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Impact of the Child Development Program on Reading Achievement of Kindergarten Through Eighth Grade Students in an Urban School District

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IMPACT OF THE CHILD DEVELOPMENT PROGRAM ON READING
ACHIEVEMENT OF KINDERGARTEN THROUGH EIGHTH GRADE STUDENTS
IN AN URBAN SCHOOL DISTRICT

by

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DEDICATION

Thank you to all of my family and friends who have given me love and support throughout the years. To my parents, Rivers and Teresa Lynch, thank you for your unwavering encouragement, for the numerous life lessons and morals that you have taught me, and for instilling in me the important value of education. To my fiancé, John Fisher, thank you for your constant words of advice, for your drive to help me complete this journey, and for your witty humor that helped me greatly in times of need. For these reasons and as a token of gratitude, I dedicate this dissertation to my wonderful family and friends.

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ABSTRACT

Educational leaders are charged with making informed decisions regarding various aspects of schooling that affect the overall achievement of students. Numerous legislative ideas, funding initiatives, programming standards, and practicing guidelines for early childhood education programs have been introduced (Buyssee & Wesley, 2006). Early care and education have become significant components of social policy due to the increase in the number of individuals in the workplace and the increasing roles of government in education and reform, as well as the continued concern for school readiness and achievement (Urban Institute, 2009). Americans often state that children are “our most precious natural resource” (Grubb, 1989, p. 358). History, however, has demonstrated that varying changes and restrictions in implementing early childhood education have occurred despite this belief system within the general population.

The *State of America’s Children* (Children’s Defense Fund, 2010) reported that the early years are critical for child development and can be influenced by enrollment in high quality early childhood programs. In the United States, however, a child is born into poverty every 32 seconds, and decreased developmental progress often continues to widen the learning gap between them and their higher income peers. Several research studies have been conducted to measure the immediate and long-term effects of student participation in child development programs and were reviewed by the researcher.

This study examined the impact of early childhood education on the reading achievement of children, kindergarten through eighth grade, who participated in the Child Development (CD) program within Charleston County School District (CCSD) during the 2002-2003 school year. The participating students' achievement was determined by analyzing their performance on the Measures of Academic Performance (MAP) (Northwest Evaluation Association, 1997) assessment, which is conducted at pivotal points within a child's educational career. The treatment students' test results were compared to those of a matched group of students who did not participate in the CCSD Child Development program. The results indicated that the overall program type was an insignificant variable with regard to the MAP reading scores obtained for each sample set at the second, fifth, and eighth grade levels. Additional secondary research questions related to gender, ethnicity, and socio-economic status were further explored.

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CHAPTER ONE

INTRODUCTION

This study proposed to examine the impact of early childhood education on the reading achievement of children, kindergarten through eighth grade, who participated in the Child Development (CD) program within Charleston County School District (CCSD) during the 2002-2003 school year. The participating students' achievement was determined by analyzing their performance on the Measures of Academic Performance (MAP) (Northwest Evaluation Association, 1997) assessment at pivotal points within their educational career. Their test results were compared to those of a matched group of students who did not participate in the CCSD Child Development program.

The study included a review of the history of early childhood education, longitudinal data related to participation in preschool education, and the significance of reading. Finally, an examination and comparative study of the implementation of the four-year-old Child Development program in Charleston County, South Carolina, provided a more comprehensive evaluation of students' sustained achievement through the primary, elementary, and secondary grades.

While contributing to the body of literature regarding longitudinal reading achievement, this study may also assist school leaders and policy makers' efforts within Charleston County to increase each student's school readiness upon entry into kindergarten and to measure the sustained academic achievement performance of this selected group of students. In addition, other stakeholders such as parents, caregivers,

educators, and community members, would benefit from knowing how students who participated in Child Development performed in the area of reading achievement within Charleston County when compared to a cohort group of students. Finally, results of the study could be used to assist in evaluating early childhood educational reform and to maintain the programs regardless of growing economic concerns regarding investment in early intervention programs.

Americans often state that children are “our most precious natural resource” (Grubb, 1989, p. 358). History, however, has demonstrated that varying changes and restrictions in implementing early childhood education and care have occurred despite this belief system within the general population. The concept of extending school to children under the age of six has been discussed within the federal government system in the United States since the twentieth century (Hernandez, 1995). Numerous legislative ideas, funding initiatives, programming standards, and practicing guidelines for early childhood education programs have been introduced (Buissee & Wesley, 2006). The quality and effectiveness of these programs continue to be debated today.

Educational research in the area of early childhood programming has grown significantly over the past 25 years. As American culture and society have changed, so have the educational programs. Five general categories of preschool options are available to parents and caregivers including: 1) the federally funded Head Start Program, 2) in-home care provided by a relative, 3) in-home care provided by a non-relative, 4) the center-based program, and 5) a combination of two or more of these types of different programs (Clark, 2009). Early care and education have become significant components of social policy due to the increase in the number of men and women in the workplace,

the increasing roles of federal and state government in child welfare and in education and reform. Additionally, the continued concern for school readiness and academic achievement also continues to impact social policy as well (Urban Institute, 2009).

In the United States, more than 80% of four-year-old children attend a pre-kindergarten program (National Institute for Early Education Research, 2009). Research has shown that the quality of early childhood care and the educational experiences provided can support higher academic achievement and positive developmental outcomes for students from low income families (Adams, Tout, & Zaslow, 2007). As reported in Conway (2010), the National Institute for Early Education Research has indicated that there is a measured 18-month achievement gap between students living in poverty compared with those who are not living in poverty at their entry into kindergarten. Early intervention and prevention are the keys to long-term developmental and academic success. High quality and affordable child development programs that lay the foundations for future learning are required and necessary in today's society.

Statement of the Problem

The *State of America's Children* (Children's Defense Fund, 2010) reported that the early years are critical for the development of key factors including cognitive, social, and emotional growth for children aged birth to five (p. F-1). Adequate maturity during this time frame can lead to healthy development as well as behavioral and academic success. In the United States, however, a child is born into poverty every 32 seconds; and decreased developmental progress often continues to widen the learning gap between them and their higher income peers for years to come. The challenges faced by children born into poverty -- and which accumulate throughout their lives -- include general health

and wellness, emotional and intellectual development, and academic progress (Children's Defense Fund, 2010). The Children's Defense Fund 'Cradle to Prison Pipeline Campaign' (2009) reported that the cost of poverty to the United States is half a trillion dollars each year. This cost is attributed to the loss of productivity, decrease of health, and increase in crime rates. These findings suggest that poverty, disproportionately based on race, and lack of prevention/early intervention are the key contributors to the continued 'pipeline' downfall within the United States (Children's Defense Fund, 2009).

According to the Children's Defense Fund (2009), however, children enrolled in high quality early childhood education programs are "more likely to complete higher levels of education, have higher earnings, be in better health and be in stable relationships, and are less likely to commit a crime or be incarcerated" (p. 1). Yet, recent nationwide data collected by the Children's Defense Fund in 2010 found the following:

- More than 20 percent of children under the age five are poor; more than 40 percent of these children are Black and more than 33 percent are Hispanic children.
 - More than 63 percent of mothers of young children are in the labor force.
 - In 20 states, a family must have an income that is below 75 percent of the poverty level to receive a public child care subsidy.
 - The annual cost of child care for a 4-year-old is more than the annual in-state tuition at a public four-year college in 36 states and the District of Columbia. In five of these states, it is at least twice the cost.
 - In 2008, fewer than ten percent of all child care centers and less than one percent of all family child care homes were accredited.
 - Thirty-eight states had state-funded pre-kindergarten programs in 2008-2009 but served only 25.4 percent of 4-year-olds and 3.7 percent of 3-year-olds.
 - Only eight states and the District of Columbia require 5-year-olds to be enrolled in school. Two states do not require school attendance until the age of eight.
 - The median salary for preschool teachers is only half that of kindergarten teachers.
- (Children's Defense Fund, 2010, pp. F1-F16)

Specifically in South Carolina, based on federal regulations and guidelines, one in five children, or 21 percent, is poor. During the 2006-2007 school year, 19.9 percent of three-year-olds and 54.3 percent of four-year-olds were enrolled in state-funded preschool programs (Children's Defense Fund, 2009). South Carolina ranked within the top 10 states serving 4-year-old children during the 2008-2009 school year; yet, the overall percentage of students served in South Carolina state-led preschool programs decreased to 38 percent (Barnett, Epstein, Friedman, Sansanelli, & Hustedt, 2009). Barnett et al. noted that this trend of decreased enrollment of approximately one percentage point compared to the 2007-2008 school year was also measured nationally during the 2008-2009 school year when compared to the typical increase by approximately two percentage points in previous years. The overall effect of the recession on state funded pre-kindergarten programs has led to decreased access, lower quality standards, and overall diminished resources.

Due to the recent societal trends, decreased funding in state budgets is inevitable (Barnett et al., 2009). Funding issues, coupled with weak state standards and questions regarding the effectiveness of programs, will only increase the large achievement gap that is often measured between students of various racial and economic statures. The federal government and individual states have responded to these issues through the implementation of *Good Start, Grow Smart* (Bush, 2002) and No Child Left Behind (2002) and, specifically in South Carolina, through the findings of the South Carolina Educational Oversight Committee (Brown & Potter, 2003). Strong leadership decisions will be needed to ensure that high quality educational standards coupled with adequate funding are in place for child development programs to impact the long-term

effectiveness of student achievement (Barnett et al.). The foundation for long-term school success has been linked to the implementation of effective preschool programs (Barnett, Lamy, & Jung, 2005). State funded preschool programs may improve a child's immediate and sustained success in school (Barnett, 2004).

The examination of the Child Development programs in Charleston, South Carolina, provided a more comprehensive study of students' sustained achievement in the area of literacy through the primary, elementary, and middle school grades. In 2008, Charleston County School District created the *Charleston Achieving Excellence (CAE) Plan* as an addition to the *Charleston Plan for Excellence*. The *Charleston Plan for Excellence* was a district initiative that increased school choice options, provided facility improvements, created innovative literacy, child health, and fine arts partnerships, and focused on data-driven decision-making procedures including a coherent curriculum and the "Excellence is our Standard" belief that all children can achieve. The *Charleston Achieving Excellence (CAE) Plan* is a three-year vision that seeks to 1) elevate the achievement of all students, 2) close the achievement gap, and 3) increase the graduation rate. The district identified three core values [*Results, Access, and Partnerships*] that provide the foundation for the *CAE Plan*. This research study will assist district leaders in the evaluation of the *CAE* by specifically adding to the body of knowledge in Charleston County School District related to the core values of *Results: Rigor and Relevance* and of *Access: Equity and Choice* as well as to the *Partnerships: Respect and Relationships* core values of the *CAE*.

In the core values area of Results, this study will provide the district with valuable data related to the long-term reading achievement results of students who participated in

the CCSD Child Development Program through the specific analysis of student performance on a nation-wide assessment at pivotal years within the child's educational career. To address the Access core value, this study will seek to provide parents of potential students and community stakeholders within Charleston County more knowledge regarding the possible long-term educational benefits of participation in the district-provided 4-year-old Child Development program. This may assist those parents who are seeking choice options for their 4-year-old student between possible enrollment in the CCSD Child Development program or in parentally placed private child development centers. Finally, through the Partnership core value, this study will help foster continued respect and relationships between the district and colleges/universities within South Carolina who are seeking permission for data to assist with research projects.

The results of the study closely align with the *Charleston Achieving Excellence Plan* by evaluating the reading achievement of students who participated in the Child Development program through the analysis of a selected group of students' performance on a nationally administered assessment. Analysis of the achievement gap in CCSD among socio-economic status, gender, and race was also conducted. Further, this research study will add to the body of literature which continues to assess the benefits of early childhood education and its impact on increasing the overall graduation rate by specifically analyzing the performance of students within CCSD during the primary, elementary, and middle school years. There is also the potential for future research studies to measure the actual graduation rate of these students after their twelfth grade school year.

The Leadership Connection

Educational leaders are charged with making informed decisions regarding various aspects that affect the overall achievement of students. These leaders attempt to seek balance between the management and leadership sides of academia. Viewing the issues through the structural, human resource, political, and symbolic frames can help leaders decipher alternative approaches to the challenging decision making process that often occurs in the educational setting (Bolman & Deal, 2003). Research by Tryjankowski (2005) has shown that the developmental needs and learning styles of preschool age children are unique and challenging for school administrators. And more specifically, that little is known about the types of academic and professional characteristics required of school administrators in early childhood education programs (Tryjankowski, 2005). Despite good intentions, educators and administrators at times make instructional decisions that may compromise the learning experiences required for children to become engaged and successful readers (Allington & Gabriel, 2012).

The Balanced Leadership Framework is a resource for school leaders that was created through a meta-analysis of research from Mid-continent Research for Education Learning (McREL) (Waters & Cameron, 2007). The data that were analyzed identified 21 primary responsibilities that are necessary for educational leaders to implement in school improvement initiatives. The McREL organization has completed various studies that serve as a guide for “what” educators can do to increase student achievement. Waters and Cameron stated “that simply knowing *what* to do is often not enough to transform schools and classrooms. Leaders also must know *why* certain practices are important, *when* they should be used, and *how* to apply them skillfully in their own

schools and classrooms (p. 1). Because of this, educational leaders are charged with reviewing research on the effectiveness of their programs with regard to overall short term and long term student achievement. Of the 21 primary responsibilities identified in the meta-analysis, the following responsibilities closely align with this research study and support the basis for how this research ties into the educational leadership connection: *involvement in curriculum, instruction, and assessment, focus, knowledge of curriculum, instruction, and assessment, outreach, affirmation, change agent, and monitors/evaluates* Waters & Cameron, pp. 4-9).

Research Questions

- (1) How do children who participated in the Charleston County School District (CCSD) Child Development (CD) program during the 2002-2003 school year compare to a matched sample of non-Child Development students at the end of their second grade year as measured by the Measure of Academic Performance (MAP) Reading assessment?
 - a. Do the results vary when data are disaggregated by socio-economic status for the students who participated in the Child Development program?
 - b. Do the results vary when data are disaggregated by race for the students who participated in the Child Development program?
 - c. Do the results vary when data are disaggregated by gender for the students who participated in the Child Development program?
- (2) How do these same CD students compare to the same matched sample of non-Child Development students at the end of their fifth grade year as measured by the Measures of Academic Performance (MAP) Reading assessment?

- a. Do the results vary when data are disaggregated by socio-economic status for the students who participated in the Child Development program?
 - b. Do the results vary when data are disaggregated by race for the students who participated in the Child Development program?
 - c. Do the results vary when data are disaggregated by gender for the students who participated in the Child Development program?
- (3) How do these same CD students compare to the same matched sample of non-Child Development students at the end of their eighth grade year as measured by the Measures of Academic Performance (MAP) Reading assessment?
- a. Do the results vary when data are disaggregated by socio-economic status for the students who participated in the Child Development program?
 - b. Do the results vary when data are disaggregated by race for the students who participated in the Child Development program?
 - c. Do the results vary when data are disaggregated by gender for the students who participated in the Child Development program?

Definition of Terms

Alphabetic Principle: the combination of alphabetic understanding and phonological recoding skills through phonics instruction (Center for the Improvement of Early Reading Achievement, 2000)

At-risk Students: for the purposes of this study, children who are in jeopardy of not achieving academic standards due to poverty and cognitive delays (South Carolina Department of Education, 2007)

Big Five Areas of Reading: the findings of the National Reading Panel Report (National Institute of Child Health and Human Development, 2000) that resulted in the delineation of five specific areas (alphabetic principle, fluency, phonemic awareness, phonics, and vocabulary) for beginning readers that are necessary components for effective reading instruction

Center Based Program: the type of care provided in a public or private building other than that of the Head Start program (Clark, 2009)

Cohort Reading Achievement Group: for the purposes of this study, the matched sample of students from within Charleston County School District of the same age as the selected target group who did not participate in the Child Development Program

Developmental Indicators for Assessment of Learning, Third Edition (DIAL-3): an individually administered screening developmental assessment that evaluates concept, motor, and language skills through direct assessment and self-help and social skills through parent interviews (Mardell-Czudnowski & Goldenberg, 1998)

Economically Disadvantaged: students who are eligible for free or reduced-price lunch according to guidelines that are derived from annual parent income at or below the federally established poverty line (National Center for Children in Poverty, 2007)

Fluency: the ability to read connected text with speed and accuracy (Center for the Improvement of Early Reading Achievement, 2000)

Formal School: public or private school education for students in kindergarten through twelfth grade (Clark, 2009)

Head Start: a federally funded program sponsored by the United States Department of Health and Human Services for preschool aged children from low-income families (Clark, 2009)

Measures of Academic Performance (MAP): a computer-based assessment given to students typically three times per year in kindergarten through second grade (MAP Primary) and second grade through eleventh grade (MAP) in the areas of reading, mathematics, language, science, and/or social studies (Northwest Evaluation Association, 1997)

National Institute of Early Education Research (NIEER): an independent research and technical assistance organization that is committed to support high quality, effective, early childhood education for children (National Institute for Early Education Research, 2009)

Palmetto Achievement Challenge Test (PACT): the Palmetto Achievement Challenge Test (PACT) is a standards-based accountability measurement of student achievement in four core academic areas - English language arts (ELA), mathematics, science, and social studies for students in third through eighth grades. Students' performance in these areas are coded as: below basic, basic, proficient, and advanced. The individual assessment items are aligned with the South Carolina academic standards (South Carolina Department of Education, 2008)

Phonemic Awareness: the ability to hear and manipulate the sounds in spoken words (Center for the Improvement of Early Reading Achievement, 2000)

Phonics: the acquisition of letter-sound correspondences in reading and spelling (Center for the Improvement of Early Reading Achievement, 2000)

Phonemes: the individual sounds of letters (Center for the Improvement of Early Reading Achievement, 2000)

Pre-Kindergarten Program: a state funded four-year-old child development program that is available to students who qualify based upon entry criteria including developmental performance, income level of parent, primary language, and the educational level of the mother (South Carolina Department of Education, 2007)

Preschool Educational Experience: the education of students aged birth to five in a structured environment either within the home, formal school, or a center (Clark, 2009)

Reading: the ability to recognize printed or written symbols for the intent of finding meaning and understanding (Clark, 2009)

School Readiness: generally refers to child development in the following five domains: physical well-being and motor development, social and emotional development, approaches to learning, language development, and cognition and general knowledge (Child Care & Early Education Research Connections, 2013)

Socioeconomic Status: a person's societal status as measured by income levels, relationship to the national poverty line, educational achievement,

neighborhood of residence, or home ownership (Centers for Disease Control and Prevention, 2010)

Title One Schools: individual schools that receive specific Title One federal funding based on a total of 40% of the student enrollment who are classified as low-income families. Title One schools were originally enacted in 1965 under the Elementary and Secondary Education Act which was created to close the achievement gap between low-income students and other students (U.S. Department of Education, 2009)

Delimitations of the Study

For the purposes of this study, a specific time frame was chosen to include children who were enrolled in Charleston County School District during the 2002-2003 school year until completion of their eighth grade year during the 2011-2012 school year. Participants in this study must have been 4 years old and enrolled in the Charleston County School District Child Development program during the 2002-2003 school year or enrolled in kindergarten during the 2003-2004 school year with sustained enrollment through their eighth grade 2011-2012 school year. The location of the study was also specific to Charleston County School District due to the availability of specific data of various locations and programs within Charleston County School District.

Duplication of the Study

While this study specifically is designed for the students who were enrolled in Charleston County School District during the 2002-2003 school year until completion of their eighth grade year during the 2011-2012 school year, duplication of the nature of this study could occur within any school district. Districts which maintain archival data of

students enrolled in their Child Development program, including specific demographic data of race, gender, and socio-economic status, could duplicate this study by creating a matched sample of kindergarten students whose demographic data are similar to that of the Child Development students' information. Achievement data analysis could occur through the measurement of individual student performance on the duplicating school district's nationally-normed chosen assessment and said specified grade levels. In Charleston County, district leaders chose to administer the Measures of Academic Performance (MAP) assessment at specific grade levels. Additional nationally-normed assessments are available and could be analyzed using the same data analysis procedures as this study to determine if there is a statistically significant difference in reading performance between the students who participated in the CD program when compared to the matched sample of students who did not participate in the CD program at the second, fifth, and eighth grade levels.

Organization of the Study

The remainder of the study is organized into four additional chapters, references, and appendices. Chapter Two presents a review of the history of early childhood education, longitudinal data related to participation in preschool education, and the significance of reading achievement. Chapter Three describes the research design and methodology of the study. This chapter also explains the instrumentation materials, procedures, and the sample for the study. Chapter Four provides a thorough analysis of the data collected and includes discussions regarding those findings. Finally, Chapter Five includes the summary, conclusions, and recommendations from the study.

CHAPTER TWO

LITERATURE REVIEW

This study proposed to examine the impact of early childhood education on reading achievement of children, kindergarten through eighth grade, who participated in the Child Development (CD) program within Charleston County School District (CCSD) during the 2002-2003 school year. The participating students' achievement was determined by analyzing their performance on the Measures of Academic Performance (MAP) (Northwest Evaluation Association, 1997) assessment at pivotal points within a child's educational career. The treatment students' test results were compared to those of a matched group of students who did not participate in the CCSD Child Development program. An examination and comparative study of the implementation of the four-year old Child Development program in Charleston County, South Carolina, provided a more comprehensive evaluation of students' sustained reading achievement through the primary grades.

Introduction

Reading achievement in the primary grades is possibly the most important responsibility of educators in kindergarten through fourth grades (Mathes et al., 2005). Snow, Burns, and Griffin (1998) have suggested that reading is the primary building block for the greater part of all potential learning experiences. The instructional components through which students acquire literacy are based on a complex set of developmental factors that continue to be debated by educational researchers (Leslie &

Allen, 1999). The achievement of successful reading skills is typically established in the early grades and is influenced by the instructional practices that are used during this critical learning period (Mathes et al., 2005). Hsin (2007) stressed the importance of children learning to read in the primary grades as a necessary component in later reading to learn skill development.

For some children, learning to read is easy to internalize because they have experienced many literacy-related activities provided by appropriate modeling and scaffolding of reading behaviors by adults around them. On the other hand, at-risk students often experience significantly fewer opportunities for literacy-enriched activities and are less likely to develop automatic and intrinsic reading skills (Leslie & Allen, 1999). Controversy over the definition of reading readiness and the factors that place a student at-risk within the area of reading proficiency continues to exist despite numerous research studies and instructional practices. Aspects such as cultural demographics, language usage, and economic status are often considered as contributing to at-risk development (Rodgers, Gomez-Bellenge, Wang, & Shulz, 2005).

Leslie and Allen (1999) indicated that “the downward spiraling of reading achievement has been proposed as a major determinant of school failure” (p. 404). The ability to read text is vital for independence in one’s daily life; however, the number of students with reading difficulties in the United States is disturbing. Continued concern for the reading abilities of students in the United States has led to increased research efforts and specific educational implications in the areas of early reading curriculum, instruction, and assessment (Wixson & Dutro, 1999).

Individual student growth disaggregated by race continues to be well documented in the research. Rodgers et al. (2005) indicated that the achievement gap between various demographic groups can be observed as early as the kindergarten school year. Research, as reported by Hsin (2007), indicated that more than 70% of poor readers have difficulties in phonological awareness when in kindergarten. These deficits, as well as continued reading difficulties, have predicted long-term reading failure into the fourth grade. Juel (1988) indicated that 88% of children who scored in the lowest quartile in reading comprehension at the end of first grade remained below the 50th percentile at the end of fourth grade. Numerous studies conducted over the past 25 years have focused on the prevention of developmental reading delays and early intervention for students at-risk for reading problems. Results have suggested that early instruction during the primary grades can be effective in preventing reading difficulties (Mathis et al., 2005). It is, therefore, imperative that administrators and educators implement effective instructional and procedural practices during the early childhood school years to address pre-reading weaknesses in an effort to reduce the long term reading deficits that have been measured in the past.

The History of Reading in the United States

Reading instruction has drastically changed since the printing of the first book, *The New England Primer*, which was specifically designed for the American colonies to teach alphabet verses with religious and moral meaning (Martinez & McGee, 2000). Snow, Burns, and Griffin (1998) have suggested that reading is the primary building block for the greater part of all potential learning experiences. Conversely, the way in

which reading instruction is taught has changed throughout the history of academic instruction in the educational system.

Martinez and McGee (2000) reviewed the past, present, and future instructional practices of teaching reading in the United States. The authors indicated that the time period from 1607 to 1776 was coined “The Period of Religious Emphasis in Reading Instruction” by Nila Banton Smith, an educational researcher who studied the history of reading (Martinez & McGee p. 156). During this time, instruction related to reading and the understanding of biblical passages was taught. It was determined that only one children’s literature book was written during this time that included three fictional stories. The next time period (1776-1840) was identified as the “Nationalistic-Moralistic Emphasis” phase (Martinez & McGee p. 157). The focus of instructional material was strongly influenced by the nationalistic aims of the country. The most widely used book, *The American Spelling Book*, included very little literature- based material (Martinez & McGee).

The “Period of Emphasis Upon Education for Intelligent Citizenship” from 1840-1890 followed the “Nationalistic-Moralistic Emphasis” period. Written information during this time focused less on the patriotic and moralistic reading material and centered on the expected duties of an American citizen (Martinez & McGee, 2000, p. 157). Professional books on teaching, which first appeared during the 1890 to 1910 time period called the “Period of Emphasis Upon Reading as a Culture Asset,” included a more literature-enriched emphasis in reading. It was noted that during this time, teachers were encouraged to use supplemental materials that provided older students with access to

classic novels while younger students were given short stories to vary their instruction. Nursery rhymes were also written down and added into books for younger students.

After 1910, instruction in the area of reading changed into the “Initial Period of Emphasis Upon Scientific Investigation in Reading” (Martinez & McGee, 2000, p. 157). The context in which reading instruction occurred reflected what researchers understood about the scientific nature of reading text rather than the general educational goals of society. During this period, two distinct fields of reading instruction emerged: instruction that focused on the specific nature of reading versus the instruction that focused on the emergence of literature. As time progressed, reading research increased within each school of thought. Scientific research led to changes in the information presented in reading materials. Selections in basal readers included pre-primer and readiness materials, word lists for story vocabulary terms, a reduction in preprimer and primer vocabulary, and the increase in repetitive vocabulary terms (Martinez & McGee).

During the 1950s, stories created for basal readers typically included white, middle class suburban families who were specifically created by the publishing companies. Critiques during the 1960s led to cultural changes in the stories and pictures being printed; however, the content and context of the information presented remained stable for the remainder of the 20th century. During the 1980s, research conducted on the information contained within the basal revealed that literature-based stories were infrequently included in the textbook. If works of literature were included, they were gross adaptations or modifications of the original story (Martinez & McGee, 2000). This led to dramatic changes in reading materials during the 1990s. Calls for literature-based reading instruction from specific states forced publishing companies to adapt and change

the material included in reading textbooks. In addition, five trends in children's literature began in the 1990s and have continued to date. These five trends include books created to support 1) beginning reading, 2) sustained and expanded beginning reading, 3) the transition from picture books to more complex chapter books, 4) books with historical and naturalistic themes, and 5) the diversity of children and experiences (Martinez & McGee).

Big 5 Ideas of Reading Instruction

Research studies conducted over the past 25 years led to the creation of a specific pedagogical framework in 2000 that is currently used to guide reading instruction (Mathis et al., 2005). The report from the National Reading Panel (National Institute of Child Health and Human Development, 2000) identified 5 Big Ideas for beginning readers that are necessary components for effective reading instruction. These included phonemic awareness, alphabetic principle, fluency with text, vocabulary, and reading comprehension. In the context of improving student reading achievement, this theoretical framework parallels the findings in research that addressed students' learning and the integration of specific reading components (Mellard, Byrd, Johnson, Tollefson, & Boseche, 2004).

Phonemic Awareness. Phonemic awareness is defined as the ability to hear and manipulate the sounds in spoken words (Center for the Improvement of Early Reading Achievement, 2000). It also includes the understanding that spoken words and syllables are made up of meaningful sequences in speech sounds. Phonemes are the smallest parts of sound in a spoken word that has meaning. Phonemic awareness is an important part of

early literacy development in that it helps teach children to learn to spell words and assists in improving a child's word reading and reading comprehension development.

Alphabetic Principle. The alphabetic principle is taught through phonics instruction. Specific instruction in phonics helps children learn the systematic and predictable relationships between the written letters and the sounds of language (Center for the Improvement of Early Reading Achievement, 2000). Appropriate instruction in phonics can significantly improve word recognition, spelling, and reading comprehension skill development.

Text Fluency. Fluency, as defined by the Center for the Improvement of Early Reading Achievement (2000), is the ability to read text accurately and quickly. Effortless fluency in reading is believed to assist in the establishment of the connections between word recognition and reading comprehension.

Vocabulary. Vocabulary is defined as the ability to communicate effectively through words. Vocabulary can be segmented into two specific categories: oral vocabulary that includes listening and speaking and reading vocabulary that refers to reading and writing words in print form. Vocabulary is an important part of reading development because beginning readers use their oral skills to make sense of words in print. Readers also develop an understanding of words in print which then can translate into adequate comprehension of the material read (Center for the Improvement of Early Reading Achievement, 2000).

Comprehension. Finally, the Center for the Improvement of Early Reading Achievement (2000) defines text comprehension as the main reason for reading. It is explained as a purposeful and active task that can be taught by helping readers

understand, remember, and communicate with others what they have read. Effective readers use metacognitive strategies while reading. Metacognition is defined as thinking about thinking (Center for the Improvement of Early Reading Achievement, 2000). The appropriate use of comprehension-monitoring techniques while reading can assist in the metacognitive development of readers before, during, and after the act of reading.

Information from scientific research conducted by the National Institute of Child Health and Human Development (2000) indicated that specific instructional practices based on the principles outlined above can help build the foundation of effective reading instruction. Mathis et al. (2005) reported that reading instruction should be explicit. The authors defined explicit as the means of sharing new knowledge directly with the student rather than requiring the student to infer new knowledge. Mathis et al. also indicated that for some students, reading instruction must be intensive in order to assist in adequate reading skill acquisition. Intensive instruction is defined as instruction in which the “students are highly engaged in learning critical content and that the ratio of teacher to students is relatively small” (p. 151). Present day instruction, which is reviewed in the following section, has attempted to learn from the history of the past and has changed the way in which reading is taught to children of all ages.

Present Day Reading Instruction

Specific changes in curriculum and instruction, special education laws and regulations, and overall instructional practices have continued to build upon the framework established in the latter part of the 20th century with regard to reading instruction into the 21st century. In addition to research-driven practices, increased accountability standards imposed by the state and federal governments have led to more

specific awareness in the area of reading instruction and achievement (Wixson & Dutro, 1999). Standards-based reform and practices were initially implemented in the 1980s and have continued to date. The goal of reform efforts has changed from teaching-based instructional techniques to learning-based instructional techniques. Due to this change, increased emphasis on competence levels of performance have been established in relation to content standards (Wixson & Dutro, 1999).

The history of reading instruction within the United States has evolved over time into a complex combination of literacy-enriched activities with a focus on specific reading skill-based instruction. While the debate over explicit reading practices and instructional techniques continues, the goal of reading achievement, as established through standards-based competency levels, continues to be difficult for students to attain. Mathes and Torgesen (1998) indicated that “average reading achievement has not changed markedly over the last 20 years” thus suggesting that the reform efforts chosen or enforced have not demonstrated an impact on actual student performance (p. 318). The need for change in reading practices that include explicit and intensive instructional techniques with measurable growth and goal achievement is required in order to increase overall reading achievement in the United States. Specifically, the identification of those students in need, before these deficits are practiced, is crucial for the early identification and intervention of reading difficulties of students in the United States in order to address the reading issues currently impacting society.

Students At-Risk for Reading Difficulties in the United States

The history of reading instruction within the United States has dramatically changed over the past few centuries. One thing, however, that has remained constant is

the difficulty in teaching some children how to read with standard reading materials and instructional practices. Mathes and Torgesen (1998) stated that “reading achievement has not changed markedly over the last 20 years,” thus suggesting that the reading restructuring procedures have done little to impact actual performance for those students who are at-risk for reading failure (p. 318). Reading is a critical and necessary skill for future success and independence; however, research has shown that young children frequently struggle with the development of the essential components of reading as outlined in the Big 5 Ideas of reading development (Center for the Improvement of Early Reading Achievement, 2000). Campbell (2004) noted that this is an unfortunate trend considering the documented research that suggests that reading deficits can be prevented. While efforts have been made to address these issues, it is vital that researchers continue to evaluate the successful development of reading skills through explicit and intensive intervention programs and instructional practices that seek to prevent or remediate reading skill difficulties before significant deficits are measured.

History of Early Childhood Education Programs in the United States

During the middle of the 20th century, most children lived in a two-parent family in which the father worked and the mother cared for the children at home. Hernandez (1995) reported that in 1940, 87% of young children under the age of six were cared for by a non-employed parent in the home setting. By 1989, however, that statistic had decreased to 48%. During that time, there was a growing prevalence of dual-earner families within the work force, from 5% to 38%. At this same time, the number of children living within a single-parent household also increased from 2% to 13%. Therefore, from 1940 to 1989, the overall percentage of children who required child care

rose from 8% to 51% (Hernandez). This growing need for child care for preschool age children was clearly evident in the new prevalence of dual-earner families and single parent families who were employed.

Changes in the type of jobs offered which resulted in life pattern changes also influenced the growing need for early childhood development programs. Agriculture and the two-parent, farm family were the primary form of economic stability. In these households, families worked together to support their way of living, and child care was combined with living the farming way of life. With the introduction of the Industrial Revolution, families moved into the city in order to obtain urban jobs, which in most instances included higher pay. With this change to a more urban lifestyle, history has also shown that the overall size of families decreased during this time period. The introduction of child labor laws reduced the number of children eligible to obtain jobs and thus also decreased the overall family income and ability to care for one another (Hernandez, 1995).

As the general population changed from the agricultural way of living to the industrial lifestyle, school enrollment rates also increased dramatically due partially to the enforcement of compulsory school attendance and child labor laws (Hernandez, 1995). The charity schools, which were first created by philanthropists, were started in an effort to teach children political and moral education due to the belief that parents had overall inadequate parenting skills. During the 1830s and 1840s, infant schools began by removing poor children as young as 18 months old away from their ‘harmful parents’ (Grubb, 1989). This idea shifted as the population changed its thoughts and became more supportive of the mother’s role in caretaking for her own children. The idea of

kindergarten was first initiated in the 1880s and also was formulated based on the movement to teach poor children the “values of industriousness, cleanliness, discipline, and cooperation” (Grubb, p. 361). Day nurseries, often established in settlement houses, were also created during this time to assist working mothers. The negative connotation of working mothers led to the decline in day nurseries, but the underlying idea behind helping the poor persisted (Grubb). By 1920, nursery schools emerged with a different philosophy intact. Instead of replacing the mother in the childcare environment, nursery schools thrived on the idea that their services complemented mothering and catered to the cognitive enrichment of middle-class students. These programs were half-day and were considered a developmental model of early childhood programming rather than the custodial programs of the past (Grubb).

During the Depression and World War II, numerous day-care centers were funded through federally governed initiatives; however, the programs were closed after the war ended. Kindergarten programs within the school setting remained, and the notion to extend schooling to younger children began to impact governmental decisions at that time. The Educational Policies Committee of the National Education Association recommended in 1945 that programs be extended to children aged three and four years old (Grubb, 1989); however, the idea of the mother providing the primary childcare continued to influence policy makers. During the 1960s, a surge of public information regarding developmental stimulation and the effects of early intervention led to increased awareness and policies. The awareness of the impacts of poverty on child development led the federal government to take action as well, leading to the federally-funded Head Start program and other proposed four-year-old programs for all children. There was a

division in programming during this time period between the more developmentally appropriate approaches versus the welfare custodial program point of view (Grubb).

Significant changes in the offering of early childhood programs occurred during the 1970s. Legislative movements were introduced in 1971, 1975, 1976, and 1979. Most of the proposals were defeated due to issues regarding federal funding and due to conflicting views between early childhood providers and elementary certified teachers. During the 1980s, continued political interest in child development programs led to legislative movements in many states. South Carolina was among the first states to provide additional funding for pre-kindergarten programs. The initiative, during that time period, was spearheaded by both citizens and educators, which was not common during the 1980s (Grubb, 1989). By 1989, approximately 40% of preschool-aged children were under the care of an adult other than their parents (Hernandez, 1995).

The shift to providing adequate developmentally appropriate child care programs occurred during the 1990s. The focus on school readiness transpired during 1991 when the National Education Goals Panel established six educational goals for all students. The first goal was specifically created for the early childhood field. It focused on the establishment of an appropriate developmental spectrum of readiness prerequisite standards that included physical and motor development, social and emotional development, and creative approaches to learning, language, cognition, and general knowledge (Buisse & Wesley, 2006). A secondary proposal passed in 1998 also called for the need for the United States to have “ready schools” that could meet the differentiated learning styles of all students. By 2000, the National Research Council published its report that divided early childhood skill development into cognitive skills,

school readiness, and social/emotional development. While cognition has been assumed to be one of the predictors of adult independence, Currie (2001) reported that the variability and unstableness of intelligence have led to the increased focus on school readiness. A study conducted by the Carnegie Foundation for Advancement of Teaching, as reported by Currie, indicated that based on survey results from kindergarten teachers, only 65% of students entering kindergarten were observed to be ready to learn by teacher standard. Currie further explained that the teachers viewed readiness as based not solely on cognition. Factors such as physical wellbeing, communication skills, curiosity for learning, social skill development, and attention were rated as equal to overall intelligence as important factors for school readiness.

Present Day Early Childhood Programs

Present day changes regarding early childhood programs can be observed in the controversy surrounding the emphasis in early literacy and academic pre-readiness skills prior to the transition into kindergarten (Buysee & Wesley, 2006). Typically, children who are age five by a certain date within the fall semester are considered to be of kindergarten age depending on each state's individually established criteria. Hatfield (2007) argues that a child's developmental age should be taken into consideration despite the chronological age when determining readiness level for kindergarten. As the early learning standards for preschool children change, it is ever more increasingly important that the preschool programs implemented within the school and early childhood development settings learn to differentiate the standards related to literacy and additional academically based concepts in order to meet the needs of each student within the program (Buysee & Wesley).

By 2001, the percentage of 4-year-old children enrolled in a center or school-based program increased to 66% (Magnuson, Meyers, Ruhm, & Waldfogel, 2004). Of this percentage and by 2003, only 14% were enrolled in a general education school-based preschool program. Most programs at this time were half-day with few providing comprehensive full-day services that included health screenings, transportation, and meals. The criteria for entry into many public school pre-kindergarten programs were oftentimes dependent on the student's ethnic and socio-economic status. Research, however, reported by Magnuson et al. indicated that "being eligible does not guarantee access to these programs, with most states serving less than half of their target population" (p. 119). Evidence of the impact of early childhood development programs for school readiness has been limited (Magnuson et al.).

The curriculum required to teach early childhood students continues to be debated. Frede (1995) reviewed three dominant curricula that have been used in child development programs. The didactic or direct instruction curriculum is structured within a teacher-directed group lesson that addresses discrete skills in small incremental steps. The open classroom, or traditional approach, is framed within the idea that the teacher provides stimulating materials in which the students can freely explore their environment. Finally, the interactive or cognitive-developmental curriculum involves active learning between the child and his environment that is established by the teacher creating specific reasoning and problem-solving activities (Frede). The overall result of the study suggested that each of the curriculum procedures was more effective than no preschool program at all. Frede also reviewed several additional studies to evaluate the long-term effectiveness of early childhood programs. The conclusion focused on the interrelated

factors of class size, teacher/student ratio, service intensity, teaching practices, and curricula in order to provide quality preschool programs with long term effective results. Frede noted that the knowledge of how to provide beneficial programs for children from low-income families has been documented in the research, yet little influence has been used in the decisions by policymakers and federally funded initiatives.

The reauthorization of the Individuals with Disabilities Act (IDEA) in 1986 and again in 2004 has established key legislation that influenced the policies and procedures for early intervention services. Through Part C -- the Infant and Toddler program -- states were required to develop a broad system for the early identification and services for children from birth to three years old who met criteria for services as a student with a developmental delay. States were given the option to offer early intervention services to those students who fell within the at-risk range as well (Buysee & Wesley, 2006). The IDEA Part B -- Section 619 Preschool Program -- was established to require states to provide early intervention services through the school setting to students aged three to five years old with developmental delays or disabilities. This subsection also allowed the local education agencies the option to develop intervention services for students in kindergarten through twelfth grade who fell within the at-risk range. Yet, Snow (2006) found a widespread lack of consensus among early childhood education policy makers regarding the definition of readiness. According to Snow, the lack of uniformity in the definition “underscores the wide range of measures employed in the evaluation of state-funded preschool programs and the lack of agreement on which measure to use” (p. 8). The recent implementation of the Response to Intervention movement has prompted educators and researchers to evaluate the need for a comprehensive system of early

identification and intervention for preschool children before they enter into kindergarten (Buysse & Wesley). Many compensatory programs have failed to demonstrate the measurable growth needed to indicate improvements in closing the achievement gap. Educators have recently started to implement interventions that focus on a preventative approach. These preventative approach style interventions are designed to identify students who are lacking in specific skills at an earlier point in their education. Through individualized interventions, specific instruction needed to develop affective learning and readiness strategies is provided to the targeted student (D'Agostino & Murphy, 2004). The need for effective child development programs that use research validated curriculum and have demonstrated long-term effectiveness is vital to the overall growth and progress of society and to the needs of our educational population at this time.

Relevant Studies of Early Childhood Education

Several research-based studies have been conducted to measure the immediate and long-term effects of student participation in child development programs. Most have focused on the effects of specific program options on the developmental progress of children from low-income families. It is perceived that early childhood education generally improves the short-term cognitive performance of children, yet few studies have specifically examined the long-term effects of child development on sustained development (Barnett, 1998).

Barnett (1998) conducted a critical review of 38 studies to measure the long-term effects of early childhood programming on children living in poverty. Barnett targeted specific studies that measured the effects of early childhood education programs on school success of children living in poverty through at least the third grade. The main

questions explored in the review focused on the study of the long-term effects on cognitive development and academic achievement, the economic consequences of these effects, and the impact on public policy and reform. Center-based programs, in-home care programs, Head Start, and public school programs were included in the review as well as those with half-day and full-day services. Barnett concluded that the effects on cognition, as measured by intelligence tests, tended to subside after enrollment into elementary school; and the effects on academic achievement, as measured by standardized assessments, did not decrease over time. The author clarified that in many studies the long-term achievement rates appear to decrease but attributed this to the attrition of participants in the specific studies. He noted that in the true experimental and quasi-experimental studies, lasting effects were measured. Overall school success, as measured by rates of grade retention, special education, and high school graduation, was also favorable for students who participated in early childhood education programs. In conclusion, Barnett proposed that “every child living in poverty in the United States ought to be provided with at least one year of quality education prior to school entry in a part-day preschool education program or a full-day developmental child care program rich in cognitive interactions between teachers and children” (p. 207).

One well known study that measured the long-term economic effects and that conducted a benefits-cost analysis of early childhood education is the High Scope Perry Preschool study (Barnett, 1998). In this longitudinal study, 128 student participants from low income families were followed over a 40 year time period. The students, at age three, were enrolled in an early childhood program at the Perry Elementary School in Ypsilanti, Michigan. The program consisted of a five-day, 2.5 hour preschool class that

was supplemented with weekly home visits by the teacher. An active learning style curriculum was utilized to support cognitive and social-emotional development during the preschool year. Follow-up interviews with the participants at the ages of 15, 19, 27, and 40 years were conducted (Heckman, Moon, Pinto, Savelyev, & Yavitz, 2010). Analysis of the long-term results were divided into seven categories including custodial child care value, reduced cost of K-12 education, reduced cost of adult education, increased costs of college education, increased earnings and fringe benefits, decreased costs of crime, and decreased costs of welfare (Barnett). Results indicated that for every one dollar spent on high-quality preschool, the taxpayers in the American society gained seventeen dollars. While the monetary numbers alone are supportive of the benefits to society that early childhood programs can provide, additional developmental gains were also measured. The findings demonstrated that children who participated in the child development program were less likely to be retained one or more school years during their academic career, had higher high school graduation rates, made more money when they obtained jobs in the workplace, and had fewer arrests (Charleston County School District, 2008). This longitudinal study clearly demonstrates both the academic and societal gains that have been acquired by children who have participated in high-quality child development programs during their 4-year-old year.

In 2009, National Institute for Research on Early Education (Barnett et al., 2009) reviewed the number of programs and funding allocations for child development programs in the United States. At that time, South Carolina ranked 10th in terms of the number of 4-year-old child development programs available for parents within the state. While this number is positive, South Carolina ranked 37th out of 38 programs evaluated

in terms of funding allocations among federal, state, and local funding sources. This disparity in funding significantly alters the type of instruction, environmental arrangement, location of programs, and quality of teachers within each of the child development programs available (Barnett et al.). Due to this fact, it is imperative that districts offer 4-year-old programs that are equitable in funding, environment, and availability so that the district and each student can benefit from the long-term gains measured in previous nation-wide research studies.

Finally, a national data base was created by the National Center for Education Statistics through the U.S. Department of Education to further examine the development of students within the United States. The Early Childhood Longitudinal Study (ECLS) program is comprised of three longitudinal cohorts of students and was devised to assess overall child development, school readiness, and early school experiences (Najarim, Snow, Lennon, & Kinsey, 2010). ECLS-Birth (ECLS-B) includes children born in 2001 and who were followed through their kindergarten entry. ECLS-Kindergarten (ECLS-K) includes students who were in kindergarten during the 1998-1999 school year and who were followed until 2011 when most students should have been completing their twelfth grade school year. ECLS-Kindergarten: 2011 (ECLS-K: 2011) includes children who were in kindergarten during the 2010-2011 school year and will follow them through their fifth grade school year. This national database provides information relevant to transitions to non-parental care, early education programs, school based programs, experience and growth through the eighth grade, and relationships among family, school, community, and individual growth variables. While the outcomes of each of the cohorts are pertinent to overall early childhood development and national progress monitoring,

this literature review will primarily focus on the data results from the ECLS-K sample due to its close alignment with this current study reported in Chapter 4.

The ECLS-K study included a nationally representative sample of approximately 22,000 students who were enrolled in kindergarten during the 1998-1999 school year in approximately 1,000 classes throughout the United States. These classes included both public and private kindergartens which offered both full-day and part-day programs. Children with limited English proficiency and students with special education needs were also included in the database. The sample included students from different racial/ethnic groups who were subdivided into the categories of black, white, Hispanic, or Asian. Additional data regarding the student's socio-economic status were collected. Data within the developmental domains of cognition, social-emotional development, and physical development were collected from a variety of sources including the study participants, their families, their teachers, and their school-based leaders. Supplementary data regarding the participants' environmental locations including their home, school, and classroom settings, educational practices within the home, curriculum used within their classrooms, and teacher qualification data were also obtained (Horton, 2006).

The two main purposes of the study were to provide descriptive information on the sample of participating students and to establish a data set that will provide researchers with varying raw data in a range of developmental variables that can be further analyzed to determine its effect on school progress. The ECLS-K, however, did not include specific data related to the participating students' preschool/early childhood years. Parents completed questionnaires regarding their child's prior early childhood programming. Further research has used that data, along with the data obtained from the

students' kindergarten and subsequent school grades to estimate the effects of early childhood programming on school performance. The primary research questions asked within the study include:

- (1) What is the developmental status of children at kindergarten entry? What are school expectations regarding entering children's skills, behaviors, and attributes? How well do children with different backgrounds and life experiences fare in the kindergarten environment?
- (2) How do child, family, and school factors interact to affect children's transitions from kindergarten to first grade, from elementary to middle school, and from middle to high school?
- (3) To what extent do schools and classrooms successfully address the needs of all children, including those with special needs?
- (4) When do children begin to experience problems with their school work? What are the circumstances surrounding those difficulties? How long do these problems last? How do children's families, schools, and teachers respond to them?
- (5) What roles do parents and families play in preparing for and supporting their children's education? How do families, schools, and communities interact to support children's education (Horton, 2006)?

Data from this cohort were collected in the beginning and at the end of the students' kindergarten school year. In the years following kindergarten, data were collected from a subsample of 30% of the cohort in the fall and from the full sample within the study in the spring. Data were collected through direct child assessments,

parent/guardian reports, teacher reports, and other school reports from school administrators, principals, and headmasters of private schools. Additional data were collected at periodic points within the child's school progression including third grade (2002), fifth grade (2004), eighth grade (2007), tenth grade (2009), and twelfth grade (2011) (Horton, 2006).

Various studies have been conducted from the data set that was obtained in the ECLS-K project. For the purposes of this proposed study, studies summarized by Horton will be further explored due to their specific analysis of the children's preschool experience and the impact on kindergarten and later school progress. Horton (2006) summarized these studies and reported that the data collected primarily consisted of direct parental reports regarding each child's previous preschool experience. The student samples were divided into four groups based on whether they (1) attended Head Start, (2) participated in a non-Head Start center-based program, (3) enrolled in other non-parental care, or (4) were in parental care for the year prior to the start of kindergarten.

Results indicated that students who participated in any of the early childcare programs experienced a 1.2 higher reading score and a 0.95 higher math score, which corresponds to effect sizes of 0.12 and 0.10 respectively. However, for children who attended an early childcare program prior to kindergarten, 70-80% of the associated cognitive gains faded out by the spring of first grade, which is equivalent to a statistically significant, yet small effect size of 0.03 for reading and math. It was noted that particular pre-reading gains were larger and sustainable for children from lower socio-economic status with math effects remaining statistically significant for families receiving temporary assistance for needy families (TANF) through the spring of first grade. Also,

children from Hispanic families who were center-based experienced a 0.23 SD increase in reading performance, which is three times the effect size for white children. These results indicate that the achievement gains that are experienced in reading and math achievement in kindergarten, from students who participated in early childcare programs, are evident during their kindergarten and first grade year yet do not appear to continue past that time as they progress through their school careers (Horton, 2006).

Additional data in the area of behavioral performance indicated that participation in early childcare programming had a small, but statistically significant negative effect on the student's overall externalizing behaviors and negative behaviors associated with self-control. These negative effects increased in accordance with the numbers of hours per week the child was in childcare and varied by the early childcare subgroup programming type. Middle-class children and children from higher social-economic status in childcare for 30 or more hours demonstrated the largest negative outcomes while students from lower socio-economic status showed fewer negative results. Hispanic students demonstrated no statistically significant effects when the data were analyzed.

Further data that were collected measured the retention rate of students who participated in early childcare programs. Results indicated that both participation in Head Start and other center-based program options is associated with a 2% reduction in the rate of kindergarten retention. Horton (2006) stated that 7.5% of the overall study sample was retained; therefore, it is important to note that these results suggest that participation in early childcare programs resulted in a 27% rate of reduction in possible retention during the student's kindergarten year.

Relevant Studies within South Carolina

The South Carolina Department of Education (SC DOE) has conducted research in the area of achievement for students within the state who have participated in the child development programs offered in school districts. The Child Development Educational Pilot Program (CDEPP) is a pilot full day Child Development program for at-risk 4-year-old students residing in 37 specified counties within South Carolina who were plaintiff districts in a school funding lawsuit (*Abbeville County School District, et al. vs. The State of South Carolina, et al.*, Opinion No. 24939) (South Carolina Education Oversight Committee, 2008).

Results of the Developmental Indicators for the Assessment of Learning, Third Edition (DIAL-3) (Mardell-Czudnowski & Goldenberg, 1998) assessments conducted during the 2006-2007 school year indicated that the children funded by CDEPP entered school with scores that were reliably lower than the scores of other preschool students who were not enrolled in the participating pilot program. Additional data also indicated that there was a measurable achievement gap between the students' developmental readiness scores at both the statewide level and within the districts implementing CDEPP.

The SC Education Oversight Committee (2008) included ten specific recommendations in the January 2008 CDEPP Summary Report. Two of the recommendations stated were specific to the need for additional data collection and further support the need for this current research study. These included 1) the need for additional eligibility requirements for students of not only those from low income families but also those who score below a specific cut score percentile on the DIAL-3 or a comparable screening assessment and 2) the need for additional data collection to

advance the accountability of both the administration and financial responsibilities of the program (South Carolina Education Oversight Committee, 2008). The literacy achievement gap that is measured between low-income students and others who enter kindergarten must be closed in the early years of school.

In another recent longitudinal study conducted by the South Carolina Department of Education (Tenenbaum, 2004), data were collected and reviewed to measure the long term achievement gains on the Palmetto Achievement Challenge Test (PACT) assessment for students in the sixth and seventh grades. Data from a carefully matched group of students who did not participate in the Child Development program compared to the data of a group of similar students who did participate in the CD program were analyzed. Researchers found that the students who did participate in the CD programs within South Carolina performed better on the Palmetto Achievement Challenge Test (PACT) English Language Art (ELA) and PACT Math when compared to those who did not participate in the CD programs available. The findings also indicated that, when disaggregated by gender, race, and socio-economic status, those children who had participated in the CD program demonstrated sustained positive performances in the categories of males, non-Caucasians, and students from low-income families when compared to those of non-CD participants (Tenenbaum).

Following this study, researchers within the Charleston County School District (CCSD) also collected similar data in 2008 to measure the achievement gains of students in the third grade within CCSD compared to a control group of students within CCSD who did not participate in the CD programs (Charleston County School District, 2008). Data indicated similar achievement gains in PACT ELA and PACT Math as those

measured in the SC DOE study (Tenenbaum, 2004). Also, in CCSD it was determined that the CD students actually performed higher than the comparative group, and the CD students met the district wide third grade average in both reading and math.

Disaggregated data results were analyzed, and in CCSD there was not a measurable difference or ‘achievement gap’ between racial groups. The ‘achievement gap,’ however, was measured to be significant in the comparative group during data analysis (Charleston County School District, 2008).

In Charleston County, data are collected yearly to measure the short-term impact of participation in the Child Development programs within the county. In 2008, Charleston County School District had 42 CD programs in operation within the public school system. While these programs are offered for all 4-year-old students within the district, there are a limited number of positions or spots available for student selection into the program. The selection process includes a parent questionnaire that includes data related to gender, race, English proficiency level, parent income level, and the mother’s educational level as well as the administration of a standardized developmental screening measure to the student. Once all students referred are assessed, the scores are rank ordered, and those most in need are accepted.

Approximately 1,800 four-year-old students applied for the CCSD CD program during the 2007-2008 school year. Of these 1,400 were enrolled in either full-day or half-day programs. Pre-assessment data indicated that the average performance on the DIAL-3 assessment of those students accepted into the CD programs fell at the 22nd percentile (Charleston County School District, 2008). Post-assessment data were collected at the end of the year to measure the overall achievement gains due to the early

intervention and instructional practices provided in the CD programs. Post-assessment data indicated that the average performance on the DIAL-3 at the end of the school year for those accepted into the program fell at the 86th percentile. The increase in motor development, language development, and conceptual knowledge due to participation in the CD program within CCSD is clearly measured and similar gains in percentile rank have been measured prior to 2008 and should continue to be measured in the future as well based on a review of the data (Charleston County School District).

During the 2010-2011 school year, Charleston County School District increased the number of Child Development programs offered for families within the county. The expansion of the CD programs within CCSD progressed from eight half-day program schools with an enrollment of 216 half-day students and one early learning center during the 2005-2006 school year to the present day 83 full day classes, in 44 schools, with the enrollment of 1,880 students, seven half-day programs and five early learning centers during the 2010-2011 school year. The Director of Early Childhood Education in CCSD presented these data to the school board on August 23, 2010. Additionally, the director indicated that the district's current theory of action proposes that the increase in the number of programs, coupled with effectively implemented curriculum that is matched to student need in a developmentally appropriate manner, will improve school readiness. It is believed that these changes may reduce the need for remedial programs in CCSD.

Sound research, evaluating the short term as well as long term effectiveness of the CD programs within CCSD, is required in order to measure the longitudinal impact of participation in CD during the four-year-old preschool experience. Through this current study, specific data related to long-term reading achievement gains will be assessed by

student performance on a nationally recognized measure to determine the impact of a student's participation in the Child Development program within CCSD in the area of reading achievement.

Summary

This study examined the impact of early childhood education on reading achievement of children, kindergarten through eighth grade, who participated in the Child Development (CD) program within Charleston County School District (CCSD) during the 2002-2003 school year. The participating students' achievement was determined by analyzing their performance on the Measures of Academic Performance (MAP) (Northwest Evaluation Association, 1997) assessment at pivotal points within a child's educational career. The test results were compared to those of a matched group of students who did not participate in the CCSD Child Development program. An examination and comparative study of the implementation of the four-year old Child Development program in Charleston County, South Carolina, provided a more comprehensive evaluation of students' sustained achievement through the primary, elementary, and secondary grades. The results of this study closely align with the *Charleston Achieving Excellence Plan* by evaluating the reading achievement of students and assisting in the measurement of 1) elevating the achievement of all students, 2) closing the achievement gap, and 3) increasing the graduation rate.

Chapter Two provided a review of the history of reading instruction within the United States, current instructional practices in the area of reading, the history and creation of early childhood education, and previous national, state, and local research in the area of study in order to understand the impact of early childhood education on later

reading achievement. The following chapter outlines the methodological components of the this current research study. A review of the chosen instrumentation measures, data collection procedures, and statistical analysis are discussed.

CHAPTER THREE

METHODOLOGY

This study proposed to examine the impact of early childhood education on reading achievement of children, kindergarten through eighth grade, who participated in the Child Development (CD) program within Charleston County School District (CCSD) during the 2002-2003 school year. The participating students' achievement was determined by analyzing their performance on the Measures of Academic Performance (MAP) (Northwest Evaluation Association, 1997) assessment at pivotal points within a child's educational career. The test results were compared to those of a matched group of students who did not participate in the CCSD Child Development program. An examination and comparative study of the implementation of the four-year old Child Development program in Charleston County, South Carolina, provided a more comprehensive evaluation of students' sustained achievement through the primary, elementary, and secondary grades. This chapter describes the research design chosen, the participants in the study, data collection procedures, instrumentation used to measure reading achievement, and the data analysis procedures.

Research Design

The research design used in this study is a quantitative, longitudinal study including a cohort of school-aged children. A descriptive quantitative research methodology was utilized due to the literal nature of the data and accounted for the need of a systematic review of the results in a factual and accurate manner (Isaac &

Michael, 1995). The quantitative approach was chosen due to the nature of the data collection process. For this study, accurate descriptive and inferential analyses were required to assess the longitudinal performance of students who participated in the Child Development program compared with a matched sample of students who did not participate in the Child Development program within CCSD to evaluate the long-term reading achievement performance of the two groups of students.

Students in this study were representative of a population sample from Charleston, South Carolina. The children were initially assessed during their four-year-old Child Development year through the administration of the Developmental Indicators for the Assessment of Early Learning - Third Edition (DIAL-3) (Mardell-Czudnowski & Goldenberg, 1998) which provided pre- and post-intervention performance results. Additional assessments were conducted when the cohort of students has progressed into the second, fifth, and eighth grades using the Measures of Academic Performance (MAP) (Northwest Evaluation Association, 1997). The data were analyzed longitudinally through the analysis of reading performance in second grade, fifth grade, and eighth grade. Through the disaggregation of the data, the socio-economic status, race, and gender achievement gaps were also reviewed. The summary of data collected is listed below in Table 3.1

Table 3.1
Summary of the Research Design

Year	Group 1	Group 2
2002-2003	Child Development- DIAL-3 pre and post assessment results	Not applicable
2005-2006	Second Grade- MAP Reading spring data	Second Grade- MAP Reading spring data
2008-2009	Fifth Grade- MAP Reading spring data	Fifth Grade- MAP Reading spring data
2011-2012	Eighth Grade- MAP Reading spring data	Eighth Grade- MAP Reading spring data

Participant Sample

This study is a follow-up measure to a previous study that was conducted by the Chief Academic Office, Department of Assessment and Accountability within Charleston County School District (2008). The Department of Assessment and Accountability presented data from the 2002-2003 school year of students who participated in the Child Development program and then followed the students in grade level to kindergarten (2003-2004 school year), first grade (2004-2005 school year), second grade (2005-2006 school year), and finally third grade (2006-2007 school year). The data collection from the second grade year, as well as these same students' fifth grade year (2008-2009) and eighth grade year (2011-2012) were utilized by this researcher to analyze the specific research questions that are relevant to the study. The study data were analyzed longitudinally through the analysis of reading performance by individual grade cohorts (CD, second, fifth, and eighth grade). Through the disaggregation of the data, the social-economic status, race, and gender of students were also reviewed (Charleston County School District, 2008).

In the original study, during the 2002-2003 school year, 1,260 four-year-old students were served through the CD program within CCSD. Funding for the classes was obtained through EIA - Child Development funds, Charleston County First Steps Partnership Board, local funds, and Title 1 funding. The South Carolina State Department of Education subsidized a total of 20 students per class, in a half-day setting, with a certified early childhood education teacher and a qualified teacher assistant. Information indicated that of the 41 schools with CD programs, multiple funding sources were combined to form a mix of half-day and full-day programs for that particular school year.

Parents of children who were four years of age on or before September 1, 2002, voluntarily pre-registered their child for the CD program if they were interested in enrollment for the 2002-2003 school year. Pre-registration was encouraged at each district elementary school where the students were zoned to attend based on their home address. Parents were required to present a legal birth certificate, proof of residence, certificate of immunization, and social security card (if applicable) at the time of pre-registration. Pre-registration did not guarantee enrollment in the CD program for the 2002-2003 school year. Students selected for the CD program were required to demonstrate developmental needs as well as identified risk factors before non-eligible children were considered. Each child who was pre-registered was then screened through the Developmental Indicators for the Assessment of Learning- Third Edition (DIAL-3) assessment (Mardell-Czudnowski & Goldenberg, 1998) to determine his or her developmental levels of progress in the areas of motor, concepts, and language skills when compared to age related national normative data. In addition, other potential family

risk factors including socio-economic status, marital status, parental education level, and criminal history were also obtained through the parent completion of a Family Survey Information Form. All sources of data were reviewed to determine eligibility for enrollment based on specific CCSD district guidelines (Charleston County School District, 2008). Notification of CD program acceptance was then mailed to the parents prior to the start of the 2002-2003 school year.

Participant Sample Matching Process

The Department of Assessment and Accountability (Charleston County School District, 2008) conducted a two-step matching process to identify the CD and non-CD participant groups for the preliminary study. During the 2007-2008 school year, a total of 711 students who initially participated in the CD program during the 2002-2003 school year were actively enrolled in CCSD schools and also participated in the spring Palmetto Achievement Challenge Test (PACT) of their third grade school year. Initially, matches were created by pairing each student in the CD cohort at their third grade year with a third grade student of the same race, gender, lunch program status, English Language Learner status, and from the same school for his or her kindergarten year of instruction. It should be noted that in order to increase the sample size, some of the matching criteria were relaxed to allow for a more reflective comparison group. In order to acquire an appropriate sample size, matches continued across ethnic categories; the researchers combined the 'reduced-price lunch' and the 'free lunch' categories, and the school variable was changed to identifying Title 1 versus non-Title 1 status instead of individual school specific matches. Additional requirements for the CD cohort and non-CD cohort including participation in the third grade Palmetto Achievement Challenge Test (PACT)

English Language Arts and Math as well as sustained enrollment in CCSD schools in grades kindergarten through third grade without retention were also included in the matching process (Charleston County School District, 2008).

A total sample size of 219 students resulted from the two-step matching procedures. Table 3.2 summarizes the disaggregated data that were derived from the review of the 711 actively enrolled CD participant students who were then enrolled in the third grade. Over-sampling of data within the CD sample in the areas of African-American students, non-ELL students, and students attending Title 1 schools was necessary due to the difficulty in matching the less frequent demographic characteristics that were found in the complete CD group. Therefore, small differences exist between the total CD group and the sample CD cohort group to account for these needs.

Table 3.2
Summary of the Demographics by Group from the Original Study
(CCSD Department of Assessment and Accountability, 2008)

	All 2002-2003 CD students* (N=711)	CD Sample (N=219)	Non-CD Matched Comparison (N=219)
<u><i>Ethnicity</i></u>			
African-American	71%	83%	84%
Caucasian	21%	13%	14%
Other	8%	4%	3%
<u><i>Gender</i></u>			
Female	50%	53%	53%
Male	50%	47%	47%
<u><i>Free/Reduced Price Lunch</i></u>			
Full Pay	24%	15%	15%
Free/Reduced	75%	85%	85%
<u><i>English Language Learner</i></u>			
No	94%	97%	97%
Yes	6%	3%	3%
<u><i>Title 1 Status of Kindergarten Attended in 2003-2004</i></u>			
2003-04 Title 1 School	66.2%	79.9%	80.4%
2003-04 Non-Title 1 School	33.8%	20.1%	19.6%

* This includes only students with both PACT ELA and Math scores in the third grade.
Note: Percentages may not add to 100% due to rounding

In review of the 1,260 students who attended the CD program during the 2002-2003 school year, the pre-assessment results of the DIAL-3 (Mardell-Czudnowski & Goldenberg, 1998) indicated that the average normal curve equivalent performance for the total CD population was 39 (Charleston County School District, 2008). The average performance of the students selected for the CD cohort was a normal curve equivalent score of 38, which is representative of the total CD group's initial pre-assessment performance on the DIAL-3 (Mardell-Czudnowski & Goldenberg, 1998). Table 3.2 summarizes the comparisons between the CD cohort and matched non-CD cohort in terms of ethnicity, gender, free/reduced price lunch, English Language Learner, and Title 1 status of the school attended during kindergarten of the 2003-2004 school year. Slight variations were measured between the two groups who are comparable in terms of each of the demographics for this study. In the instances of variance, no more than one percentage point difference is measured.

Instrumentation

Archived data collected by the participating school district on multiple occasions were used in this study. As a follow-up to the preceding research study, two previously utilized data files as well as three additional data files were used for this study: 1) 2002-2003 specific Child Development DIAL-3 data, 2) matched non-Child Development participant sample from the original study, 3) targeted second grade MAP Reading data for CD and non-CD matched students, 4) targeted fifth grade MAP Reading data for CD and non-CD matched students, and 5) targeted eighth grade MAP Reading data for CD and non-CD matched students. All files were merged for analysis procedures.

Developmental Indicators for the Assessment and Learning-Third Edition. The first data source was the 2002-2003 Child Development administration of the DIAL-3. The DIAL-3 was published by Pearson Assessments and is an individually administered developmental screening assessment for children aged three years to six years, eleven months old (Mardell-Czudnowski & Goldenberg, 1998). Within the assessment, developmental performance in the areas of motor, concepts, language, self-help and social development can be obtained through either direct assessment with the child (for motor, concepts, and language) or through parent interview (self-help and socialization). The motor area includes direct evaluation in the areas of gross motor development (e.g. run, jump, and skip) and fine motor control (e.g. block building, cutting, drawing, and finger-touch).

Language development is assessed through both expressive language (e.g., answering personal questions, articulation, and naming of objects) and receptive language (e.g., pointing to verbally named objects) as well as phonemic awareness items. The concepts area includes pointing to body parts, naming colors, rote counting, positional concepts, and shape-sorting activities. Through parent interview, the self-help domain evaluates the child's independent abilities in the areas of dressing, eating, and personal responsibility skills. Finally, social development including social skills, compliance, self-control, and empathy are also assessed through parent interview.

The DIAL-3 is a standardized assessment that provides results through composite standard scores, percentile ranks, standard deviation, and percentile cutoff points by chronological age at two-month intervals. In CCSD, specifically trained Child Development teachers administered the DIAL-3 to those students who were parentally-

referred for the CD program. The composite subtest scores were used as a part of the multi-factored selection criteria for placement into the CD program with CCSD (Charleston County School District, 2008). For this study, the concepts domain was the main composite score of interest and assessment analysis.

Measures of Academic Performance. The Measures of Academic Performance (MAP) is a norm-referenced computer-based diagnostic and adaptive assessment for students in grades kindergarten through second (MAP-Primary) and grades second through eleventh (MAP) that was created by the Northwest Evaluation Association (NWEA, 1997). Assessment data from the measurement include Prerequisite (diagnostic) Tests, Skills Checklist (diagnostic) tests, and Survey with Goals (adaptive) tests in reading and mathematics (NWEA, 2007).

The Prerequisite Reading Diagnostic Test measures a student's letter recognition, sounds, and concepts of print. Results can be used to assist with the placement of students into supplemental instructional programs and interventions. The Skills Reading Diagnostic Checklist consists of two tests of phonological awareness skills and five tests of phonics. The teacher selects the specific test based on the content focus of instruction at that time and the particular developmental sequence of learning. Scores are reported by number correct and percentage correct and also can be used to measure a student's progress relative to the skills assessed. The Adaptive Reading Survey with Goals Test includes two reading tests that cover (1) phonological awareness, phonics, and concepts of print and (2) vocabulary/word structure, comprehension, and writing. The test questions adjust based on the student's individual performance level while completing the evaluation (NWEA, 2007).

Scores from the Survey with Goals test are reported with an overall Rasch Unit (RIT) score and a goal score range that are used to assist with a student’s instructional level. The RIT score is derived from a student’s performance on the NWEA created RIT scale, which was created from the Item Response Theory (IRT) by Georg Rasch (NWEA, 2007). The scores are independent of a specific grade level which allows for comparable data and growth across school years (Felix, 2006) and are based on the difficulty level of the posed question (NWEA, 2007). Grade specific RIT score recommendations are available, and for the purposes of this study, the end of the year RIT score for second, fifth, and eighth grades was used to determine if a student had successfully met the established standard for benchmark attainment.

Data Collection Procedures

The procedures for data collection primarily consisted of data editing and recoding of variables, as well as the merging of data files prior to conducting analyses due to the longitudinal descriptive research methodology employed for this study. Table 3.3 represents the overall design of the study.

Table 3.3
Summary of the Data Reviewed

Year	Group 1	Group 2
2002-2003	Child Development-DIAL-3 pre and post assessment results	Not applicable
2005-2006	Second Grade-MAP Reading spring data	Second Grade-MAP Reading spring data
2008-2009	Fifth Grade-MAP Reading spring data	Fifth Grade-MAP Reading spring data
2011-2012	Eighth Grade-MAP Reading spring data	Eighth Grade-MAP Reading spring data

To ensure confidentiality, individual student names were removed from the database by the district prior to the researcher's receiving of the data sources. The district assigned the students unique student identification numbers that were consistent across the multiple data sources to assist with the merger. A formal request for the previous longitudinal data that were used in the prior study as well as the request for the additional data sources was sent to the CCSD Chief Academic Office, Department of Assessment and Accountability through the district formal request for data procedural guidelines and was approved prior to conducting the research for this study. The data base of information was then merged into the EXCEL and MiniTab software programs that were used for data analysis.

Data Analysis Procedures

To analyze the specific research questions posed, descriptive statistics were calculated for each sample group including specific means and standard deviations for each grade level and assessment measure implemented. The data obtained were merged into an EXCEL database along with the use of the MiniTab program. The researcher used a general linear model analysis of variance (ANOVA) procedure to analyze the data obtained. An ANOVA is a hypothesis-testing procedure that evaluates the mean differences between two or more variables (Issac & Michael, 1995). The Welch F procedure was used because the assumption of homogeneity is that the variance is violated. This was determined by the Levene's test of homogeneity, which evaluates if the variances between the different groups are equal. For this study, the variances were expected to be significantly different at the 0.05 level. The Tukey *post hoc* test was

completed initially to determine which mean differences were significant and which mean differences were not significant for the variances that are not equal.

Limitations of the Study

Usage of archival data for only those students enrolled in the CD program limited the number of possible participants in the study. Also the students, as well as the comparative sample, were limited to the geographical area of Charleston, South Carolina. The researcher used a sample of convenience due to employment with the selected school district. The measures selected for this study were limited to those used within Charleston County during the specified time frame ranging from 2002-2011. The assessments used were also restricted to those selected by Charleston County School District and the South Carolina Department of Education during the specific time frame for the study. Random assignment of students into each group could not be completed due to the nature of the specific enrollment procedures for students who were eligible for the CCSD Child Development program. This also may have impacted the nature of the results. Missing data naturally occurred due to the longitudinal nature of the study and were handled initially at the matching of the control group in the original study by relaxing the criteria by combining ethnic categories and free and reduced-price lunch categories and through the collapsing of school variables into Title 1 versus non-Title 1 school status.

Summary

This chapter described the research design chosen, the participants in the study, data collection procedures, instrumentation used to measure reading achievement, and the data analysis procedures as well as limitations to the study. The following chapter will

discuss the results that were obtained through the data analysis including the review of the descriptive and statistical results.

CHAPTER FOUR

RESULTS

This study examined the impact of early childhood education on reading achievement of children, kindergarten through eighth grade, who participated in the Child Development (CD) program within Charleston County School District (CCSD) during the 2002-2003 school year. The participating students' achievement was determined by analyzing their performance on the Measures of Academic Performance (MAP) (Northwest Evaluation Association, 1997) assessment at pivotal points within a child's educational career. The test results were compared to those of a matched group of students who did not participate in the CCSD Child Development program. An examination and comparative study of the implementation of the four-year-old Child Development program in Charleston County, South Carolina, provided a more comprehensive evaluation of students' sustained achievement through the primary, elementary, and secondary grades. This chapter describes the demographics of the participants, hypothesis data analysis in regard to the specific research questions posed, and data summary findings. Data were collected following the submission of the Research Proposal to the Charleston County School District's Office of Assessment and Evaluation which was approved on October 10, 2011. Both descriptive and inferential statistical methods were used. The inferential method used was a general linear model analysis of variance with Tukey Method *post hoc* test. Statistical significance for each test utilized was set at 0.05 alpha levels.

Demographic Information and Participant Sample

Current longitudinal participant samples were determined, largely, based on natural attrition of initial participants between grade two and grade eight from the previous Charleston County School District (CCSD) study that was originally conducted in January 2008. The original 219 matched students were filtered until each sample set included students in second grade, fifth grade, and eighth grade with specific, individualized Measures of Academic Performance (MAP) reading scores for each grade level. Following that filter, random samples were drawn from both treatment and control groups in a fashion that allowed for a balance in the total number of students in each group. The students in the Child Development (CD) sample were residents of Charleston County and entered CD programming during the 2002-2003 school year. The students in the non-CD sample were residents of Charleston County and entered into kindergarten during the 2003-2004 school year.

The student sample cohort for the study included 110 former Child Development (CD) and 110 non-Child Development programming students. The CD sample was comprised of 49 males (44.5%) and 61 females (55.4%). The ethnic distribution for the CD sample was 80.0% African American ($n = 88$), 18.2% Caucasian ($n = 20$), and 1.8% Hispanic ($n = 2$). Eighty-one percent of the students in the CD sample received free and reduced price lunch ($n = 89$) with the remaining 19% being full-pay ($n = 21$). The non-CD group was comprised of 56 females (50.9%) and 54 males (49.1%). The ethnic distribution for the non-CD sample cohort was 75.5% African American ($n = 83$), 20.9%

Caucasian ($n = 23$), and 3.6% Hispanic ($n = 4$). The lunch status of the non-CD sample was consistent with that of the CD sample with 77.3% receiving free and reduced-price meals ($n = 85$) and the remaining 22.7% being full-pay.

Second Grade Analysis

Research Question #1: How do children who participated in the Charleston County School District Child Development (CD) program during the 2002-2003 school year compare to a matched sample of non-Child Development students at the end of their second grade year as measured by the Measures of Academic Performance (MAP) Reading assessment?

- a. Do the results vary when data are disaggregated by socio-economic status for the students who participated in the Child Development program?
- b. Do the results vary when data are disaggregated by race for the students who participated in the Child Development program?
- c. Do the results vary when data are disaggregated by gender for the students who participated in the Child Development program?

Table 4.1 shows the group statistics for the mean and standard deviations of scores on the second-grade MAP reading of the two groups. Students who received Child Development programming demonstrated a mean reading score of 184.42. The scores of the students who did not receive Child Development programming are similar to those who did receive CD programming, with a mean reading score of 185.19 at grade two.

Table 4.1
Group Statistics for Grade Two Measures of Academic Progress Scale Scores

Program Type	Number	Mean	Standard Deviation
Child Development	110	184.42	13.93
Non-CD	110	185.19	16.06

In Figure 4.1, the distribution of scores between the Child Development (CD) and non-CD group is presented using Box plots. Box plots present the data in the most compact way and can be used to visualize multiple distributions simultaneously. The box represents the inter-quartile range which contains 50 percent of the values. The whiskers are lines that extend from the box to the highest and lowest values, excluding outliers. Outliers are represented by asterisks. A line across the box indicates the median. The line across and connecting the two box plots illustrates the mean scores of the two groups.

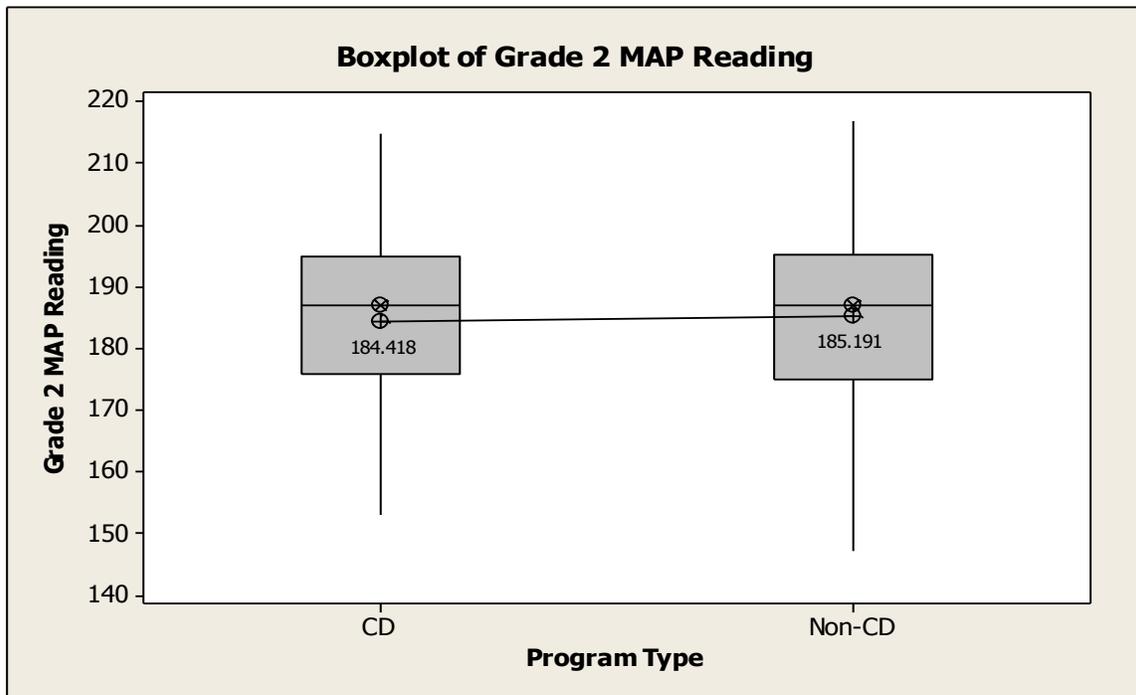


Figure 4.1
Box plot of MAP grade two reading scores by program type

The initial data analysis was conducted to assess if there is a significant difference in reading achievement at grade two between students who received early childhood programming services (CD students) and those who did not as measured by Measures of Academic Progress (MAP) reading at a 0.05 alpha level. The null hypothesis states there will be no significant difference in reading achievement at grade two between students who received early childhood intervention services and those who did not receive early childhood intervention services as measured by grade two MAP reading. The alternative hypothesis states there will be a significant difference between the group means. The independent variable is the type of program, if any, the child attended. The dependent variable is the reading score based on the grade two Measures of Academic Progress (MAP). Additional research questions were posed to assess if there is a significant difference in reading achievement at the second grade level as measured by MAP reading between factors related to the student's gender, ethnicity, and lunch status. The null hypothesis states there will be no difference in reading achievement between students related to the factors of gender, ethnicity, or lunch status. The alternative hypothesis states there will be a significant difference between these factors group means.

Although no outliers were apparent in either group's box plot of second grade MAP reading scores, a normal probability plot utilizing Anderson-Darling's test for normality was initially completed for both distributions. The assumption that the distributions of scores were normally distributed was not met for the CD and non-CD groups. The results indicated that $p (.005) < \alpha (0.05)$ and $p (0.013) < \alpha (0.05)$, respectively. Curvature was visually apparent in both data sets' normal probability plots. This is not surprising given the small sample size of each group and the fact that each

group was initially drawn from a specific sample of the population that was based on the criteria for entry into the Child Development program (achievement results, parents socio-economic status, language status, etc).

Given the structure of the CD and non-CD groups' initial sample, a fully balanced hierarchical design could not be achieved. As a result, a general linear model analysis of variance and Levene's test for homogeneity was completed. The results are given in Table 4.2. The assumption that the homogeneity of variance was met because $p(0.315) > \alpha(0.05)$. Therefore, the general linear model analysis of variance was utilized. The results of the general linear model analysis of variance revealed that Gender, $F(1, 214) = 7.44$ $p < 0.05$ was significantly related to MAP second grade reading scores. Thus, the null hypothesis for gender was rejected. Program type, ethnicity, and lunch status were insignificant. However, the coefficient of determination (R^2) indicated that only 16.24% of the variability in second grade MAP reading scores was accounted for by the model factors.

Table 4.2
General Linear Model ANOVA of Grade Two Test Score

Factor	Type	Levels	Values			
Program Type	Fixed	2	CD, non-CD			
Gender	Fixed	2	F, M			
Lunch Status	Fixed	2	F&R, Full Pay			
Ethnicity	Fixed	3	African American, Caucasian, Hispanic			
Source	<i>df</i>	Seq SS	Adj SS	Adj MS	F	P
Program Type	1	32.8	23.9	23.9	0.12	0.725
Gender	1	2212.9	1435.0	1435.0	7.44	0.007
Lunch Status	1	4634.7	70.1	70.1	0.36	0.547
Ethnicity	2	1125.0	1125.0	562.5	2.92	0.056
Error	214	41293.2	41293.2	193.0		
Total	219	49298.6				
S = 13.8910		R-Sq = 16.24%		R-Sq (adj) = 14.28%		

Post hoc comparisons, using Tukey method, were conducted for each group to determine which pairs of the four different group means for Gender differed on second-grade MAP reading scores. These results are given in Table 4.3 and indicate that males ($M = 179.78$, $SD = 14.37$) had significantly lower average scores on grade two MAP reading than their female counterparts ($M = 188.15$, $SD = 12.47$) within the CD group. Differences between group means for Gender within the non-CD group were negligible.

Table 4.3
Tukey Simultaneous Tests for Grade Two MAP Reading

(I) Group	(J) group	Mean Difference	Std. error	Sig.	95% confidence interval	
					Lower	Upper
Child Development	Males	-5.951*	2.192	0.0078	-10.30	-1.605
Non-CD	Males	-2.010	2.929	0.4941	-7.818	3.798

* The mean difference is significant at the 0.05 level

Fifth Grade Analysis

Research Question #2: How do these same children who participated in the Charleston County School District Child Development (CD) program during the 2002-2003 school year compare to the same matched sample of non-Child Development students at the end of their fifth year as measured by the Measures of Academic Performance (MAP)

Reading assessment?

- a. Do the results vary when data are disaggregated by socio-economic status for the students who participated in the Child Development program?
- b. Do the results vary when data are disaggregated by race for the students who participated in the Child Development program?

- c. Do the results vary when data are disaggregated by gender for the students who participated in the Child Development program?

Table 4.4 includes the group statistics for the mean and standard deviations of scores on the fifth-grade MAP reading for the two groups. Students who received Child Development programming demonstrated a mean reading score of 209.53. Again, the scores of the students who did not receive Child Development programming were similar to those who did receive programming as demonstrated by a mean reading score of 206.79 at grade five.

Table 4.4
Group Statistics for Grade Five Measures of Academic Progress Scale Scores

Program Type	Number	Mean	Standard Deviation
Child Development	110	209.53	12.31
Non-CD	110	206.79	16.90

In Figure 4.2, the distribution of fifth grade reading scores between the Child Development (CD) and non-CD group is presented using box plots. Both box plots revealed several negative outliers for both groups. Because of this, normal probability plots utilizing Anderson-Darling’s test for normality was again completed for both distributions. The assumption that the distributions of scores were normally distributed was not met because $p(0.012) < \alpha(0.05)$ for the CD group and $p(0.005) < \alpha(0.05)$ for the Non-CD group. Again, the whiskers are lines that extend from the box to the highest and lowest values, excluding outliers. Outliers are represented by asterisks. A line across the box indicates the median. The line across and connecting the two circles in the center of each box plot illustrates the mean scores of the two groups.

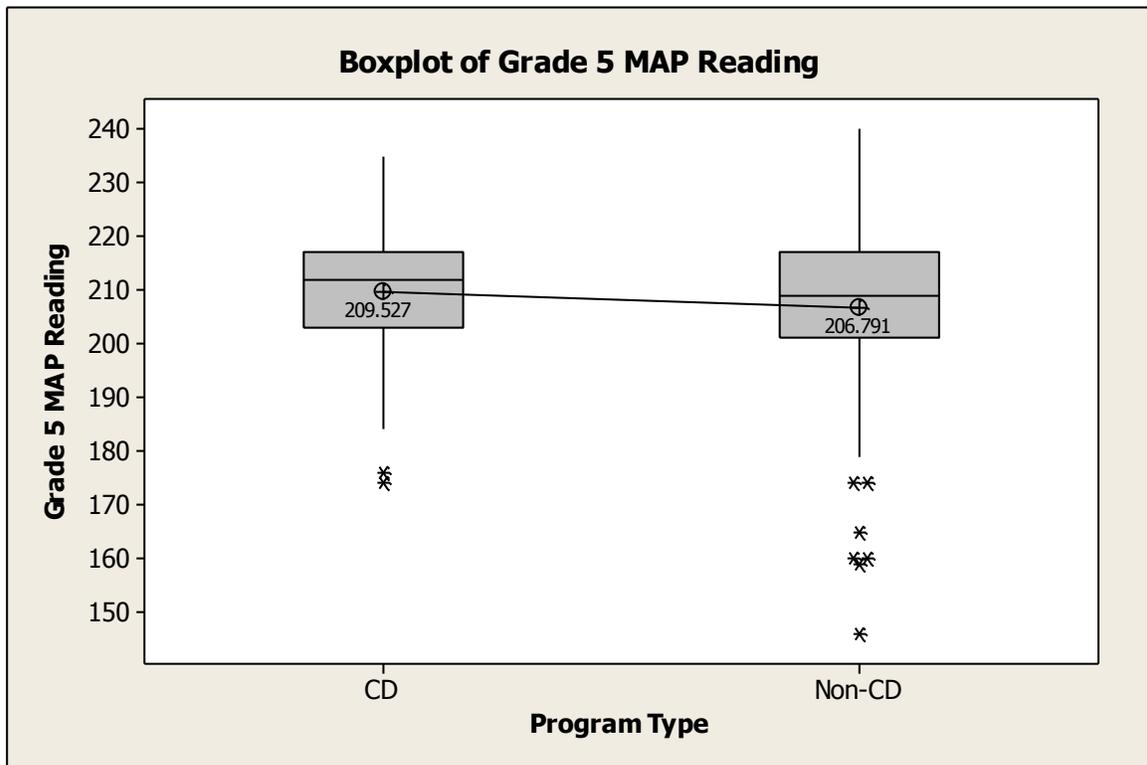


Figure 4.2
Box plot of MAP grade five reading scores by program type

The initial data analysis was conducted to assess if there was a significant difference in reading achievement at fifth grade between students who received early childhood programming services (CD students) and those who did not as measured by Measures of Academic Progress (MAP) reading at a 0.05 alpha level. The null hypothesis states there will be no significant difference in reading achievement at grade five between students who received early childhood intervention services and those who did not receive early childhood intervention services as measured by grade five MAP reading. The alternative hypothesis states there will be a significant difference between the group means at the fifth grade level. The independent variable is the type of program, if any, the child attended. The dependent variable is the reading score based on the grade five Measures of Academic Progress (MAP). Additional research questions were posed

to assess if there is a significant difference in reading achievement at the fifth grade level as measured by MAP reading between factors related to the student’s gender, ethnicity, and lunch status. The null hypothesis states there will be no difference in reading achievement between students related to the factors of gender, ethnicity, or lunch status. The alternative hypothesis states there will be a significant difference between these factors group means.

Because neither data set was normally distributed, Levene’s test for homogeneity was also completed for both of the fifth grade reading score distributions. The assumption is true that the homogeneity of variance was met. The results indicated that $p(0.053) > \alpha(0.05)$. Again, the general linear model of analysis of variance was utilized. The results of the general linear model of analysis of variance revealed no significant model factors. Thus, the null hypothesis could not be rejected for any of the model factors. Program type, gender, and lunch status were all negligible with regard to the fifth grade MAP reading scores. Table 4.5 represents the results from the ANOVA.

Table 4.5
General Linear Model ANOVA of Grade Five Test Score

Source	<i>df</i>	Seq SS	Adj SS	Adj MS	F	P
Program Type	1	411.8	543.8	543.8	2.93	0.088
Gender	1	750.5	286.7	286.7	1.55	0.215
Lunch Status	1	6630.6	573.9	573.9	3.10	0.080
Ethnicity	2	599.1	599.1	299.6	1.62	0.201
Error	214	39655.4	39655.4	185.3		
Total	219	48047.4				

S = 13.6127 R-Sq = 17.47% R-Sq (adj) = 15.54%

Eighth Grade Analysis

Research Question #3: How do these same children who participated in the Charleston County School District Child Development (CD) program during the 2002-2003 school

year compare to the same matched sample of non-Child Development students at the end of their eighth grade year as measured by the Measures of Academic Performance (MAP) Reading assessment?

- a. Do the results vary when data are disaggregated by socio-economic status for the students who participated in the Child Development program?
- b. Do the results vary when data are disaggregated by race for the students who participated in the Child Development program?
- c. Do the results vary when data are disaggregated by gender for the students who participated in the Child Development program?

Table 4.6 shows the group statistics for the mean and standard deviations of scores on the eighth-grade MAP reading of the two groups. Students who received Child Development programming demonstrated a mean reading score of 221.65. Again, the scores of the students who did not receive Child Development programming were similar to those who did receive programming and demonstrated a mean reading score of 220.57 at grade eight.

Table 4.6
Group Statistics for Grade Eight Measures of Academic Progress Scale Scores

Program Type	Number	Mean	Standard Deviation
Child Development	110	221.65	13.35
Non-CD	110	220.57	16.34

In Figure 4.3, the distribution of grade eight reading scores between the Child Development (CD) and non-CD group is presented using box plots. Again, both box plots revealed several negative outliers for both groups. Because of these negative outliers, normal probability plots utilizing Anderson-Darling’s test for normality was

completed for both distributions. The assumption that the distributions of scores were normally distributed was not met because $p(0.012) < \alpha(0.05)$ for the CD group and $p(<0.005) < \alpha(0.05)$ for the Non-CD group.

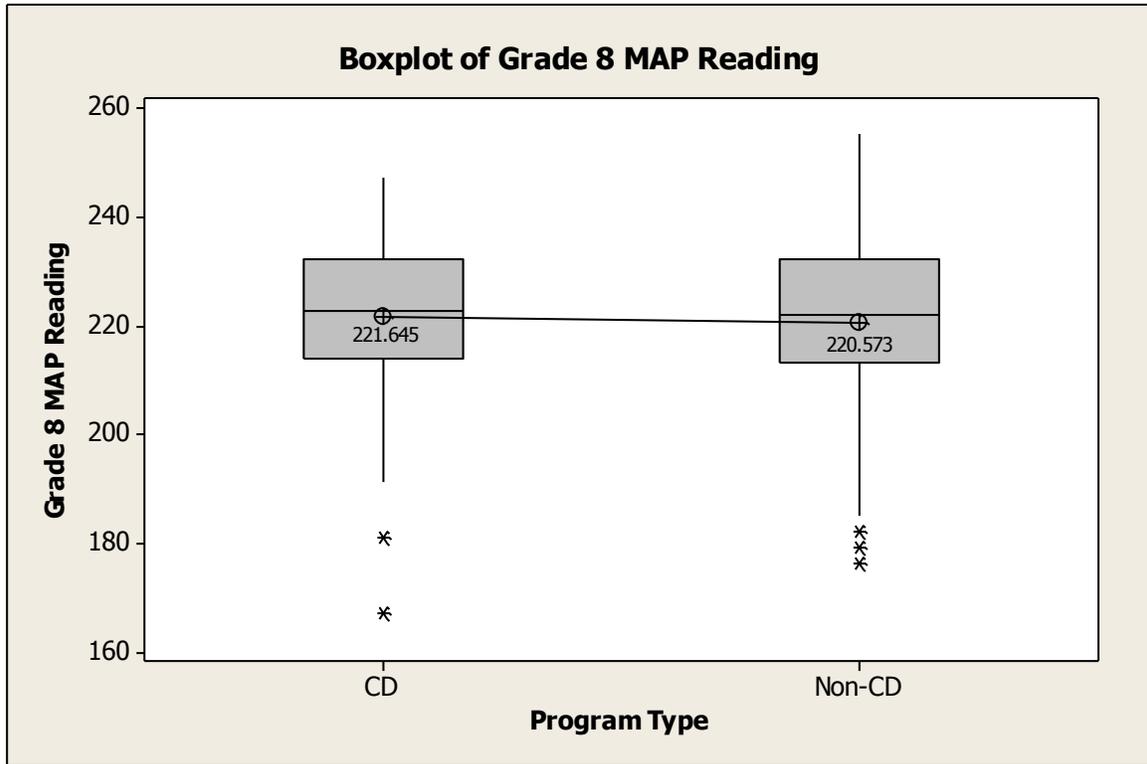


Figure 4.3
Box plot of MAP grade eight reading scores by program type.

The initial data analysis was conducted to assess if there was a significant difference in reading achievement at eighth grade between students who received early childhood programming services (CD students) and those who did not as measured by Measures of Academic Progress (MAP) reading at a 0.05 alpha level. The null hypothesis states there will be no significant difference in reading achievement at grade eight between students who received early childhood intervention services and those who did not receive early childhood intervention services as measured by grade eight MAP reading. The alternative hypothesis states there will be a significant difference between

the group means. The independent variable is the type of program, if any, the child attended. The dependent variable is the eighth grade MAP reading score. Additional research questions were posed to assess if there is a significant difference in reading achievement at the eighth grade level as measured by MAP reading between factors related to the student's gender, ethnicity, and lunch status. The null hypothesis states there will be no differences in reading scores between students related to the factors of gender, ethnicity, or lunch status at grade eight. The alternative hypothesis states there will be a significant difference between these factors group means.

Levene's test for homogeneity was again completed for the grade eight reading scores distributions. The assumption is true that the homogeneity of variance was met. The results indicated that $p(0.172) > \alpha(0.05)$. Once more, because the factors in the model were unbalanced, a general linear model analysis of variance was utilized. The results of the general linear model analysis of variance revealed that Gender, $F(1, 214) = 4.80$ $p 0.029 < \alpha 0.05$ was significantly related to MAP grade eight reading scores. Thus, the null hypothesis for gender was rejected. Program type, lunch status and ethnicity were insignificant. Again, however, the coefficient of determination (R^2) indicated that only 17.6% of the variability in eighth grade MAP reading scores was accounted for by the model factors. Table 4.7 represents the results from the ANOVA at grade eight.

Table 4.7
General Linear Model ANOVA of Grade Eight Test Score

Source	<i>df</i>	Seq SS	Adj SS	Adj MS	F	P
Program Type	1	63.3	105.7	105.7	0.57	0.453
Gender	1	1608.8	899.0	899.0	4.80	0.029
Lunch Status	1	6468.9	697.5	697.5	3.73	0.055
Ethnicity	2	417.5	417.5	208.8	1.12	0.330
Error	214	40042.8	40042.8	187.1		
Total	219	48601.4				

S = 13.6790 R-Sq = 17.61% R-Sq (adj) = 15.68%

Post hoc comparisons, using Tukey method, were conducted for both groups to determine which pairs of the four different group means differed on the MAP grade eight reading scores. These results are given in Table 4.8 and indicate that males ($M = 217.61$, $SD = 15.25$) had significantly lower average eighth grade reading scores than their female ($M = 224.89$, $SD = 10.66$) counterparts within the CD group. All factors were insignificant within the non-CD group.

Table 4.8
Tukey Simultaneous Tests for Grade Eight MAP Reading

(I) Group	(J) group	Mean Difference	Std. error	Sig.	95% confidence interval	
					Lower	Upper
Child Development	Males	-7.374*	2.425	0.0030	-12.18	-2.566
Non-CD	Males	-0.4929	2.911	0.8659	-6.264	5.278

* The mean difference is significant at the 0.05 level

Data Analysis Summary

This study examined the impact of early childhood education on reading achievement of children, kindergarten through eighth grade, who participated in the Child Development (CD) program within Charleston County School District (CCSD) during the 2002-2003 school year. The participating students' achievement was determined by

analyzing their performance on the Measures of Academic Performance (MAP) (Northwest Evaluation Association, 1997) assessment at pivotal points within a child's educational career. The test results were compared to those of a matched group of students who did not participate in the CCSD Child Development program. An examination and comparative study of the implementation of the four-year old Child Development program in Charleston County, South Carolina, provided a more comprehensive evaluation of students' sustained achievement through the primary, elementary, and secondary grades.

This chapter described the demographics of the participants, hypothesis data analysis with regard to the specific research questions posed, and data summary findings. Data were collected following the submission of the Research Proposal to the Charleston County School District's Office of Assessment and Evaluation which was approved on October 10, 2011. Both descriptive and inferential statistical methods were used. The inferential method used was a general linear model analysis of variance with Tukey Method *post hoc* test. Statistical significance for each test utilized was set at 0.05 alpha levels. Hypotheses were tested using the general linear model ANOVA and Tukey Method *post hoc* test. Overall program type was an insignificant variable with regard to the MAP reading scores obtained for each sample set at the second, fifth, and eighth grade levels. With regard to the secondary research questions, females within the Child Development (CD) group, at second and eighth grades had higher MAP reading scores when compared to a match sample of students who did not participate in the CD program. Ethnicity and lunch status were insignificant independent variables with regard to MAP reading scores at each of the three grade levels: grades two, five and eight. Each of the

model factors accounted for approximately 17% of the variability in MAP reading scores at the second, fifth, and eighth grade levels.

Summary

This chapter discussed the results that were obtained through the data analyses conducted. The following chapter will include summary statements, conclusions, and recommendations of the study. The discussion section will address possible reasons why students who received early childhood intervention services had commensurate MAP reading scores as sample peers who did not receive such services.

CHAPTER FIVE

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

This study examined the impact of early childhood education on reading achievement of children, kindergarten through eighth grade, who participated in the Child Development (CD) program within Charleston County School District (CCSD) during the 2002-2003 school year. The participating students' achievement was determined by analyzing their performance on the Measures of Academic Performance (MAP) (Northwest Evaluation Association, 1997) assessment at pivotal points within a child's educational career. The test results were compared with those of a matched group of students who did not participate in the CCSD Child Development program. The study included a review of the history of early childhood education, longitudinal data related to participation in preschool education, and the significance of reading for the students' educational success. Finally, the examination and comparative study of the implementation of the four-year-old Child Development program in Charleston County, South Carolina, provided a more comprehensive evaluation of students' sustained achievement through the primary, elementary, and secondary grades.

Current longitudinal participant samples were determined, largely, based on natural attrition of initial participants between grade two and grade eight from the previous Charleston County School District (CCSD) study that was originally conducted in January 2008. The original 219 matched students were filtered until each sample set included students in second grade, fifth grade, and eighth grade with specific,

individualized Measures of Academic Performance (MAP) reading scores for each grade level. Following that filter, random samples were drawn from both treatment and control groups in a fashion that allowed for a balance in the total number of students in each group. The student sample cohort for the study included 110 former Child Development (CD) and 110 Non-Child Development programming students. The CD sample was comprised of 49 males (44.5%) and 61 females (55.4%).

Data were collected following the submission of the Research Proposal to the Charleston County School District's Office of Assessment and Evaluation which was approved on October 10, 2011. Both descriptive and inferential statistical methods were used. The inferential method used was a general linear model analysis of variance with the Tukey Method *post hoc* test. Statistical significance for each test utilized was set at 0.05 alpha levels.

Interpretation of the Findings

Research Question #1: How do children who participated in the Charleston County School District Child Development (CD) program during the 2002-2003 school year compare to a matched sample of non-Child Development students at the end of their second grade year as measured by the Measures of Academic Performance (MAP)

Reading assessment?

- a. Do the results vary when data are disaggregated by socio-economic status for the students who participated in the Child Development program?
- b. Do the results vary when data are disaggregated by race for the students who participated in the Child Development program?

- c. Do the results vary when data are disaggregated by gender for the students who participated in the Child Development program?

Data indicated that students in the second-grade who received Child Development programming demonstrated a mean reading score of 184.42. The scores of the students who did not receive Child Development programming are similar to the scores of those who did receive CD programming, with a mean reading score of 185.19 at grade two. It is important to note that while the results do not vary between the CD and non-CD groups, the overall mean reading scores for each group are similar to the national norms that were derived from the NWEA 2005 Normative Data sample. The NWEA (2005) Norms Study was created to provide educators with national normative achievement data that can be used to measure or compare the performance of students in the same grade level. Data were obtained from a sample of more than 2.3 million students in 32 states during the 2005 school year. Results from the study indicated that at the second grade level, the national mean Rasch Unit (RIT) score for the fall assessment period was 178.0 and the spring assessment period was 188.2. This indicates that even though there was not a statistical difference between the mean scores of the CD versus non-CD students, overall each of these groups of students within Charleston County was on grade level when compared to the national average of students during the 2005 school year.

Additional research questions were posed to determine if there was a significant difference in reading achievement at the second grade level as measured by MAP reading between factors related to the student's gender, ethnicity, and lunch status. The results of the general linear model analysis of variance revealed that gender was significantly related to MAP second grade reading scores. Thus, the null hypothesis for gender was

rejected. Program type, ethnicity, and lunch status were insignificant. One speculation as to why there was a difference between genders may be related to the curvature that was obtained in the normal probability plot within the second grade data analysis. This is not surprising given the small sample size of each group and the fact that each group was initially drawn from a specific sample of the targeted population that was based on the criteria for entry into the Child Development program (achievement results, parent's socio-economic status, language status, etc). Within the CD group, males ($M=179.78$) had significantly lower average scores on the second grade MAP reading assessment than their female counterparts ($M=188.15$). The difference between gender group means within the Non-CD group was negligible.

Research Question #2: How do these same children who participated in the Charleston County School District Child Development (CD) program during the 2002-2003 school year compare to the same matched sample of non-Child Development students at the end of their fifth year as measured by the Measures of Academic Performance (MAP) Reading assessment?

- a. Do the results vary when data are disaggregated by socio-economic status for the students who participated in the Child Development program?
- b. Do the results vary when data are disaggregated by race for the students who participated in the Child Development program?
- c. Do the results vary when data are disaggregated by gender for the students who participated in the Child Development program?

Data indicated that students in the fifth grade who received Child Development programming demonstrated a mean reading score of 209.53. The scores of the students

who did not receive Child Development programming are similar to the scores of those who did receive CD programming, with a mean reading score of 206.79 at grade five. It is important to note that while the results do not vary a significant amount between the CD and non-CD groups, the overall mean reading scores for each group are similar to the national norms that were derived from the NWEA 2008 Normative Data sample. The NWEA (2008) Norms Study was created to provide educators with national normative achievement data that can be used to measure or compare the performance of students in the same grade level. Data were obtained from a sample of more than 2.8 million students in 42 states during the 2008 school year. Results from the study indicated that at the fifth grade level, the national mean Rasch Unit (RIT) score in Reading for the fall assessment period was 206.7 and for the spring assessment period was 211.1. This indicates that even though there was not a statistical difference between the mean scores of the CD versus non-CD students, overall each of these groups of students within Charleston County was on grade level when compared to the national reading average of students during the 2008 school year.

Additional research questions were posed to determine if there was a significant difference in reading achievement at the fifth grade level as measured by MAP reading between factors related to the student's gender, ethnicity, and lunch status. The results of the general linear model analysis of variance revealed that there were no significant model factors. Thus, the null hypothesis could not be rejected for any of the model factors. Program type, gender, and lunch status were all negligible with regard to the fifth grade MAP reading scores. One item of significant importance at the fifth grade level was the number of statistically significant outliers that were evident for the CD and

non-CD groups. Dawson (2011) stated that at least 30% of samples from a normally-distributed population will have one or more data sets flagged as outliers. By the specific nature of this research study, however, the total sample of 110 students for the CD and non-CD groups is not a normally-distributed population due to the selection criteria for entry in the Child Development program within Charleston County School District. This may explain the relevant nature of these outliers and how those scores contribute to the overall mean within the CD and non-CD groups.

Research Question #3: How do these same children who participated in the Charleston County School District Child Development (CD) program during the 2002-2003 school year compare to the same matched sample of non-Child Development students at the end of their eighth grade year as measured by the Measures of Academic Performance (MAP) Reading assessment?

- a. Do the results vary when data are disaggregated by socio-economic status for the students who participated in the Child Development program?
- b. Do the results vary when data are disaggregated by race for the students who participated in the Child Development program?
- c. Do the results vary when data are disaggregated by gender for the students who participated in the Child Development program?

Data indicated that students in the eighth grade who received Child Development programming demonstrated a mean reading score of 221.65. The scores of the students who did not receive Child Development programming are similar the scores of those who did receive CD programming, with a mean reading score of 220.57 at grade eight. It is important to note that while the results do not vary between the CD and non-CD groups,

the overall mean reading scores for each group are similar to the national norms that were derived from the NWEA 2011 Normative Data sample. The NWEA (2011) Norms Study was created to provide educators with national normative achievement data that can be used to measure or compare the performance of students in the same grade level. Data were obtained from a sample of more than 5.1 million students in 50 states during the 2011 school year. Results from the study indicated that at the eighth grade level, the national mean Rasch Unit (RIT) score in Reading for the fall assessment period was 219.3 and for the spring assessment period was 222.4. This indicates that even though there was not a statistical difference between the mean scores of the CD versus non-CD students, overall each of these groups of students within Charleston County was on grade level when compared to the national reading average of students during the 2011 school year.

Additional research questions were posed to determine if there was a significant difference in reading achievement at the eighth grade level as measured by MAP reading between factors related to the student's gender, ethnicity, and lunch status. The results of the general linear model analysis of variance revealed that gender was significantly related to MAP grade eight reading scores. Thus, the null hypothesis was rejected. Program type, lunch status, and ethnicity were insignificant. Again curvature obtained in the normal probability plot within the eighth grade analysis may have impacted these findings. This is not surprising given the small sample size of each group and the fact that each group was initially drawn from a specific sample of the targeted population that was based on the criteria for entry into the Child Development program (achievement results, parent's socio-economic status, language status, etc). Another item of significant

importance at the eighth grade level was the number of statistically significant outliers that were evident for the CD and non-CD groups. Dawson (2011) stated that at least 30% of samples from a normally-distributed population will have one or more data sets flagged as outliers. By the specific nature of this research study, however, the total sample of 110 students for the CD and non-CD groups is not a normally-distributed population due to the selection criteria for entry in the Child Development program within Charleston County School District. This may explain the relevant nature of these outliers and how those scores contribute to the overall mean within the CD and non-CD groups.

Findings Related to the Literature

Reading achievement in the primary grades is possibly the most important responsibility of educators in kindergarten through fourth grades (Mathes et al., 2005). Snow et al. (1998) have suggested that reading is the primary building block for the greater part of all potential learning experiences. The instructional components through which students acquire literacy are based on a complex set of developmental factors that continue to be debated by educational researchers (Leslie & Allen, 1999). The achievement of successful reading skills is typically established in the early grades and is influenced by the instructional practices that are used during this critical learning period (Mathes et al., 2005). Hsin (2007) stressed the importance of children's learning to read in the primary grades as a necessary component in later reading to learn skill development.

Controversy over the definition of reading readiness and the factors that place a student at-risk within the area of reading proficiency continues to exist despite numerous

research studies and instructional practices. Aspects such as cultural demographics, language usage, and economic status are often considered as contributing to at-risk development (Rodgers et al., 2005). Leslie and Allen (1999) indicated that “the downward spiraling of reading achievement has been proposed as a major determinant of school failure” (p. 404). The ability to read text is vital for independence in one’s daily life; however, the number of students with reading difficulties in the United States is disturbing. Continued concern for the reading abilities of students in the United States has led to increased research efforts and specific educational implications in the areas of early reading curriculum, instruction, and assessment (Wixson & Duto, 1999).

The achievement gap between individual student growth continues to be well documented in the research. Rodgers et al. (2005) indicated that the achievement gap between various demographic groups can be observed as early as the kindergarten school year. Research, as reported by Hsin (2007), indicated that more than 70% of poor readers have difficulties in phonological awareness when in kindergarten. These deficits, as well as continued reading difficulties, have predicted long-term reading failure into the fourth grade. Juel (1988) indicated that 88% of children who scored in the lowest quartile in reading comprehension at the end of first grade remained below the 50th percentile at the end of fourth grade. Numerous studies conducted over the past 25 years have focused on the prevention of developmental reading delays and early intervention for students at-risk for reading problems. Results have suggested that early instruction during the primary grades can be effective in preventing reading difficulties (Mathes et al., 2005). It is, therefore, imperative that administrators and educators implement effective instructional and procedural practices during the early childhood school years to address pre-reading

weaknesses in an effort to reduce the long term reading deficits that have been measured in the past.

Present day changes regarding early childhood programs can be observed in the controversy surrounding the emphasis in early literacy and academic pre-readiness skills prior to the transition into kindergarten (Buysee & Wesley, 2006). Typically, children who are age five by a certain date within the fall semester are considered to be of kindergarten age depending on each state's individually established criteria. Hatfield (2007) argues that a child's developmental age should be taken into consideration despite the chronological age when determining readiness level for kindergarten. As the early learning standards for preschool children change, it is ever more increasingly important that the preschool programs implemented within the school and early childhood development settings learn to differentiate the standards related to literacy and additional academically based concepts in order to meet the needs of each student within the program (Buysee & Wesley, 2006).

Barnett (1998) conducted a critical review of 38 studies to measure the long-term effects of early childhood programming on children living in poverty. Barnett targeted specific studies that measured the effects of early childhood education programs on school success of children living in poverty through at least the third grade. The main questions explored in the review focused on the study of the long-term effects on cognitive development and academic achievement, the economic consequences of these effects, and the impact on public policy and reform. Barnett concluded that the effects on cognition, as measured by intelligence tests, tended to subside after enrollment into elementary school and that the effects on academic achievement, as measured by

standardized assessments, did not decrease over time. The author clarified that in many studies the long-term achievement rates appear to decrease but attributed this to the attrition of participants in the specific studies. He noted that in the true experimental and quasi-experimental studies, lasting effects were measured. Overall school success, as measured by rates of grade retention, special education, and high school graduation, was also favorable for students who participated in early childhood education programs. In conclusion, Barnett proposed that “every child living in poverty in the United States ought to be provided with at least one year of quality education prior to school entry in a part-day preschool education program or a full-day developmental child care program rich in cognitive interactions between teachers and children” (p. 207).

One well known study that measured the long-term economic effects and that conducted a benefits-cost analysis of early childhood education is the High Scope Perry Preschool study (Barnett, 1998). In this longitudinal study, 128 student participants from low income families were followed over a 40-year time period. Analysis of the long-term results were divided into seven categories including custodial child care value, reduced cost of K-12 education, reduced cost of adult education, increased costs of college education, increased earnings and fringe benefits, decreased costs of crime, and decreased costs of welfare (Barnett). The findings demonstrated that children who participated in the child development program were less likely to be retained one or more school years during their academic career, had higher high school graduation rates, made more money when they obtained jobs in the workplace, and had fewer arrests (Charleston County School District, 2008). This longitudinal study clearly demonstrates both the

academic and societal gains that have been acquired by children who have participated in high-quality child development programs during their 4-year-old year.

Finally, a national data base was created by the National Center for Education Statistics through the U.S. Department of Education to further examine the development of students within the United States. The Early Childhood Longitudinal Study (ECLS) program was comprised of three longitudinal cohorts of students and was devised to assess overall child development, school readiness, and early school experiences (Najarim et al., 2010). The ECLS-K study included a nationally representative sample of approximately 22,000 students who were enrolled in kindergarten during the 1998-1999 school year in approximately 1,000 classes throughout the United States. Various studies have been conducted from the data set that was obtained in the ECLS-K project. Horton (2006) summarized these studies and reported that the data collected primarily consisted of direct parental reports regarding each child's previous preschool experience. Results indicated that students who participated in any of the early childcare programs experienced a 1.2 higher reading score and a 0.95 higher math score, which corresponds to effect sizes of 0.12 and 0.10 respectively. However, for children who attended an early childcare program prior to kindergarten, 70-80% of the associated cognitive gains faded out by the spring of first grade, which is equivalent to a statistically significant, yet small effect size of 0.03 for reading and math. It was noted that particular pre-reading gains were larger and sustainable for children from lower socio-economic status with math effects remaining statistically significant for families receiving temporary assistance for needy families (TANF) through the spring of first grade. Also, children from Hispanic families who were center-based experienced a 0.23 SD increase in reading

performance, which is three times the effect size for white children. These results indicate that the achievement gains that are experienced in reading and math achievement in kindergarten, from students who participated in early childcare programs, are evident during their kindergarten and first grade year, yet these results do not appear to continue past that time as they progress through their school careers (Horton, 2006).

The overall results from this study appear to align with the findings of numerous national studies. In this study, there was not a significant difference between the reading achievement scores of students at the second, fifth, and eighth grade levels. This is similar to the findings from Horton (2006) in the ECLS-K project study in which the initial achievement difference subsided in overall performance after the first grade. Additionally, it is similar in nature to the findings from Barnett (1998) in which he concluded that the effects on academic achievement appeared to decrease over time. Barnett attributed this to the attrition of participants in the specific studies. Similar to Barnett's conclusion, attrition of participants also may have played a key role in the nature of the overall reading achievement findings in this current study as well. The initial study conducted by the CCSD Office of Assessment and Accountability (2008) included a population sample of 1,260 students who participated in the Child Development (CD) program during the 2002-2003 school year. Of those CD students, 711 met the initial criteria for selection in the study. When the matching process initially occurred, which included the variables of race, gender, free/reduced lunch status, ethnicity, and school of attendance at kindergarten, 219 students resulted in the sample for each group (CD versus non-CD participation). The specific data for this current study indicated that of those original 219 students, only 110 met the new matching criteria

which included participation in the MAP assessment at the second, fifth, and eighth grade level as well as non-retention at any grade. This decrease in the total number of students may be due to natural student attrition that may be influenced by grade level retention, transfer out of district, inability to participate in MAP testing due to various factors, or possible enrollment in a charter, magnet, or private local school, which are factors to consider due to the school choice options within Charleston County.

The student sample of 110 former Child Development (CD) was comprised of 49 males (44.5%) and 61 females (55.4%) and the 110 non-Child Development (Non-CD) group was comprised on 54 males (49.1%) and 56 females (50.9%). These demographics were statistically similar to the originally matched cohort of 219 students from the initial study. Of that cohort, within the CD and non-CD sample, 47% were male and 53% were female. The slight differences in male and female participation of this current study when compared to the original study may account for the statistically significant gender difference noted at the second and eighth grade levels. At each level, gender was significantly related to MAP reading performance.

Future Recommendations

It is important to note that each of the model factors (program model, gender, lunch status, and ethnicity) accounted for approximately 17% of the variability in MAP reading scores at the second (16.24%), fifth (17.47%), and eighth (17.61%) grade levels. This calculates to approximately 83% variance that is not attributed to any of the specific variables that were measured in this study. The reasons why this percentage is such a large factor are difficult to discern in educational research studies and are unclear at this time. The variance measured may be attributed to possible factors that are not

quantifiable in their nature such as social factors, parental influence, impact of teacher effectiveness, individual student cognition abilities, and curriculum effectiveness. This study only examined whether the core components of program type, gender, lunch status, and ethnicity impacted overall reading achievement. Therefore, future researcher could investigate other variable components such as teacher quality, attendance rates, discipline referrals, and instructional methods to determine if the results vary based on those additional potential factors that may influence the approximate 83% variance noted in this study.

In the literature review, Barnett (1998) also found this factor of variance in the 38 studies that he reviewed that measured the long-term effects of early childhood programming on children living in poverty. He stated that in many of the studies analyzed, the achievement rates appeared to decrease, and he explained that only in true experimental and quasi-experimental studies were lasting effects in the area of long-term reading achievement measured. Multiple factors can contribute to the findings derived from educational research that cannot be controlled for in true experimental or quasi-experimental studies. These include difficulties in controlling such factors that are not quantifiable and/or are uncontrollable in the educational setting. It is hypothesized by this researcher that these factors may have impacted the overall results of this study due to the limited sample size that naturally occurred through the attrition of students between Child Development/kindergarten and eighth grade in Charleston County School District (CCSD).

Additionally, through meta-analysis of multiple research studies, Barnett (2008) stated that the studies with the strongest methodology have found the more lasting

positive effects of early care and education in the areas of cognitive and social benefits. He indicated that much of the evidence supporting early care and education is derived from review of multiple, rigorous studies that have been replicated with various samples of students with differences in program design and in the populations served. Barnett (2008) stated that “these studies provide a sound basis for conclusions about the benefits of publically funded preschool education, and they can help inform key decisions about who to serve and how programs should be designed” (pp. 19-20). Again, due to the limited nature of this study, these results should be interpreted with caution because of the small, non-randomized sample size and use of archived data that may not necessarily represent the total ethnic diversity of the school district at this time nor the potential changes in curriculum over the past ten years that may have impacted the overall results.

One possible future study that could attempt to control some of these factors is a balanced ANOVA in which the total number of students is equal in gender, ethnicity, and lunch status for the CD and Non-CD groups. This type of analysis will certainly decrease the sample size substantially but may be useful in determining if such factors influence long-term reading achievement between these two groups of students in a more controlled manner. In order for this study to be conducted, future researchers may need to obtain a different matched sample database that includes a more ethnically diverse student sample that also more closely aligns with the ethnic diversity within Charleston County School District at this time compared to what was evident during the 2002-2003 school year.

Another recommendation for future research includes further exploration of these students and the potential effects of participation in the CD program on student

socialization skills including the number of discipline referrals and the rate of retention. Horton (2006), analyzed additional data in the area of behavioral performance which indicated that participation in early childcare programming had a small, but statistically significant, negative effect on the student's overall externalizing behaviors and negative behaviors associated with self-control. Further data that were collected measured the retention rate of students who participated in early childcare programs. Results indicated that participation in both Head Start and other center-based program options is associated with a 2% reduction in the rate of kindergarten retention. Horton stated that 7.5% of the overall study sample was retained; therefore, it is important to note that these results suggest that participation in early childcare programs resulted in a 27% rate of reduction in possible retention during the student's kindergarten year. It may be interesting to conduct a similar data analysis with this matched sample of students to measure the overall discipline referral statistics and the retention rates of these students at multiple grade levels which may have also contributed to the decrease in sample size.

Finally, the initial study conducted by the CCSD Office of Assessment and Accountability (Charleston County School District, 2008) evaluated the academic achievement performance of students who participated in the Child Development (CD) program with a matched sample of students who did not participate in Child Development (non-CD) on the Palmetto Achievement Challenge Test (PACT) at the third grade level. Results were conducted through *t*-test analysis of the 219 students and indicated that a statistically significant difference was measured between CD versus non-CD performance on the PACT English Language Arts (PACT ELA) and PACT Mathematics (PACT Math), with the CD students performing higher in both PACT ELA

and PACT Math than those students who had not participated in the CD program. A future study could re-analyze the data through similar data analysis procedures as this study for those same students at the third grade level through the use of inferential methods including a general linear model of analysis of variance with the Tukey Method *post hoc* test to determine if similar findings are obtained. Statistically, the use of the *t*-test may not have accurately measured the difference between the CD and non-CD participants due to the originally larger sample size.

Recommendations for Action

The data obtained for this study were collected following the submission and approval of the Research Proposal to the Charleston County School District's Office of Assessment and Evaluation on October 10, 2011. The researcher will provide the school district with a copy of the results of this study for its review. In 2008, Charleston County School District created the *Charleston Achieving Excellence (CAE) Plan* as an addition to the *Charleston Plan for Excellence*. The *Charleston Plan for Excellence* was a district initiative that increased school choice options, provided facility improvements, created innovative literacy, child health, and fine arts partnerships and focused on data-driven decision-making procedures including a coherent curriculum and the "Excellence is our Standard" belief that all children can achieve. The *Charleston Achieving Excellence (CAE) Plan* is a three-year vision that seeks to 1) elevate the achievement of all students, 2) close the achievement gap, and 3) increase the graduation rate. The district identified three core values [*Results, Access, and Partnerships*] that provide the foundation for the *CAE Plan*. This conducted research study may assist district leaders in the evaluation of the *CAE* by specifically adding to the body of knowledge in Charleston County School

District related to the core values of *Results: Rigor and Relevance* and of *Access: Equity and Choice* as well as to the *Partnerships: Respect and Relationships* core values of the CAE.

In the core values area of Results, this conducted study may provide the district with valuable data related to the long-term reading achievement results of students who participated in the CCSD Child Development Program through the specific analysis of student performance on a nation-wide assessment at pivotal years within the child's educational career. While the results of this study indicated that there was not a statistical difference between the reading achievement MAP scores of students who participated in CD versus a matched sample of students who did not participate in CD, the data did indicate that both groups of students did meet the national average for on-grade level performance when compared to the NWEA 2005, 2008, and 2011 normative data. To address the Access core value, this study may provide parents of potential students and community stakeholders within Charleston County more knowledge regarding the possible long-term educational benefits of participation in the district-provided 4-year-old Child Development program. This may assist those parents who are seeking choice options for their 4-year-old student between possible enrollment in the CCSD Child Development program or in parentally placed private child development centers. Finally, through the Partnership core value, this study may help foster continued respect and relationships between the district and colleges/universities within South Carolina who are seeking permission for data to assist with research projects.

The results of the study closely align with the *Charleston Achieving Excellence Plan* by evaluating the reading achievement of students who participated in the Child

Development program through the analysis of a selected group of students' performance on a nationally administered assessment. Analysis of the achievement gap in CCSD among socio-economic status, gender, and race was also conducted. Results indicated that there was a measurable difference in gender at the second and eighth grade levels, with females outperforming males in the area of reading achievement. Further, this research study may add to the body of literature that continues to assess the benefits of early childhood education and its impact on long-term reading achievement. There is also the potential for future research studies to measure the actual graduation rate of these students after their twelfth grade school year.

Concluding Statements

During the 2010-2011 school year, Charleston County School District increased the number of Child Development programs offered for families within the county. The expansion of the CD programs within CCSD has progressed from eight half-day program schools with an enrollment of 216 half-day students and one early learning center during the 2005-2006 school year to the present day 83 full day classes in 44 schools with the enrollment of 1,880 students, seven half-day programs, and five early learning centers during the 2010-2011 school year. The Director of Early Childhood Education in CCSD indicated that the district's current theory of action proposes that the increase in the number of programs, coupled with effectively implemented curriculum that is matched to student need in a developmentally appropriate manner, will improve school readiness. It is believed that these changes may reduce the need for remedial programs in CCSD.

Sound research, evaluating the short term as well as long term effectiveness of the CD programs within CCSD, is required in order to measure the longitudinal impact of

participation in CD during the four-year old preschool experience. Through this conducted study, specific data related to long-term reading achievement gains were assessed by student performance on a nationally recognized measure to determine the impact of a student's participation in the Child Development program within CCSD in the area of reading achievement. It was concluded that the overall program type was an insignificant variable with regard to the MAP reading scores obtained for each sample set at the second, fifth, and eighth grade levels. With regard to the secondary research questions, females within the Child Development (CD) group, at second and eighth grades had higher MAP reading scores when compared to a matched sample of students who did not participate in the CD program. Ethnicity and lunch status were insignificant independent variables with regard to MAP reading scores at each grade level assessed.

Americans often state that children are “our most precious natural resource” (Grubb, 1989, p. 358). History, however, has demonstrated that varying changes and restrictions in implementing early childhood education and care have occurred despite this belief system within the general population. Gorey (2001) stated the following:

Conventional wisdom certainly seems to support the notion that educational experiences early in childhood are beneficial. This is particularly true when considering compensatory preschool programs that are designed to serve children who, for any number of social or economic reasons, are at greater than average risk of experiencing learning difficulties. One envisions the educational intervention filling the gaps, compensating for the relative lack of developmental opportunities experienced by children who, for example, live in extremely poor, segregated neighborhoods. Therefore, hypotheses typically advanced about

expected intelligence and academic achievement gains and improved academic and other like successes because of various compensatory preschool interventions, hold a good deal of practical face validity. However, our understanding of the true effects of early childhood education arguably remains debatable, and unfortunately, the debate takes place more often in political rather than scientific forums. Given the lack of any recent integrative study of this topic, such a scientific investigation is needed to inform social scientists, educators, and policy makers. (p. 9)

Educational leaders are charged with making informed decisions regarding various aspects that affect the overall achievement of students. These leaders attempt to seek balance between the managing and leadership sides of academia. Viewing the issues through the structural, human resource, political, and symbolic frames can help leaders decipher alternative approaches to the challenging decision making process (Bolman & Deal, 2003). While contributing to the body of literature regarding longitudinal reading achievement, this study may also assist school leaders and policy makers' efforts within Charleston County as they measure the sustained academic achievement performance of this selected group of students. In addition, other stakeholders such as parents, caregivers, educators, and community members may benefit from knowing these results. Finally, these results as well as additional studies that are structured similarly to this study could be used to assist educational leaders in evaluating early childhood educational reform and as evidence to maintain said programs regardless of growing economic concerns regarding investment in early intervention programs. Numerous legislative ideas, funding initiatives, programming standards, and practicing

guidelines for early childhood education programs have been introduced (Buyssee & Wesley, 2006). The quality and effectiveness of these programs continue to be debated today.

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