substantially larger amount of students enrolled in charter schools. Another contributor to expansion of charter schools in certain demographics was the graduation rate and achievement of students. The researcher found that the lower the achievement and graduation rate, the higher the charter school involvement.

Socioeconomic Status:

This investigation suggests that student achievement levels for students where 40 percent or fewer are identified as having a low socioeconomic status experience lower levels of reading and mathematics achievement in charter schools than traditional public schools. However, a large positive significant effect suggests that for student populations of higher levels of low socioeconomic status, the effect of charter schools was positive. Results of this investigation suggest that in socioeconomic populations between 50 and 60 percent, charter schools are producing higher levels of mathematics and reading student achievement. No effect was indicated for socioeconomic populations between 80 and 90 percent.

This result supports prior research that most charter schools are located in urban areas where the greatest concentrations of low socioeconomic families are located. As states began to adopt charter school laws, there was hope that these schools would provide school choice for students in low socioeconomic standing (Stoddard & Corcoran, 2008; Zimmer, Blanc, Gill, & Christman, 2008; Hoxby & Rockoff, 2004; Henig, Holyoke, Lacireno-Paquet, & Moser, 2002).

Urban/Rural Ratio:

This investigation suggests that there are no significant differences between the effects of urban/rural categories on student achievement. According to the National Charter School Resource Center (2012), charter schools are leading innovation in cities across the country and increasing access to high-quality educational options in urban neighborhoods. Several urban communities are embracing charter schools as an integral

component of citywide reform initiatives that are designed to improve the quality of public education for all students.

The student achievement levels in this investigation tend to find mixed results. When the urban and rural ration is an equal 50:50 split, a small-to-moderate negative significant effect favors higher levels of reading and mathematics achievement in traditional public schools relative to charter schools. Large negative significant results for both a 70:30 and 90:10 ratio also indicate higher levels of achievement within traditional public schools relative to charter schools; however, an 80:20 ratio supports higher levels of achievement within charter schools relative to traditional public schools.

Stoddard and Corcoran's conclusions indicated that districts with higher percentages of African American and college educated adults had a substantially larger amount of students enrolled in charter schools. Greene, Forster, and Winters (2003) provided an explanation for lower achievement scores resultant to the type of students that charter schools attract. They found that special-focus or alternative schools tended to target students with educational disadvantages; students at those schools typically did poorer in school and performed worse on assessments than their traditional education peers.

According to the Office of Program Policy Analysis & Government Accountability (2005), the average charter school student is academically behind when entering charter schools compared to students remaining in traditional public schools. For this reason, charter school students are less likely to meet grade-level standards compared to students in traditional public schools; however, students who are furthest behind make slightly more progress in charter schools than do students in traditional public schools.

Results show that Detroit City Schools have lost approximately one third of their students to charter schools (Ni & Arsen, 2011). Data indicates that rural districts in Michigan have the lowest average of participation in charter schools due to lack of availability of charter programs in rural areas. Since most students reflect a need for charter schools in the low income urban areas that is where most charter schools have been founded in the state of Michigan.

English Language Learners:

Results from this investigation assessing the impact of charter versus public school education across the inclusion or exclusion of English Language Learners (ELL) indicate there are not significant differences. The inclusion of English Language Learners yielded a small negative significant effect while the exclusion of English Language Learners yielded a moderate negative significant effect. This outcome indicates that traditional public schools obtain lower levels of student achievement than charter schools despite the inclusion or exclusion of English Language Learners achievement scores. These results demonstrate that when examining the impact of charter school versus public school education on student achievement results will not differ if existence of English Language Learners is considered.

A potential explanation for this result could focus on inclusive practices and programs that are offered in both traditional public schools and charter schools that eliminate barriers to learning and welcome all students despite their ability or fluency level. Miron, Cullen, Applegate, and Farrell (2007) state that on the whole, traditional public schools have higher percentages of low income students, students with special education needs, and students who have limited English proficiency. Charter schools

however, target marketing and recruiting efforts to particular cultural profiles that may attract a particular ethnic group.

Fonseca's 2010 study suggested that the growing number of non-English speaking students entering public schools had increased the complex task of teaching and testing children whose first language was not English.

With language acquisition reported to take three, five, eight, or more years (Cummins, 1984), some non-English speakers were expected to participate in the state testing program 2 years after entering a U.S. school which may have hindered the overall academic growth of students, schools, and school districts (Fonseca, 2010).

Special Education:

Results from this investigation indicate there are significant differences when assessing the impact of charter versus public school education across inclusion or exclusion of special education students. The inclusion of the special education population yielded a large negative significant effect while the exclusion of special education population yielded a small negative significant effect which suggests that special education students experience lower levels of reading and mathematics achievement in charter school educational programs than in traditional public schools.

These results support Greene, Forster, and Winters (2003) research claiming that charter schools that offered educational programming that was different than the traditional school model tended to target students with educational disadvantages. Students at those schools typically performed poorly in school and performed worse on assessments than their traditional education peers. According to the Office of Program

Policy Analysis & Government Accountability (2005), the average charter school student is academically behind when entering charter schools compared to students remaining in traditional public schools. For this reason, charter school students are less likely to meet grade-level standards compared to students in traditional public schools; however, students who are furthest behind make slightly more progress in charter schools than do students in traditional public schools.

Competition:

Results from this investigation examining the impact of charter versus public school education across schools with or without lottery systems (Competition) yielded no significant effect. The inclusion of a lottery system produced no effect while the exclusion of a lottery system yielded a moderate negative significant effect which suggests that students in charter school educational programs experience lower levels of academic achievement in reading and mathematics than students in traditional public schools when competition is present.

Research indicates that student achievement in traditional public schools increase when charter school competition is present (Bifulco & Ladd, 2006). The achievement of students in traditional public schools could rise if the competition from charter schools for students and funding enticed traditional public schools to become more productive. According to Gill (2006), charter school advocates claim that charter schools will not only provide greater gains in student achievement to students who enroll but will also foster competition that will lead to increases in the quality of traditional public schools. Central city and low income suburban districts have experienced the greatest decline of

enrollment in traditional public schools due to school choice competition (Ni & Arsen, 2011; Lacireno-Paquet, Holyoke, Moser, & Henig, 2002).

Secondary Moderators

Source:

Analyses conducted in an effort to assess the impact of charter versus public school education on student achievement across different data sources reveal large negative significant effects which indicate that the data collected from colleges and universities yield lower levels of academic achievement for reading and mathematics within charter schools relative to traditional public schools.

Publication Year:

Publication year was examined as a possible secondary moderator of the impact of charter versus public school education across the publication years of the studies included in the analysis which indicated there are significant differences across the different publication years ranging from 2001 to 2011. This time span encompassed a decade of No Child Left Behind legislation.

Moderate negative significant effects were evident in both the 2001 and 2006 publication year with large negative significant effects for the 2007 publication year. These results suggested that charter school educational programs produced lower achievement in reading and mathematics compared to traditional public schools. Interestingly, no effect was evident for the 2008, 2009, or 2011 publication years.

While this investigation does not identify how long the charter schools in this study have been in existence, these results support Sass' (2006) prior research suggesting that new charter schools tend to have lower student achievement levels than the average traditional public school, with charter schools showing improvement over time up to the fifth year of operation. Prior research suggests a possible explanation of this outcome focuses on the establishment of charter schools. The first one to three years, charter schools are focused on becoming viable organizations – the need to find appropriate facilities, resources, curriculum, teachers, and leadership hampers progress in establishing baseline data to be used in measuring student achievement. A number of studies yield similar results to Sass' finding that achievement gains are lower or insignificant during the first year of a charter school's operation, however, statistically significant evidence shows that gains in mathematics and reading levels are made over time between three and six years (Booker et al, 2005; Finch, Baker-Boudissa, & Cross, 2007; Hanushek, Kain, & Rivkin, 2002; Solmon, Paark, & Garcia, 2001; Miron, Coryn, & Mackety, 2007)

Following a large negative significant effect after the 2007 publication year, the investigation leveled off with studies published in 2008 through 2011 having no effect. A possible explanation for this result could focus on an equal playing field being established between the two educational entities. Perhaps after the initial impact and growth of charter schools' provision of school choice for families, established charter schools provided no significant difference relative to traditional public schools. Barr, Sadvnik, and Visconti (2006) found that charter schools were similar to district urban public schools, with pockets of excellence and mediocrity (Akey, Plucker, Hansen,

Michael, Branon, Fagen, & Zhou, 2008; Charter School Performance, 2005; Zoblotsky et al., 2008). Perhaps charter schools, like any new phenomena, are improving over time in their delivery of quality education. The data of this investigation suggests that trend is occurring.

Publication Status:

Finally, publication status was examined as a potential moderator of the impact of charter versus public school education across the different publication statuses indicating there is no significant difference between published and unpublished studies. Published articles indicate a small-to-moderate negative significant effect suggesting that published articles yield higher levels of student achievement within charter schools. Unpublished studies indicate no effect. These results demonstrate that when examining the impact of charter schools versus public school education on student achievement results will not differ across different publication statuses.

Limitations of the Research

Research on student achievement within public schools is limited to the outcome measures available when conducting a meta-analytic investigation. Standardized tests used to collect data often times only provide limited details regarding many moderators. Students qualifying for special education services, for example, are often only identified by the fact that they qualify for services as an exceptional child, not by one of the 13 disability categories under the Individuals with Disability Education Improvement Act of 2004. Students qualifying for free or reduced lunches within schools that meet eligibility criterion to qualify as socioeconomically disadvantaged are only identified as whether or

not they qualify, not to the extent they qualify. Testing variability from state-to-state with various grade levels being tested also creates inconsistencies.

An additional limitation to this study surrounds the lack of knowledge regarding the establishment years for each included charter school program. Research conducted by Bulkley and Fisler (2002) found that charter school programs needed to find appropriate facilities, resources, curriculum, teachers, and leadership before establishing baseline data to be used in measuring student achievement. A number of studies suggested that achievement gains were lower or insignificant during the first year of a charter school's operation, however, statistically significant evidence showed that gains in mathematics and reading levels were made over time between three and six years (Booker et al, 2005; Finch, Baker-Boudissa, & Cross, 2007; Hanushek, Kain, & Rivkin, 2002; Solmon, Paark, & Garcia, 2001; Miron, Coryn, & Mackety, 2007).

Lastly, every state has its own peculiar mix of regulations, barriers to entry, and funding provisions, and all affect the results (Hill et al., 2006, p. 141). Since state wide testing programs are just being introduced during many of the studies included in this investigation, results could vary significantly as charter programs become established educational programs across the nation.

Future Research

The current investigation focuses on studies that were published during time a time span that encompasses a decade of No Child Left Behind legislation. As traditional public schools at this time faced a new era of accountability, many states also met new challenges through competition created by school choice initiatives stemming from

charter schools. Since charter schools are still a relatively new educational option for students, with some states lacking charter school legislation and others revising initial charter laws, future research may be directed to the growth and continued development of charter programs and the students they serve.

Research shows that at-risk students including special education students, English Language Learners, and potential high school dropouts are often attracted to alternatives to the traditional public school model. Perhaps future studies might focus on specific moderators from this study to gain insight into the advantages and disadvantages of both traditional public schools and charter schools for exceptional students, English Language Learners, and students considered at-risk.

As charter schools become more established, academic achievement gains have shown some evidence that charter schools are moving towards equality with traditional public schools. Future research may potentially focus on what trend lines portray as a continually changing landscape of public education as not only brick-and-mortar charter schools grow but cyber charter schools become established as well.

Conclusions

This investigation assessed the impact of charter versus public school education on student achievement across a number of moderators. These moderators include: the student educational level, data source, publication status, publication year, achievement measure, geographic location, socioeconomic status, urban/rural ratio, English Language Learner student population, special education student population, and competition.

A grand mean overall effect size measure revealed a significant negative, small-to-moderate sized effect according to Cohen's (1992) guidelines indicating that charter school educational programs are producing lower achievement scores in reading and mathematics when compared to traditional public schools' reading and mathematics achievement results.

While this investigation supports the claim that charter schools are moving towards equality with traditional public schools as the No Child Left Behind legislation continues, research suggests that school choice initiatives provide educational opportunities for students both in and out of the traditional public school with the decision left to each family to determine which placement meets the individual needs of the child.

Appendices

Appendix A

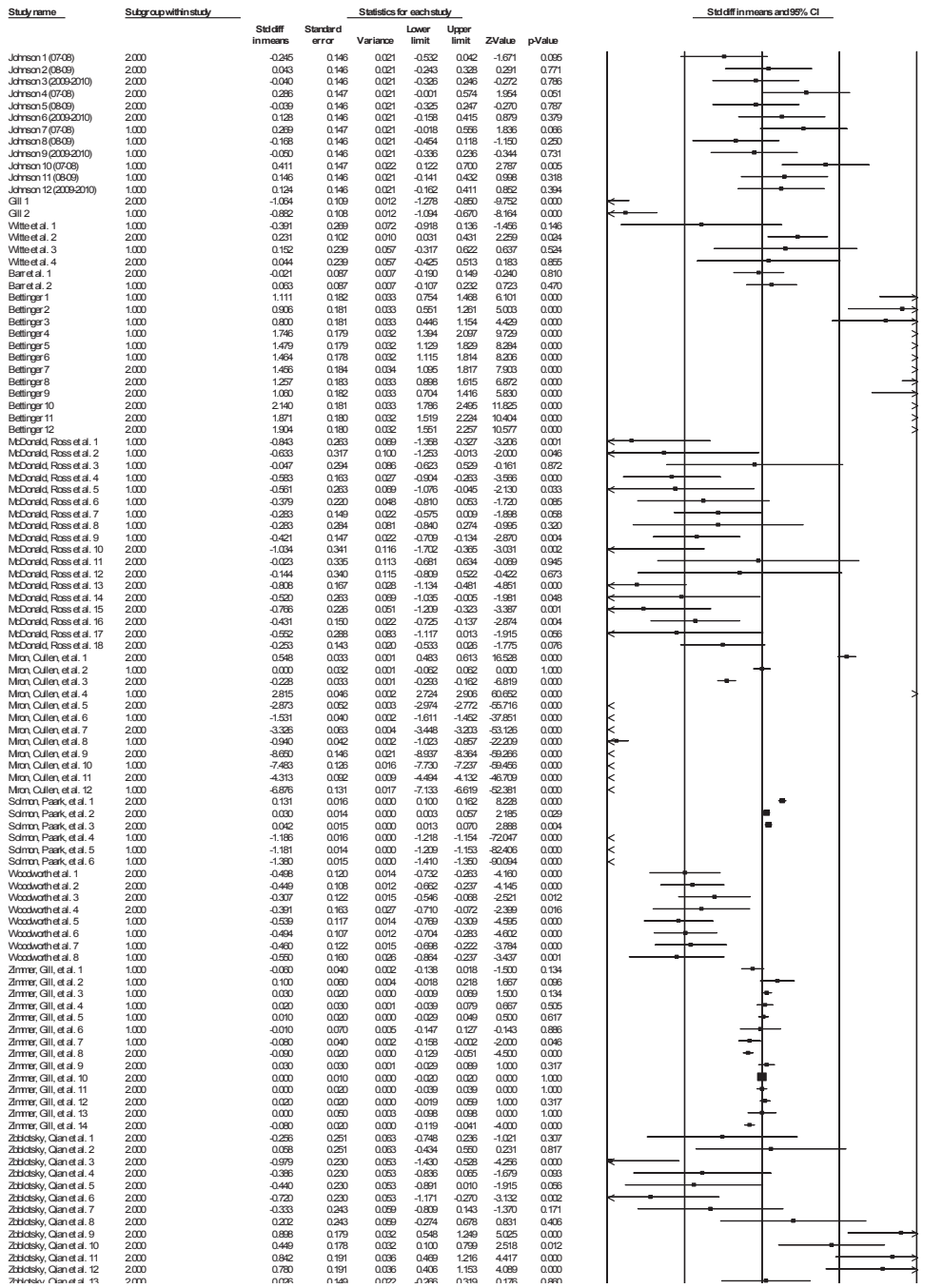
Institutional Review Board (IRB)

The research collection and analysis for this dissertation is a meta-analysis. Considering that the data collected already exists and involves no interaction with human subjects, a Claim of Exemption form was submitted to the Institutional Review Board in August 2012. The following response to the waiver was sent via E-mail in September 2012 by the IRB chairperson, Dr. Cathy Bieber Parrott. “The IRB has determined your project “Examining a Decade of Reading and Mathematics Academic Achievement Among Primary and Secondary Traditional Public School and Charter School Students: A Meta-Analytic Investigation” to not require IRB oversight. Your collection of data from published articles isn’t regulated by IRB even though the original data was collected from human subjects. Best wishes on the completion of your study.”

Appendix B

Study Weights

Meta Analysis



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