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Entry Age and Reading Level by the End of Third Grade

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A dissertation  
presented to  
the faculty of the Department of Educational Leadership and Policy Analysis  
East Tennessee State University  
In partial fulfillment  
of the requirements for the degree  
Doctor of Education in Educational Leadership

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by  
Tony L. Dalton  
December 2011

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Dr. Virginia Foley  
Dr. Eric Glover  
Dr. Donald Good  
Dr. Elizabeth Ralston

Keywords: Kindergarten, Age, Gender, DIBELS, Redshirting, Reading

## ABSTRACT

### Entry Age and Reading Level by the End of Third Grade

by

Tony L. Dalton

This study was conducted to see if a difference exists in the mean Dynamic Indicators of Basic Early Literacy Skills: Oral Reading Fluency scores of students who entered kindergarten as 4 year olds, 5 year olds, and 6 year olds inclusively. Specifically, this dissertation considered the possibility that holding children out of kindergarten an extra year increased their reading level, while sending children to school too young delayed their ability to read and comprehend.

A quantitative study was used to find differences between the mean reading levels at the end of 3rd grade for students who entered kindergarten on or after the age of 4 but before 5, those who entered between the ages of 5 and 6 and those who entered kindergarten after turning 6 years old. A quasi-experimental design was selected because preexisting data were collected on 1,384 third grade students in an East Tennessee school system. The scores from the Dynamic Indicator of Basic Early Literacy Skills assessment (DIBELS) were collected for each of the students in the study. The population included students who were enrolled in 3rd grade beginning with the 2003 school year and ending with students enrolled in the 3rd grade during the 2009 school year.

This study found a significant difference in the means of the DIBELS Oral Reading Fluency (ORF) scores for students who entered kindergarten on or after turning 5 years old and those that entered kindergarten on or after their 6th birthday. No differences were found between males and females of any entry age. Students who started kindergarten on or after the age of 5 but before 6 years read more words in 1 minute than students who started kindergarten on or after the age of 6 years. There were no significant differences for the Oral Reading Fluency scores among the students who entered kindergarten on or after their 4th birthday but before their 5th birthday and the other age groups.

## DEDICATION

Mom and Dad, thank you for always supporting me and for loving me unconditionally. You have always set a good example for me to live by and taught me how to treat others with love and respect. You have believed in me when those around me did not, and encouraged me to follow my dreams and be the best I can be. I have been blessed with the best parents, and it is an honor to be your son. I could never thank you enough for everything you have done and everything you have sacrificed for me, and I will love you forever.

To my brother Randy, my biggest hero, my admiration for you is endless. Your determination and hard work have paid off, and you deserve everything! Thank you for setting a wonderful example of giving to and helping others without the need for recognition but just for the joy of giving! I am thankful that you accept me for who I am, and you are the man I strive to be. I love you brother.

To Dawn, who has always been the sister I never had. You have always been an ear to listen, a voice to guide, and a heart to love and support. I admire you so much for your dedication to your family and for those around you. I love you and thank you for setting an example of what a true servant heart should be.

To my niece Danielle and my nephew Dustin, you have brought a joy and excitement to my life that I have never experienced. The world is yours, you both are destined for greatness, and I could not be prouder or love you more.

Finally, to David, who has always believed in me and showed me what it means to persevere over life's tough obstacles. Thank you for believing in me, helping me in so many ways, and for always seeing my potential. You are the best!

## ACKNOWLEDGEMENTS

I would like to acknowledge the time and efforts of my graduate committee members: Dr. Virginia Foley, Dr. Eric Glover, Dr. Donald Good, and especially Dr. Elizabeth Ralston who was with me at the beginning of this journey as my student teacher supervisor and is now serving on this committee as one of my committee members.

I would also like to acknowledge the friendship, support, enthusiasm, and encouragement of my friends Rodney Collins, Eddie Kyker, and Travis Kanipe. A better group of friends cannot be found.

I also acknowledge the contributions of my cohort in crime: Janet Dalton, Kim Dyke, Krista Crum, Christy Hogan-Young, Amy Cannon, and Jeff "Math Man" Kinser. I am glad we had each other to lean on, to keep each other informed, and to encourage one another toward this goal.

I would also like to acknowledge the guidance and encouragement of the Assistant Director of Schools, Dr. Brenda Dean of Hamblen County, for allowing me the various opportunities to learn and grow as a leader.

Finally, I would like to acknowledge the numerous colleagues and students I have had the pleasure of working with over the years. You have inspired me to be a better educator and person.

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# CHAPTER 1

## INTRODUCTION

Over the past decade our country became increasingly concerned with the high numbers and economic consequences of high school dropouts. In 2007 nearly 6.2 million young people (16% of the 16-24 age group) were high school dropouts, and every student who did not complete high school cost our society an estimated \$260,000 in lost earnings, taxes, and productivity (Riley & Peterson, 2008). According to some of our military experts, the current pool of qualified high school graduates was neither large enough nor skilled enough to supply our nation's workforce, higher education, leadership, or national security needs (Sum, Khatiwada, & McLaughlin, 2009). In 1965 President Lyndon Johnson supported the Head Start program as an action taken in the national defense because too many young Americans could not pass the military's basic skills entrance test. At the time this dissertation was written an estimated 75% of Americans aged 17 to 24 could not join the U. S. military most often because they were poorly educated, involved in crime, or physically unfit according to a report by Mission: Readiness (2009). As we became an increasingly global and technological economy, employers struggled to find enough educated and competent workers, and our community colleges and other higher education institutions spent considerable time and resources on remedial coursework for students who were not prepared for postsecondary education despite having earned a high school diploma. Awareness of these realities produced a common sense consensus around the need to invest in dropout prevention, but the process of dropping out began long before a child reached high school. Loss of interest and

motivation in middle school, often triggered by retention in elementary school and the struggle to keep up academically, led to the student dropout rate. Why were our students being retained? A major cause of retention was failure to master the knowledge and content needed to progress to the next grade level. In many of these cases, it was the result of not being able to read proficiently. The less-recognized but equally urgent fact was the pool from which employers, colleges, and the military draw was too small, and still shrinking, because millions of our American children reached the third grade without learning to read proficiently. The shortfall in reading proficiency was especially pronounced among low-income children. An estimated 4.3 million children were born in the United States in 2010, and those children will leave third grade in 2018-2019 (U.S. Census Bureau, National Population Projections: 2010-2050). Of the third graders who took the National Assessment of Educational Progress (NAEP) reading test in 2009 fully 83% of children from low-income families and 85% of low-income students who attended high poverty schools failed to reach the “proficient” level (U.S. Department of Education, 2009). A similar shortfall occurred for low-income students attending schools in cities, suburbs, towns, and rural areas where as much as 85% failed to meet the proficient level, and the statistics were not much better for NAEP’s lower achievement level. This “basic” level indicates partial mastery of prerequisite knowledge and skills. Forty-nine percent of all low-income test takers in third grade and 53% of those who attended high poverty schools did not reach NAEP’s basic level. For those who viewed school success as a beacon in the battle against intergenerational poverty, scores such as these were profoundly disappointing. These struggling students could become our nation’s lowest paid, least skilled, least productive, and most costly citizens of tomorrow.

Simply put, a dramatic reversal concerning reading instruction was needed in our schools. If our students did not become proficient readers, the United States would lose a growing and essential proportion of its human capital, and the price would be paid not only by individual children and families but also by the entire country.

In March 2009 President Barack Obama said, “The relative decline of American education is untenable for our economy, unsustainable for our democracy, and unacceptable for our children, and we cannot afford to let it continue.” (as cited in Annie E. Casey Foundation, 2010, p. 4) In his 2003 State Of The Union Address, President George W. Bush said, “All skills begin with the basics of reading and math, which are supposed to be learned in the early grades of our schools. Yet for too long, for too many children, those skills were never mastered.” (as cited in Annie E. Casey Foundation, 2010, p. 8) Reading proficiently by the end of third grade, according to the previous NAEP statistics, was a major benchmark in a child’s educational development. According to the Children’s Reading Foundation up until the end of third grade most children were learning to read, but half of the printed curriculum was incomprehensible to students who read below that grade level, and three quarters of students who were poor readers in 3rd grade remained poor readers in high school according to researchers at Yale University (1999). Not surprisingly, students with relatively low literacy achievement tended to have more behavioral and social problems and higher rates of retention in subsequent grades (Miles & Stipek, 2006). The National Research Council asserted that academic success as defined by high school graduation could be predicted with reasonable accuracy by knowing someone’s reading skill at the end of third grade (Snow, Burns, & Griffin, 1998).

This study examined the differences in the mean Oral Reading Fluency scores at the end of third grade for students who entered kindergarten at the ages of 4, 5, or 6 inclusively. Research has shown consistently that kindergarten children who demonstrated strong prereading skills such as phonological awareness and letter-sound understanding were more likely to become strong readers in later grades (Snow et al., 1998). The purpose of this study was to investigate whether a difference exists between the mean reading level at the end of 3rd grade for students who entered kindergarten on or after the age of 4 but before the age of 5, those students who entered school on or after the ages of 5 but before 6, and those students who started kindergarten after turning 6 years old. Another aim was to find out if gender was a contributing factor to a student's reading level at the end of third grade. Finally, third grade students' reading assessment levels and the age of those students were examined in the study to see if there was a significant difference based on age and gender. A quantitative study was used to examine the possible relationship between kindergarten entry age and third grade reading level. A quasi-experimental design was selected because the data already existed and collecting additional data was unnecessary. One thousand three hundred eighty-four third grade students in an East Tennessee school system comprised the population of this study.

#### *Statement of the Problem*

This study addressed the issue of whether there is a significant difference in the reading level of third grade students at the end of the school year and the age and gender of those students when they entered kindergarten. At the 1989 Education Summit in Charlottesville, VA, President George H.W. Bush and the nation's governor's reached a

groundbreaking accord on six national education goals produced by a panel chaired by then Governor William J. Clinton. The goals adopted in 1990 promised a generation of American children would start school ready to learn, the high school graduation rate would reach at least 90%, all students would demonstrate competency over challenging subject matter, U.S. students would be first in the world in math and science achievement, every school would provide an environment conducive to learning, and all adults would be literate and able to compete in a global economy. AMERICA 2000, the strategy President Bush proposed in 1991 to carry out the education goals, called for new world standards for what students should know and be able to do and for schools that would produce extraordinary gains in student learning. In 1994 President Clinton's Goals 2000: Education America Act codified into law the goals promoted by AMERICA 2000; added two more to improve teacher professional development and parent participation; and challenged every community, every school, and every state to adopt national standards of excellence. A challenge was also levied to measure whether schools were meeting those standards. Seven years later, passage of President George W. Bush's No Child Left Behind Act legislation that Democratic Senator Edward Kennedy helped move through Congress promised Americans that all students would become at least proficient in reading and language arts, be taught by highly qualified teachers, and graduate from high school. By 2014 The No Child Left Behind Act required all children in America's schools be proficient in reading and mathematics (U.S. Department of Education, 2004). The reality was that many children continually struggled to read, had low self-confidence, and seemed to lack the motivation to learn (Armbruster, Lehr, & Osborn, 2001). Armbruster et al. found several factors impacting a student's performance

in reading: phonemic awareness, phonics, fluency, vocabulary, and comprehension of the text. In 1997 the United States Congress charged the director of the National Institute of Child Health and Human Development, who was to consult with the Secretary of Education, to appoint a national panel to evaluate the efficacy of research-based knowledge about teaching children to read in addressing the growing concerns of the nation. The National Reading Panel was established in response to this mandate. The panel presented conclusions to the Congress and the public in early 2000. Research-based early literacy skills were taught in the primary grades; however, state curriculums did not address the impact of readiness on acquiring these skills. The National Education Goals Panel (1996) identified a complex set of needs that must be met for a child to be ready to learn: physical well being and motor development, social and emotional development, attitudes toward learning, language usage, cognition, and general knowledge. These factors hinted at physical and mental maturity as a requirement for successful learning. While age was not a direct indication of a child's level of maturity, research showed that students who entered school before they were physically and mentally ready tended to progress at a slower rate and performed significantly worse on assessments than their more developed peers (Meisels, 1999). Readiness then became an issue when determining if a child was ready for kindergarten. Hickman (2006) reported findings that suggested differences did exist between kindergarten entry age and performance on reading and math assessments. More data were required for parents, teachers, and administrators to make choices that could have negatively impacted the educational experiences of a child.

### *Research Questions*

1. Is there a significant difference in the mean reading level of third grade students at the end of the school year by the kindergarten entry age of students who entered school on or after the age of 4 but before 5 years old, those who entered after the age of 5 but before 6 years old, and those who entered kindergarten after turning 6 years old?
2. Is there a significant difference in the mean reading level of 3rd grade students at the end of the school year by gender?
3. Is there a significant difference in the mean reading level of students in the 3rd grade at the end of the school year as measured by the Oral Reading Fluency (ORF) portion of the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) as a function of a combination of kindergarten entry age and gender?

### *Significance of Study*

An investigation of kindergarten entry age and its impact on student achievement was vital for making decisions about when children should begin school. Competence in preacademic and academic skills was a key outcome that affected many areas of a child's life. Children with these skills in early childhood had an advantage as they sought success in school. School-age children with academic competence were more likely to complete school successfully, seek higher education, and get higher paying jobs. Academic competence also had important effects on self-esteem and motivation. Children who completed academic tasks successfully felt more confident of themselves and were more motivated to continue trying academic endeavors. In contrast, children who experienced repeated academic failure were more likely to give up and stop

trying in school, a condition known as learned helplessness (Johnson, 1981). Meisels (1999) posited that children were successful only if they were ready in body and mind. The study provided additional data that kindergarten entry age (4 or 5 years old) can potentially have a negative effect on students' reading performance by the end of third grade. If age and gender have an effect of reading levels and academic growth of students, these factors should be considered when established school entrance age.

### *Definition of Terms*

*Redshirting* is the practice of postponing an age-eligible child's kindergarten entry by a year, typically one whose birthday is very close to the cut-off date. Academic redshirting is often done in order to provide some extra time for social, intellectual or physical maturation. In rare cases a child may be academically redshirted in order to give him the advantage of an extra year's development when playing sports in high school (Amanda Morin: *School-Age Children* Contributing Writer). *Theft of Opportunity* is the potential for depriving children important learning opportunities by delaying kindergarten entry (Graue & DiPerna, 2000).

### *Limitations and Delimitations*

A potential limitation was the inflated results of student reading levels gathered from the spreadsheets submitted by teachers. A survey of the spreadsheets completed by third grade teachers and submitted to the LEA's department of instruction was necessary to collect information regarding possible limiting variables such as previous preschool status, retention, and Title I school enrollment.

### *Overview of the Study*

A quantitative study was used to find differences between the mean reading levels at the end of third grade for students who entered school on or after the age of 4 but before 5, those who entered kindergarten on or after the age of 5 but before 6, and those who entered kindergarten after turning 6 years old. A quasi-experimental design was selected because preexisting data were collected on 1,384 3rd grade students in an East Tennessee school system. The scores from the Dynamic Indicator of Basic Early Literacy Skills assessment or DIBELS were collected for each of the 1,384 students. The DIBELS scores indicated the students' level of progress at the end of third grade. The population included students who were enrolled in third grade beginning with the 2003 school year and ending with students enrolled in the third grade during the 2009 school year.

## CHAPTER 2

### REVIEW OF RELATED LITERATURE

Children must be ready to succeed when they get to school (cognitively, socially, emotionally, and physically) before they can learn to read there. It is also extremely important for students to attend school regularly to continue their growth in learning to read. Although educators do not have complete control, it would be nice if all children were given high quality learning opportunities that began at birth and continued in school and during out of school time, including summers, in order to sustain learning gains and not lose ground. Students need a content rich, demanding curricula aligned with powerful instruction by well-trained teachers, but these students must attend school regularly to receive this instruction. Many times, students miss too many days of school to have a reasonable chance of making a year's progress during the school year. Moreover as teachers can attest even those children who are present, engaged, and learning during the school year return to school at the end of summer significantly behind where they were at the end of the prior school year. Similarly, because the problem of summer learning loss is so prevalent, it is not unreasonable to expect curricula components designed to provide some accelerated refresher and review. The work of the National Summer Learning Association and others suggests that the solution to summer learning loss may lie not only in expanding access to language-rich summer learning opportunities but also in more innovative and widespread deployment of technology. Many schools, libraries, and community-based programs help children and their families use technology for reading and learning and encouraging more children to use online tools and games for self-directed or group learning projects. Unfortunately, those in

education cannot require that each community provide these types of services, and these essential conditions are beyond their control. For low-income children in particular these conditions begin a readiness gap that fuels much of what has become known as an achievement gap. Readiness includes the support of a strong family, being in good health, feeling safe, and having positive social interaction skills, language skills, behavioral and emotional self-control, physical skills and capacities, and the motivation to learn.

At times this achievement gap may begin at birth. Haskins and Sawhill (2009) in *Creating an Opportunity Society* point out that children are not born with an equal chance at the American Dream, and one of the most basic early differences has to do with health at birth. Low-birth weight babies are at greater risk than normal-weight babies for neurodevelopment problems. These include cerebral palsy, blindness, mental retardation, behavioral problems, and attention deficit hyperactivity disorder (ADHD), all of which can interfere with learning and school success (Case & Paxson, 2006). Data taken from KIDS COUNT show that 8% of all children nationally have low birth weight, but the percentage (10%) is higher for children born to low-income mothers than for (6%) higher-income children. Newborns whose mothers have low levels of education are more likely than newborns of more-educated mothers to have been exposed prenatally to cigarette smoke, alcohol, drugs, and folic acid deficiencies, which can cause preterm birth, retardation, and long-lasting effects on the child's cognition and behavior.

This readiness gap can continue from between birth and kindergarten due to differences in children's resources and opportunities for physical, linguistic, cognitive, social, emotional, and behavioral development. Disparities in developmental outcomes emerge in infancy and continue to widen in toddlerhood; therefore, by the time children

from low-income families enter kindergarten, they are typically 12-14 months below national norms in language and prereading skills (Currie, 2005). Almost 10% of low-income children under age 8 have a physical or mental health condition that limits their activities compared with 6% of middle-income children (Newacheck & Halfon, 1992). Many of our children who come from these low-income homes lack early interactions that foster linguistic development including verbal interactions with their parents, being read to, and access to books in their home (Brooks-Gunn & Markman, 2005).

Vocabulary development by age 3 has also been found to be an indicator of reading achievement by third grade (Hart & Risley, 1995). Preschoolers whose mothers have read to them and sung songs with them develop a much larger vocabulary than those children whose mothers have not (Brooks-Gunn & Markman, 2005). These students with larger vocabularies become better readers and perform better in school. Students who did not receive this stimulation during their early childhood tend to arrive at school with measurably weaker language, cognitive, and memory skills (National Institute of Child Health and Human Development, 2000). Sadly, by age 3 children from wealthier families typically have heard 30 million more words than children from low-income families (Hart & Risley, 2003). Many of these children do not develop the emotional and social skills needed to function in a structured learning environment like school before they reach school age. These skills, which are just as essential as cognitive skills for school success, include the ability to follow directions, manage emotions, share, take turns, work cooperatively and independently, take responsibility, and complete an assigned task. Low-income children who are rated relatively high on social skills in kindergarten and first grade tend to have better literacy skills than children with low social

skills ratings, a trend that continues in to third grade (Miles & Stipek, 2006). Between 9% and 14% of children ages birth through 5 experience socio-emotional problems that negatively impact their function, development, and school readiness (Cooper, Masi, & Vick, 2009). Due to funding issues many districts can offer little or no financial assistance for low-income children to attend preschool. Nationally only 47% of 3- and 4-year olds are enrolled in a preschool program of any kind (Education Week, 2010). Our state-funded programs, arguable the type most affordable for low-income families, served only 24% of 4-year-olds in 2008 (Duncan, 2009). Even our federally funded Early Head Start program serves only 3% of infants and toddlers from eligible low-income families, nationally (Brunner, 2009). This readiness gap becomes an achievement gap once these children enter our schools and can persist over the students' school experience.

McKinsey and Company found a gap of 2 to 3 years of learning between low-income and higher-income students in its analysis of average NAEP scores (McKinsey & Company, 2009). This statistic is a strong argument for the need of ensuring our public schools teach to high standards and fulfill the expectation of giving equal opportunity to all children.

Policy and Educational leaders of both political parties have recognized the importance of readiness in the Goals 2000: Educate America Act, signed into law in 1994, which called for all children to have access to high-quality, developmentally appropriate preschool programs and the nutrition, physical activity experiences, and health care needed to arrive at school with healthy minds and bodies and to maintain the mental alertness necessary to be prepared to learn (Haskins & Sawhill, 2009).

Are younger children in kindergarten at a disadvantage when acquiring important prereading skills? If younger children are disadvantaged, it may be appropriate to consider delaying their entry into kindergarten. This first year of school and introduction of the curriculum and achievement skills is a critical period in a child's academic development. The skills learned in kindergarten help establish a framework for a child's social and academic trajectory. Phonological awareness and letter-sound correspondence skills are prerequisites for the reading process, and both are introduced in kindergarten. Research with kindergarten children has shown that the phonological awareness skills learned during this year significantly predict future reading achievement (Torgesen, 1997). The following review of literature examines the components related to the advantages and disadvantages of delaying entry into kindergarten. These sections include: Redshirting, Delayed Entry of Kindergarten, Historical Perspectives, Kindergarten Enrollment, Domains Central to Reading Instruction, and Accountability.

### *Historical Perspective*

The first compulsory education law in the American colonies was established in Massachusetts in 1647 (Beatty, 1995). The Massachusetts General Court passed a law requiring every town to create and operate a grammar school. This was the beginning of our American school system, but the idea of kindergarten came much later. The first kindergarten opened in Blankenburg, Germany, in 1837. Friedrich Froebel (1782–1852), an educator and reformer, designed a program to offer preschool education to young children in a less formal environment based on the inherent goodness of children. His plan was to offer an organized setting in which children's creativity and play instincts were nurtured in a constructive and supervised manner. Children could be taught to

become better, more cooperative learners through the use of tools like songs, stories, games, and group activities. During the 1830s and 1840s Froebel made a case for the importance of music, nature study, stories, and play as well as symbolic ideas like children sitting together in the kindergarten circle. He advocated the use of "gifts" (or materials, largely geometric) and "occupations" (or crafts), which the teacher taught the children to manipulate (Beatty, 1995). He fashioned a personal philosophy of unity that embraced the spiritual potential within a person; the relations between people in a free society; the place of an individual in relation to the nature; and the life force that controls growth in all things. Thus, were born the three main ideas of Froebel's education philosophy: unity of creation, respect for the individual child, and the importance of play in children's education. The central idea of his theory was that a good education starts with learning creative expression and social cooperation (Beatty, 1995). In 1856 Margarethe Schurz in Watertown, Wisconsin founded the first kindergarten in America (Shapiro, 1983). Her German-language kindergarten impressed Elizabeth Peabody, who opened the first English-language kindergarten in Boston in 1860. The National Education Association began a kindergarten department in 1874, and teachers founded the International Kindergarten Union in 1892. By the end of the 19th century kindergarten had become a standard part of the American educational philosophy.

### *Kindergarten Enrollment*

Kindergarten enrollments in the United States fell from 1930 to 1940, as many school districts cut back their funding (though other school districts simultaneously adopted the kindergarten). Public kindergarten enrollments then grew almost 150 % from 1940 to almost 1.5 million children in 1954. Class sizes ranged from 20 to 49 students,

and some states passed laws to lower the enrollment (to 24 per class in New Jersey, for example). Kindergartens also increased the age requirement of the kindergarten, accepting children whose fifth birthdays fell on or before November (Wollons, 2000). In 1965 between about 50% and 85% of 5-year-olds attended kindergarten, more than 2 million of them in public schools in over 40 states, most of which made state funds available for that purpose. The HEAD START program begun in 1965 both served as a substitute for kindergarten for some 5-year-olds and helped promote further kindergarten establishment. By the 1980s kindergartens in the United States had moved away from child-centered education to academic preparation for first grade, and between 82% and 95% of 5-year-olds attended kindergarten (Wollons, 2000). In 1986 Mississippi became the last state to offer public kindergartens. As of the 1980s ten states required children to attend kindergarten, and most states required teacher certification in elementary education, fewer in kindergarten or early childhood education.

More than 150 years have passed since Horace Mann helped Massachusetts establish a statewide system of education that eventually led to the requirement that all children attend public school. In 1852 Massachusetts became the first state to pass compulsory school attendance laws, and by 1918 all states required children to receive an education. Today every state and territory requires children to enroll in public or private education or to be homeschooled. According to the U.S. Census Bureau the number of students enrolled in the nation's elementary through high schools (grades K-12) is 56 million. Fifty-three percent of 3 and 4 year olds attend school, and 72% of 3, 4, 5, and 6 year olds attend kindergarten all day. With so many children enrolled in our public

kindergarten classrooms, how do educators determine when a child is ready to begin school?

According to Miller (2005) a half-day kindergarten program was one where children attended 2 ½ to 3 hours per day. Miller posits that the trend from half-day programs to full day programs (6 hours per day) began in the mid 1990s. By 1998, 55% of kindergarten students were enrolled in a full-day program and 45% were enrolled in a half-day program. Parents were attracted to a full-day program because it reduced the number of transitions a child made in a day as well as for the social and academic benefits.

### *Redshirting*

The appropriate age for students to begin school is an issue for debate among administrators, teachers, and parents. Administrators and teachers worry that students will not be able to meet the rigorous academic standards associated with school accountability, while parents worry that their kindergarten children may not be able to compete with their older classmates. The National Center for Education Statistics in a Report of the Early Childhood Longitudinal Study (West, Denton, & Germino-Hausken, 2000) found that older kindergarten children outperform younger children in reading. Many of these families find themselves questioning whether their child is ready for kindergarten even though they are legally eligible to enroll. These families may use research or seek the advice of the preschool or kindergarten teacher concerning their child's readiness. "Researchers who support keeping younger, less prepared children out of school until they are older argue that children held back demonstrate higher levels of academic achievement or are socially and emotionally better adjusted than their younger

classmates” (Rabinowitz, 1989; Spitzer, Cupp, & Parke, 1995). The results of the study of McNamara, Scissons, and Simonot (2007) suggested that redshirting children in kindergarten may not have a positive effect on their phonological awareness skills, but may have some effect on their letter-sound understanding. One family asks whether their child is mature enough to begin kindergarten while another family may consider keeping their child out of school an extra year because they want their child to have an extra advantage or maintain a competitive edge (Noel & Newman, 2003). This practice has been labeled *redshirting*.

The term redshirting refers to the practice of keeping students off a varsity athletic team on the assumption that in the following year their more mature bodies and skills will enable them to be better athletes (Brent, May, & Kundert, 1996; Frey, 2005; Graue & DiPerna, 2000; Kundert, May, & Brent, 1995; Marshall 2003). A key difference is that redshirted athletes participate in practice and training, while redshirted kindergartners may receive no school services unless a preschool class is available. Children who are held out of school and retained in preschool an extra year before entering kindergarten are considered to be academically redshirted due to these children being given an extra year in order to give additional time for socio-emotional, intellectual, or physical growth (Brent et al., 1996; Cameron & Wilson, 1990; Frey, 2005; Gredler, 1978; Gredler, 1992; Shepard & Smith, 1989). Many of these children may have disabilities and may lose the advantages that come with early intervention and special education services (Denham, Hatfield, Smethurst, Tan, & Tribe, 2006; Parker & Ciechalski, 1990; Smolkowski et al.). Retention in any form is associated with countless negative outcomes for children of all ages but is particularly problematic for those who are academically redshirted (Beebe-

Frankenberger, Bocian, MacMillan, & Gresham, 2004; Bellisimo, Sacks, & Mergendollar, 1995; Brent et al., 1996; Cameron & Wilson, 1990; Crosser, 1991; Crosser, 1998; Dennebaum & Kulberg, 1994; Ferguson et al., 1997; Kinard & Reinherz, 1986; May & Kundert, 1995; McArthur & Bianchi, 1993; Roderick, 1995). Early intervention is a positive step towards improving academic and social aspects of a child who needs special education services, but redshirting may postpone the diagnosis and treatment of children who have a disability (Vellutino, Scanlon, Small, & Fanuele, 2006).

Despite the practice of redshirting this group of students, there is ample confirmation in the literature that children, particularly those with disabilities, do not benefit from any form of grade retention or redshirting (Berkey, 1994; Dennebaum & Kulberg, 1994; Ferguson, Jimerson, & Dalton, 2001; Frey, 2005; Graue & DiPerna, 2000; Jimmerson, 1999; McLeskey & Grizzle, 1992; May & Kundert, 1995; Weitzman & Auinger, 1997). Children who are retained in a grade or redshirted are also more likely to suffer long-term academic and emotional negative consequences, and being overage for a grade is strongly associated with increase school dropout during adolescence (Jimerson, 1999; Jimerson, Egeland, & Teo, 1999; Meisels, 1992; Roderick, 1994, 1995). Jimmerson describes the results of a 21-year study that found retained children were more likely to have poorer academic outcomes in all areas than those students who were not retained, and these retained students were less likely to continue their education post-high school (Jimerson, 1999). The position of the National Association of Early Childhood Specialists in State Departments of Education (NAECS/SDE) that is also endorsed by the National Association of the Education of Young Children (NAEYC) states, “Not only is there a preponderance of evidence that there is no academic benefit

from retention in its many forms, but there also appear to be threats to the social-emotional development of the child subjected to such practices.” (NAECS/SDE, 2000, p. 4)

The National Center for Educational Statistics (2006) showed that in 2004, 11.7% of children K-12 were retained at some point in their academic career. There is no government or district data comprised that estimates the percentage of students who are redshirted, but several studies have been presented that found the use of redshirting to be as high as 30% of all students and steadily increasing (Brent et al., 1996; Elson, Donley, & Towle, 1998; Graue, 1993). There is a substantial body of research documenting the negative effects of being older for a grade, yet delayed entry into kindergarten is widespread in America. It is estimated that there was an increase of 11% in 1971 and 18.7% in 1993 in 6 to 8 year old students who were older than their peers in a grade (Byrd, Weitzman, & Auinger, 1997). Twenty-six percent of 7 to 17 year olds in the US were older than their peers in a grade, and 54% of these children were redshirted or repeated a grade. Research has also found a positive correlation between being older for a grade and achievement and behavioral problems especially in the adolescent years (Byrd et al., 1997; Byrd, Weitzman, & Doniger, 1996; Byrnes, 1989; Jimerson, 1999; Rabinowitz, 1989; Resnick, 1997). Despite the limited research on academic redshirting, the majority of research on retention in general indicates that young children derive no academic benefit from being older in a given grade for any reason (Jimerson, 2001; Mantzicopoulos, 1997).

Advocates of redshirting say that children reach specific states of development based on an internal biological clock and there is little that can be done by schools or

parents to accelerate this maturation process (Katz, 2000). They found as children mature they begin to advance socially. Contrary to this belief, “children whose entry into school has been delayed do not seem to gain an advantage socially” (Marshall, 2003, p. 89). In fact more drawbacks than advantages are evident. Many children who have been redshirted worry that they have failed or been held back (Graue, 1993) and often have poor attitudes toward school (Graue & DiPerna 2000; Shepard & Smith 1989). Furthermore, students who are too old for a grade are less likely to graduate from high school. However, according to Meisels (1992), "It is possible that middle- to upper income students who have been held out will form a subgroup of overage students who will not be at risk for dropping out in the same way as other students, but this is yet to be demonstrated" (p. 90). Students who start kindergarten too young will have an academic disadvantage because they are developmentally unready for kindergarten curricula (Elkind, 1987).

When analyzing teachers' decisions to retain a child, researchers have found that the issue of whether the child was young for the grade is one of the most frequently identified reasons, both as a justification or explanation for the child's poor functioning and as a factor to consider when evaluating whether the child will fit into the cohort of children the subsequent year (Shepard & Smith, 1986). Torgesen (1997) and Stipek (2002) found that younger students who were redshirted were unmotivated, underachieving, and anxious throughout elementary and secondary school as a response to negative experiences in kindergarten. These disadvantages resulted in early grade retention for these young students.

The U.S. Early Childhood Longitudinal Study Kindergarten cohort (ECLS-K), collected from fall 1998 to spring 2000 and released by the US National Center for Education Statistics (NCES) reported that kindergarten teachers identify age as a factor that figures prominently in definitions and beliefs about readiness for kindergarten, and age is often used as a post hoc explanation for decisions to retain children in kindergarten. Research shows that grade retention has consistently negative effects for students in terms of attitudes about school, self-esteem, and increased probability of dropping out (Hauser, 2000). Therefore, redshirting could be a potential strategy for giving students an extra year to mature before school without risking the negative effects of grade retention. School districts consider increasing the maturity level of kindergarten classrooms either by recommending redshirting to parents or by increasing the minimum age for kindergarten. Redshirting could also be a relatively simple strategy to improve achievement in early grades due to increasing the average age of kindergartners (Stipek, 2002). Stipek's research has shown that the differences between kindergarten students are strongly tied to age. This entry-age achievement gap has been found to persist until as late as the eighth or ninth grade (& Dhuey, 2006). Bedard and Dhuey's study identified three broad interpretations of this achievement gap, with the first in regard to age. This refers to older kindergartners stand to gain over the long-term because they are bigger and smarter in relation to their classmates. The second interpretation is age of entry. Here older school entrants are believed to outperform younger school entrants because they are better equipped to succeed in school. These delayed entry students have been given another year at home for academic and social maturity. The third interpretation, age of test, is that age at school entry has no impact on achievement per se

but is correlated with cognitive development and the amount of skills that a child has accumulated outside of school. These children have lived longer; therefore, they have experienced more.

Teachers and classmates treated older children as being less capable than younger students in the same classroom. Many believe that maturity and school readiness can be influenced by school experiences. With this approach immaturity is the result of environmental or genetic factors that cannot be cured by an additional year of growth. Instead schools should provide developmentally appropriate instruction for young children with diverse backgrounds and experiences (Meisels, 1992). If young children benefit from a stimulating school environment, it could be hypothesized that children who start school younger actually gain a valuable head start in cognitive development and this head start could have lifelong benefits (Mayer & Knutson, 1999). Children who start school later may miss out on beneficial early childhood experiences and services provided by schools (May & Kundert, 1997). Families concerned about their child's maturity and whether to enroll their child in kindergarten have often been advised to give the child another year to mature. These families need to consider that delaying kindergarten entry age often has negative effects and they may be depriving children of important opportunities for learning or *theft of opportunity* (Graue & DiPerna, 2000). In addition, older students may feel awkward about reaching puberty before their classmates (Katz, 2000). In high school older students may be more likely to drop out because compulsory attendance laws dictate a minimum age at which students can leave school (Angrist & Krueger, 1991).

Recent research findings suggest that age does explain the entry-age achievement gap. Bedard and Dhuey (2006) reported “Those who have spent time in a kindergarten classroom know that there are remarkable differences in children's skills. Research has shown that these skill differences are strongly tied to age, with students who enter kindergarten later in life doing better than younger entrants. Moreover, an ‘entry-age achievement gap’ has been found to persist until as late as the eighth or ninth grade”. (p. 271) Some researchers have found conflicting results. Cascio and Schanzenbach, 2007 reported that children assigned to classrooms where there is a large gap between their own age and the age of their peers perform worse on standardized tests than children of the same age assigned to classrooms where this age gap is smaller.

Consistent with this idea, another study shows that having older peers in one’s cohort increased the likelihood of being retained or diagnosed with a learning disability (Elder & Lubotsky, 2008). Students who enter kindergarten before turning 5-years-old struggle academically if placed in school too early. May and Kundert (1995) also found that children who were *redshirted* were more likely to receive special education services in later grades in significantly higher proportions than children who did not delay entering kindergarten. While the objective of redshirting was long-term academic success and high school completion, testing occurred as early as third grade to ensure children were on track with grade-level requirements (U.S. Department of Education, 2003). Using tests as an accountability tool can put pressure on schools and can lead to downward pressure on second grade, first grade, and even kindergarten to meet high academic standards and an unprecedented level of academic rigor for young children

(Crosser, 1998). To begin looking at the importance of readiness and kindergarten entry age, we must first look at the history of kindergarten and its intention.

### *Domains Central to Reading Instruction*

In 1997, according to Stahl (2004), the U.S. Congress commissioned the Secretary of Education and related agencies to create a National Reading Panel to mine the scientific research for findings that had the greatest potential for impacting early childhood teaching practices. The Panel, comprised of parents, teachers, administrators, researchers, policy makers, and other education and child development leaders, conducted a comprehensive evidenced-based review of research on how children learn to read.

The National Reading Panel reviewed more than 100,000 research studies conducted during the three decades since 1966 and 15,000 conducted prior to 1996. The major question to be answered by the panel was, “How do children learn to read?” The panel’s findings fell primarily under the headings of five domains that influenced reading success (Stahl, 2004). The five domains essential to the development of early reading were: phonological awareness, phonics, fluency, comprehension, and vocabulary. These domains are interrelated in terms of development, instruction, and assessment. It is recommended that these domains be taught through a “balanced” approach to include explicit instruction with frequent and regular monitoring in order to create a full picture of a student’s progress in reading. Good instruction should also include the teacher modeling the use of reading strategies. Such work has shown that for academically important skills like alphabet recognition, word decoding, and phonemic awareness, schooling effects are much greater than age effects (Morrison, Bachman, & Connor,

2005). The use of flexible strategies helped improve a student's development of reading, especially comprehension and vocabulary. Unfortunately, these elements of reading instruction are not always made part of a school's curriculum or instruction. Also, unclear guidelines leave many teachers to figure out for themselves what to teach, what order to teach it in, how to teach it, and to what level (Haycock, 2009). Many of the assessments used in our public schools are inappropriate when addressing the needs of some students. They are mismatched to children's ages, not designed to measure higher-order critical-thinking skills, too narrowly focused, and poorly administered (Education Week, 2010).

Assessment of early literacy should include evidence collected for all five domains of reading along with assessment of use of reading strategies and habits of reading in order to understand student learning. Many assessments such as DIBELS (Dynamic Indicators of Basic Early Literacy Skills) address assessment individually within the classroom and focus on the five domains of reading. When used properly assessment evidence from each of the five domains of reading should compliment the others in the following ways: provide related information using multiple assessment formats, provide differing levels of specificity (state, district, and classroom levels), provide varied applications of content knowledge and skills, provide information at different points in the student's progress, and help to support decisions for teaching and learning.

Contradictory reports regarding the National Reading Panel have been written to support a pattern of sloppy research and a continuing misrepresentation of findings. Garan (2001) used the data and findings from the National Reading Panel to establish

flaws in validity and reliability. Garan stated, "Rather than living up to the highly publicized claims of scientific accuracy, the report was riddled with errors." (p. 32) Garan also criticized the National Reading Panel's report by pointing out a lack of continuity between the reports filed by the panel and the actual data that were collected. She concluded, "A disturbing pattern of fundamental contradictions between the findings in the lengthy reports of the subgroups and the panel's reporting of its own findings in the separately packaged, widely distributed summary and publicity video". (p.32)

Readiness issues are clearly important, but the question remains: can readiness be determined by age alone? For many years readiness for school was conceptualized in terms of the maturation of cognitive, social, and physical abilities. The abilities were perceived as developing essentially on their own according to a child's own time clock without regard to stimulation from the outside environment (Marshall, 2003). This idea of development has been interpreted to mean that certain levels of maturity need to be reached before children can succeed in school. Maturationists argue that readiness will develop over time. They generally advise delaying school entry for some children especially those whose birthdays occur near the cutoff date for entry. Recent research suggests that in respect to cognitive-academic functioning, children who began school at a somewhat older age performed better at the beginning of school, evinced greater improvement over the course of their first years of schooling, and functioned at a more advanced level in third grade than children who began school at a somewhat younger age (National Institute of Child Health and Human Development, 2005).

An alternative conception of readiness derives from interactionist and constructivist views. The work of Jean Piaget is often mistakenly interpreted as

supporting the view that children must reach a certain level of development before they are ready to learn new strategies or skills. However, Piaget's view that development results from the interaction between a child and the physical and social world are frequently overlooked (Liben, 1987; Steiner & Meeham, 2000; Sternberg, 2003). This theory presented development as automatic and suggests that children are stimulated by children's interactions with the world around them and the people with whom they come in contact. Piaget said that children couldn't think "operationally" until about age 6 or 7 (Berger, 2003). Extending this view further, Vygotsky (1978) described how learning, development, and readiness for new learning often require guidance and instruction, not just the passage of time. In Vygotsky's view learning and often teaching precede development. According to this view the point is not that children need to be ready for school, but that schools need to be ready to guide, support, and instruct each child, regardless of the skills or knowledge a child brings. The National Association for the Education of Young Children (NAEYC) suggested that children need basic skills before they could proceed was a misconception and that learning does not occur according to a rigid sequence of skills (NAEYC, 1990). Age could be irrelevant, and research in countries with different age requirements for school entry shows that the oldest entrants in one country would be the youngest in another (Marchese, 1995; Shepard & Smith, 1986; Thomas, 2005). Yet, this could be a significant factor in low achieving reading scores, which has long-term consequences in terms of individual earning potential, global competitiveness, and general productivity.

At an individual level the median annual income of a high school dropout in 2007 was \$23,000, compared with \$48,000 for someone who obtained a bachelor's or

higher degree (Planty, 2009). Planty (2009) stated that compared to other nations around the world the United States performed poorly in reading achievement. Planty also stated that children in Russia, Hong Kong, Singapore, parts of Canada, and Hungary scored significantly higher in reading literacy on the 2006 reading assessments. The countries that outperform the United States in reading are growing. This educational achievement gap could lead to a productivity gap between our country and others. McKinsey & Company estimates that if students in the United States had met the educational achievement levels of higher-performing nations between 1983 and 1998, America's Gross Domestic Product in 2008 could have been \$1.3 trillion to \$2.3 trillion higher. These demographic realities make the reading gap too large a problem to ignore.

According to the United States Census Bureau there are 7.9 million low-income children from birth through age 8, one fifth of all kids in this age group, and if current trends hold true, 6.6 million of these children are at increased risk of failing to graduate high school or meet NAEP's proficient reading level by the end of third grade (United States Census Bureau, 2011). Analyses of data from the Organization for Economic Cooperation and Development (OECD) indicate that the United States will need 60% of its population to possess a postsecondary degree or credential by 2025 to remain globally competitive (Schott Foundation, 2008). To achieve the OECD goal for workers with postsecondary degrees, the United States will need to produce 16 million more graduates above the current rate of production; therefore, they must be reading on grade level and reading proficiently by the end of third grade. The National Center for Education Statistics (2007) concluded that no state in our country set its own reading proficiency standard for third graders at a level that met or exceeded NAEP's proficient standard. Only 16 states

set their proficiency standard at a level that met or exceeded NAEP's lower "basic" standards, and the remaining states set their proficiency standard at so low a level that it fell below the NAEP "basic" reading level (Bandeira de Mello, Blankenship, & McLaughlin, 2009). When this happens states consistently underreport the true depth and extent of the deficit in reading proficiency, thereby depriving parents, educators, communities, and policymakers of a powerful tool for advocating change and measuring progress. Students may appear to be proficient but lack the skills to actually read at the level required for them to learn efficiently.

### *Accountability*

According to Vecchiotti (2001) older children tend to show more advanced developmental skills than younger children. Changes in age of entry can have effects on the percentages of children who meet certain academic or skill standards and can boost a district's standing on standardized testing measures. As global competition continues optimal age to begin school and what issues contribute to further academic success are becoming more crucial. Over recent decades transformations in school policies and teaching practices have caused a profound impact on kindergarten education. One of the most important changes has been the escalation of academic content in the kindergarten curriculum (Cosden, Zimmer, & Tuss, 1993). As a result of this trend kindergarten education has the added responsibility of preparing students academically for the upper grades. With concerns of accountability, public school districts are facing greater pressure to value standardized testing of student performance above all else. With older, supposedly more mature children at each grade, administrators in districts where children enter at an older age hope for higher average achievement scores. However, a

more academically rigorous kindergarten curriculum encourages a larger number of families to postpone starting their children in school (Cosden et al., 1993). When families delay their children's school entry, these *redshirted* children require a more advanced curriculum; thereby, boosting the spiral upward. NAEYC (1992) formed the basis for the position that the only legally and ethically defensible criterion for determining school entry is whether the child has reached the legal chronological age of school entry.

School attendance ages are often controversial. The National Center of Education Statistics reports that 6% to 9% of kindergarten-aged children in the United States start a year late (Diamond, Reagan, & Bandyk, 2000) and 5% to 16% of the preschool population has had its kindergarten entry age delayed (Graue & DiPerna, 2000). However, those figures may be even higher. Bounds (2004) reported that according to the Census Bureau, 22% of first graders were 7 or older in October 2002, up from 13% in 1970. State cutoff dates for kindergarten vary, but most states require students to turn 5 between September and December of the year they enter kindergarten (Saluja, Scott-Little, & Clifford, 2000). Many early childhood experts argue that if policymakers establish early cutoff dates for kindergarten, they should also establish aggressive school readiness programs to ensure students' success. Others argue that because there has been an increased emphasis on early childhood development and school readiness, we should continue to challenge children at a younger age. Some experts assert that age may be an arbitrary indicator or measure of a child's ability to succeed in school and should not be used at all. Others point out that when a state considers legislation allowing younger children to enter kindergarten, policymakers must understand that there is likely to be a

large increase in the number of children entering kindergarten during the first year of the new policy, thereby straining already tight school district budgets and increasing the need for teachers. The age at which students were mandated to start school can also be controversial. To encourage more students to attend institutions of higher education and to decrease dropout rates, juvenile crime, and teen pregnancy some state legislatures have increased the school attendance requirement to age 17 or 18. With these multiple requirements, a question remains. Does the age that children start kindergarten matter?

While redshirting offers students the potential advantage of being the oldest in kindergarten, it is unclear if age at school entry affects long-term academic success, high school completion, and college enrollment. According to Stipek (2002) there are typically three different research strategies that have been used to examine the effects of age of entry to school on children's success in school. The first strategy has been to compare outcomes for children who delayed entry by a year with those children who entered school when they were eligible. The second approach has been to compare children in the same grade who have different birthdays. Finally, the third approach has been to compare children who are the same age but in different grades as well as children who are a year apart in age but in the same grade. If older students continue to perform well through high school and beyond, delayed kindergarten entry may be an effective way to improve educational outcomes across the board. Although numerous studies document short-term benefits of redshirting, few have examined long-term effects. Using the National Educational Longitudinal Survey (NELS) of 1988, the National Center for Education Statistics (2002) examined the long-term effects of age of kindergarten entry and the practice of redshirting on a group of students who entered kindergarten in the late

1970s and early 1980s. Regression analysis confirmed that young children are more likely to repeat early grades, which does have negative academic consequences; however, controlling for grade retention and interactions with age at entry, the results confirmed that younger students performed at least as well as older students throughout high school and college (National Center for Education Statistics, 2002). Past studies of age at school entry typically follow an age or grade cohort and compare younger and older students. Most studies focus solely on early elementary school or follow a grade cohort through fourth or sixth grade (Stipek, 2002). One group of studies found that age had no effect on achievement even in early primary grades (Graue & DiPerna, 2000), while other studies show small academic advantages for older students (Datar, 2006). These studies measured academic progress through cognitive tests and achievement tests and show older students have higher test scores during early elementary school. Some studies show that older students have an advantage that lasts through elementary school (Cameron & Wilson, 1990) but many show the academic gap between older and younger students fading by the time students leave elementary school (Crosser, 1991). A recent review of the literature on age at school entry concludes that any academic advantages for older students disappear by third grade (Stipek, 2002), while others state that the difference is still distinct for fifth and sixth graders especially for boys (Kurdek & Sinclair, 2001). Shepard and Smith (1986) found that although the oldest children in a class on average are more successful than their younger peers in the first few grades, these differences are of little practical significance and usually disappear by grade three. Another determined that older children performed slightly better academically in grade one, but these differences disappeared 4 years later (Bickel, Zigmond, & Staghorn, 1991) or younger

students were no different from their older classmates (Crone & Whitehurst, 1999).

Overall, this may suggest that the maturity advantage of older students in the early grades does not translate into a lasting academic advantage. However, it is surprising to know that starting school young does have modest advantages in terms of lifetime accumulation of human capital.

Recent studies have explored the influence of age at school entry on lifetime earnings using national datasets by using season of birth as an instrumental variable. Using census data Angrist and Krueger (1991) and Mayer and Knutson (1999) found that adults who started school at a younger age have higher wages later in life. This is attributed as a result to compulsory attendance laws that are designed so students can drop out of school when they reach a certain age. Students who start school younger are likely to gain more years of education before they can legally drop out, while students who start older are able to drop out sooner, resulting in lower average wages throughout life. Early entry may actually increase cognitive skills that translate into higher wages later in life; therefore, students with summer birthdates have higher average earnings than students with winter birthdates (Mayer & Knutson, 1999). Individuals who are older when they begin kindergarten on average end up with less schooling as adults because the oldest children in class reach the age at which unfortunately, they can legally leave school in a lower grade. Further, under the assumption of an unchanging retirement age, the loss of labor market experience among older school entrants might not only negatively impact lifetime earnings but also lower lifetime contributions to Social Security (Deming & Dynarski, 2008).

Because boys and girls mature at different rates, the National Educational Longitudinal Survey also compared if the effects of age at school entry differed by gender. Using the previous results testing using only boys and only girls was compared. These results confirmed the conclusion that there were no direct effects of age at school entry on long-term academic and social outcomes for boys or girls. Although they did find that young boys are more likely to repeat a grade than young girls thus, the negative effects of repeating a grade due to age at school entry are a greater concern for boys (National Center for Education Statistics, 2002). For kindergarten students academic areas such as reading, mathematics, and general knowledge can vary greatly. One study concluded that by spring, the academic differences between boys and girls narrow (Oshima & Domaleski, 2006). For elementary school children gender differences declined across five grades with a rapid decrease up to the third grade and a gradual or no decrease between third and fifth grades. Although redshirting is more common for boys, the academic gap is not always more pronounced for boys (Bent et al., 1996). Therefore, perhaps the differences of birth date can be a much larger factor regarding academic performance than gender differences in the early grades. For many of these studies there seemed to be no difference in the progress of students based on age or gender from fall to spring. This may suggest that age and gender are insufficient criterion for determining academic success or kindergarten entry age (Morrison, Griffith, & Alberts, 1997). Many families are under the impression that holding their child out of school for a year will be beneficial. There are arguments and research to support each view, but families, teachers, and administrators need to be aware of the challenges and potential negative effects of both.

## CHAPTER 3

### RESEARCH METHODOLOGY

This study addressed the issue of whether there is a significant difference in the mean reading level of third grade students at the end of the school year when a combination of kindergarten age and gender are considered. The study also focuses on the differences in the mean reading level between the genders. Finally, the purpose of this study was to identify significant differences in the mean reading level of third graders as a function of kindergarten entry age. Third grade was chosen because research shows that if children are not reading on grade level by this age, they are likely to always read below grade level and/or never graduate from high school. Explicit, differentiated, instruction is essential for students in the primary grades, but could entry age and gender also be factors? This chapter includes: The Research Design, Population, Data Collection, Data Analysis, and Research Questions.

A quantitative framework was used to examine the possible relationship between kindergarten entry age and third grade reading level. A quasi-experimental design was selected because the data already existed and collecting additional data was unnecessary.

#### *Research Questions and Hypotheses*

The following research questions and null hypotheses were considered during the study. The independent variables in each question were gender and kindergarten entry age. The dependent variable in each question was a student's score on the Oral Reading Fluency section of the Dynamic Indicators of Basic Early Literacy Skills at the end of third grade.

*Research Question #1*

Is there a significant difference in the mean reading level of third grade students at the end of the school year by the kindergarten entry age of students who entered school on or after the age of 4 but before 5 years old, those who entered after the age of 5 but before 6 years old, and those who entered kindergarten after turning 6 years old?

H<sub>0</sub>1: There is no significant difference in the mean reading level of third grade students at the end of the school year by kindergarten entry age.

*Research Question #2*

Is there a significant difference in the mean reading level of third grade students at the end of the school year by gender?

H<sub>0</sub>2: There is no significant difference in the reading level of third grade students at the end of the school year by gender.

*Research Question #3*

Is there a significant difference in the mean reading level of students in the third grade at the end of the school year as measured by the Oral Reading Fluency (ORF) portion of the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) as a function of a combination of kindergarten entry age and gender?

H<sub>0</sub>3: There is a significant difference in the mean reading level of students in the third grade at the end of the school year as measured by the Oral Reading Fluency (ORF) portion of the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) as a function of the combination of kindergarten entry age and gender.

### *Population*

The population was comprised of students who were enrolled in third grade beginning with the 2003 school year and ending with students enrolled in the third grade during the 2009 school year in 11 elementary schools in an urban East Tennessee school system. The number of students enrolled in third grade during the time of the study was 1,697. One thousand three hundred eighty-four of the students were assessed with DIBELS at the end of third grade during the 2003 through 2009 school years to measure their reading levels.

### *Data Collection*

I collected data on the reading levels of third grade students in an East Tennessee school district using Pearson Power School and assessment spreadsheets gathered from the district reading specialist. These spreadsheets were completed annually by all teachers and submitted to the local education agency for archiving. This research required several pieces of critical information that included date of birth, gender, and the reading level of third grade students at the end of the school year for the past 5 years. Date of birth and gender were obtained from a report generated from the Pearson Power School. Reading level was gathered from the assessment spreadsheets. For access to the previous 5 years of assessment documents, assistance from the district reading specialist and the assistant director of schools was given. These documents were required for all system teachers to complete and included student name, school, teacher, school calendar date, assessment scores, and reading level. Dynamic Indicators of Basic Early Literacy Skills (DIBELS) assessment was the evaluative instrument used by the county. The county selected DIBELS because it is valid and reliable. This instrument addressed

assessment individually, within the classroom and focused on the five domains of reading (phonemic awareness, phonics, fluency, comprehension, and vocabulary) at the beginning, middle, and end of the academic year. The majority of the schools used the Fountas and Pinnell (2008) reading level method to acquire student-reading levels beginning in kindergarten through the fifth grade. Fountas and Pinnell are highly respected educators, researchers, and literacy experts who have used their studies and expertise to assist teachers across the United States with the reading levels of children. For those system schools that use supplementary reading level assessments, a resource provided by the International Reading Association (IRA) was used to convert system wide reading levels into one means for research purposes.

The research did not contain any information that might allow someone to align a student to a particular school or teacher. Names were not included in the study. Student names were matched with DIBEL scores. Then for purposes of the data analysis students were assigned a numerical code and documents containing names were destroyed. Finally, there were ethical considerations with regard to individuals with access to the research. By protecting the identity and location of the research subjects, the study met ethical standards and shield individuals from any consequences resulting from the conclusions of the study.

#### *Data Analysis*

An Analysis of Variance (ANOVA) provided a statistical measure for finding significant differences in the means of the population (Green & Salkind, 2008). The population in this study was students who entered kindergarten on or after the age of 4 but before the age of 5, on or after the age of 5 but before 6, and on or after 6 years old.

The statistical analyses were run to see if the difference between the scores on the Dynamic Indicators of Basic Early Literacy Skills for Oral Reading Fluency and Retell Fluency for the two groups was significant. Good and Kaminski (2003) stated, "Oral Reading Fluency is a standardized, individually administered test of accuracy and fluency with connected text. Retell Fluency is intended to provide a comprehension check for Oral reading Fluency." (p. 42) The data were entered into the SPSS program (Green & Salkind, 2008). The program was used to run a two-way analysis of variance (ANOVA) and provided a statistical analysis of the differences in the mean Oral Reading Fluency scores for students who entered kindergarten on or after their 4th birthday but before their 5th birthday, on or after their 5th birthday but before their 6th birthday, and those students who entered on or after their 6th birthday. The analysis was also used to identify any differences between the genders as well as a combination of entry age and gender. According to Green and Salkind the ANOVA was an appropriate analysis for a quantitative dependent variable and nominal independent variables. The independent variables included in this study were kindergarten entry age and gender. The dependent variables were the scores (Oral Reading Fluency) on the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) for third grade. The birthday and gender data were collected from permanent records housed in the individual schools within the target county. The DIBELS data were collected from spreadsheets filed by each individual school with the local education agency.

## CHAPTER 4

### ANALYSIS OF DATA

Chapter 4 describes the results of the analysis of the research questions identified in Chapters 1 and 3. This study was conducted to determine if a significant difference exists between the means scores of the Oral Reading Fluency (ORF) portion of the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) for students at the end of third grade in one east Tennessee school system. Specifically, the purpose of the study was to gather evidence of a significant difference in DIBELS scores when factors including gender, kindergarten entry age, and a combination of both are considered. The dependent variable was the scores on the Oral Reading Fluency (ORF) portion of the Dynamic Indicators of Basic Early Literacy Skills (DIBELS). The independent variables were the age students entered kindergarten and gender (male or female). The entry ages included in the study were 4, 5, and 6 years of age inclusive. Kindergarten entry age data were collected from archived spreadsheets available from the department of education in the target county. The individual DIBELS ORF scores were all collected from the reading specialist for the participating school system. Chapter 4 is guided by the research questions and the related null hypotheses.

#### *Analysis of Research Questions*

The following research questions and null hypotheses were considered during the study. The independent variables were gender and kindergarten entry age. The dependent variable in each question was a student's score on the Oral Reading Fluency section of the Dynamic Indicators of Basic Early Literacy Skills at the end of third grade.

*Research Question #1*

Is there a significant difference in the mean reading level of third grade students at the end of the school year by the kindergarten entry age of students who entered school on or after the age of 4 but before 5 years old, those who entered after the age of 5 but before 6 years old, and those who entered kindergarten after turning 6 years old?

H<sub>0</sub>1: There is no significant difference in the mean reading level of third grade students at the end of the school year by kindergarten entry age.

*Research Question #2*

Is there a significant difference in the mean reading level of third grade students at the end of the school year by gender?

H<sub>0</sub>2: There is no significant difference in the reading level of third grade students at the end of the school year by gender.

*Research Question #3*

Is there a significant difference in the mean reading level of students in the third grade at the end of the school year as measured by the Oral Reading Fluency (ORF) portion of the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) as a function of a combination of kindergarten entry age and gender?

H<sub>0</sub>3: There is a significant difference in the mean reading level of students in the third grade at the end of the school year as measured by the Oral Reading Fluency (ORF) portion of the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) as a function of the combination of kindergarten entry age and gender.

### *Analysis of Data*

A two-way analysis of variance (ANOVA) was conducted to evaluate the relationship between Oral Reading Fluency scores and kindergarten entry age, gender (male and female), and a combination of both. The means and standard deviations for Oral Reading Fluency scores as a function of the factors are presented in Table 1. The ANOVA indicated no significant interaction between kindergarten entry age and gender,  $F(2, 1,384) = 1.26, p = .283, \text{partial } \eta^2 < .01$ , but significant main effects for kindergarten entry age,  $F(2, 1,384) = 4.72, p = .009, \text{partial } \eta^2 < .01$ . No significant main effects were found for gender,  $F(1, 1,384) = 3.71, p = .054, \text{partial } \eta^2 < .01$ .  $H_{01}$  was rejected.  $H_{02}$  was retained.  $H_{03}$  was retained.

Follow-up analyses consisted of all pairwise comparisons among the three entry age groups. The Tukey HSD procedure was used to control for Type I error across the pairwise comparisons. The results of this analysis indicate that students who entered kindergarten on or after their 5<sup>th</sup> birthday but before their 6<sup>th</sup> birthday (Mean = 106.69) scored significantly higher ( $p < .01$ ) than students who entered kindergarten on or after their 6<sup>th</sup> birthday (Mean = 100.57). While not significant, it is worth noting that those students who entered kindergarten at 4 years old scored slightly lower ( $p = .906$ ) than students who enrolled in kindergarten on or after their 5<sup>th</sup> birthday but before their 6<sup>th</sup> birthday (Mean = 106.69) but higher ( $p < .103$ ) than students who enrolled on or after their 6<sup>th</sup> birthday (Mean = 100.57). Figure 1 shows the distribution of third grade Oral Reading Fluency scores by kindergarten entry age. Figure 2 shows the distribution of third grade Oral Reading Fluency scores by gender. Figure 3 shows the distribution of

third grade Oral Reading Fluency scores as a function of kindergarten entry age and gender.

Table 1

*The Means and Standard Deviations for Oral Reading Fluency for Third Grade by Kindergarten Entry Age and Gender*

Gender	Entry Age	<i>M</i>	<i>SD</i>	<i>N</i>
Male	4	106.33	31.140.	104
	5	103.60	29.020	275
	6	97.99	33.967	345
	Total	101.32	31.892	724
Female	4	105.06	28.266	128
	5	109.74	30.991	279
	6	104.08	35.791	253
	Total	106.66	32.497	660
Total	4	105.63	29.530.	232
	5	106.69	30.159	554
	6	100.57	34.851	598
	Total	103.87	32.281	1,384

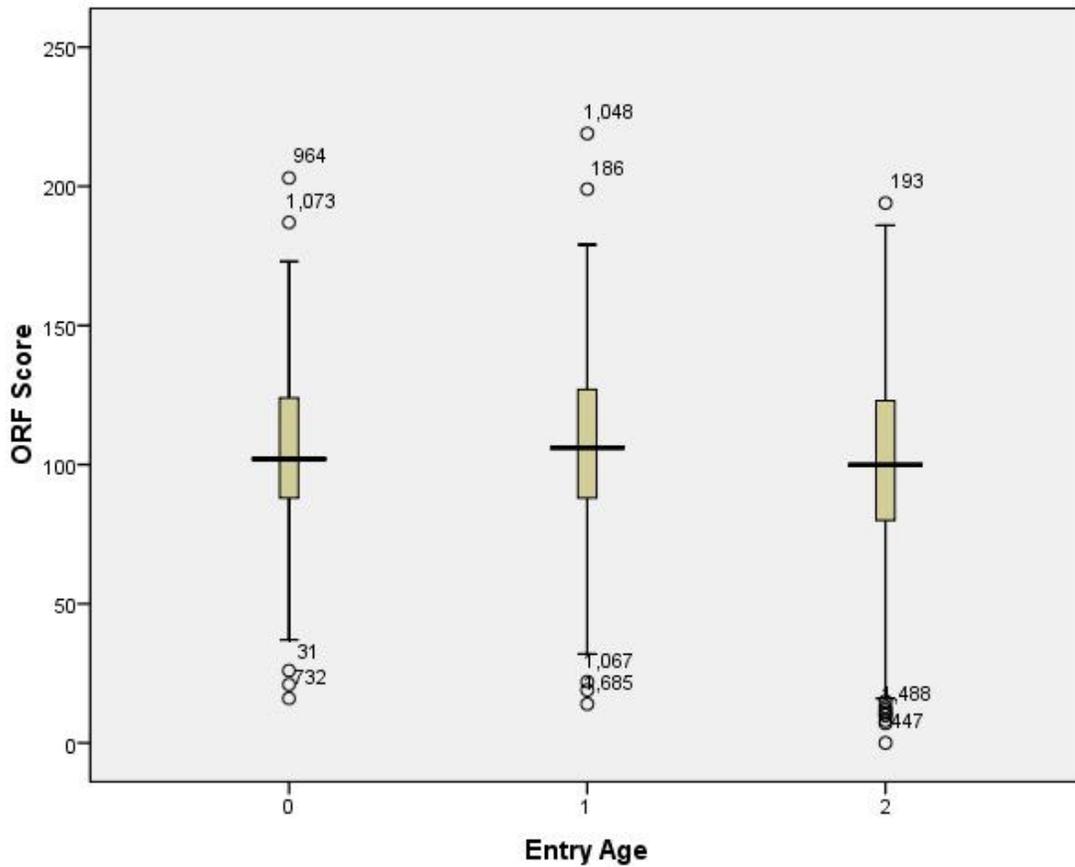


Figure 1. Boxplot for Oral Reading Fluency Scores by Kindergarten Entry Age

Notes: o = an observation between 1.5 to 3.0 the interquartile range

ORF = Oral Reading Fluency

0 = on or after turning 4 years old and before turning 5 years old

1 = on or after turning 5 years old and before turning 6 years old

2 = on or after turning 6 years old

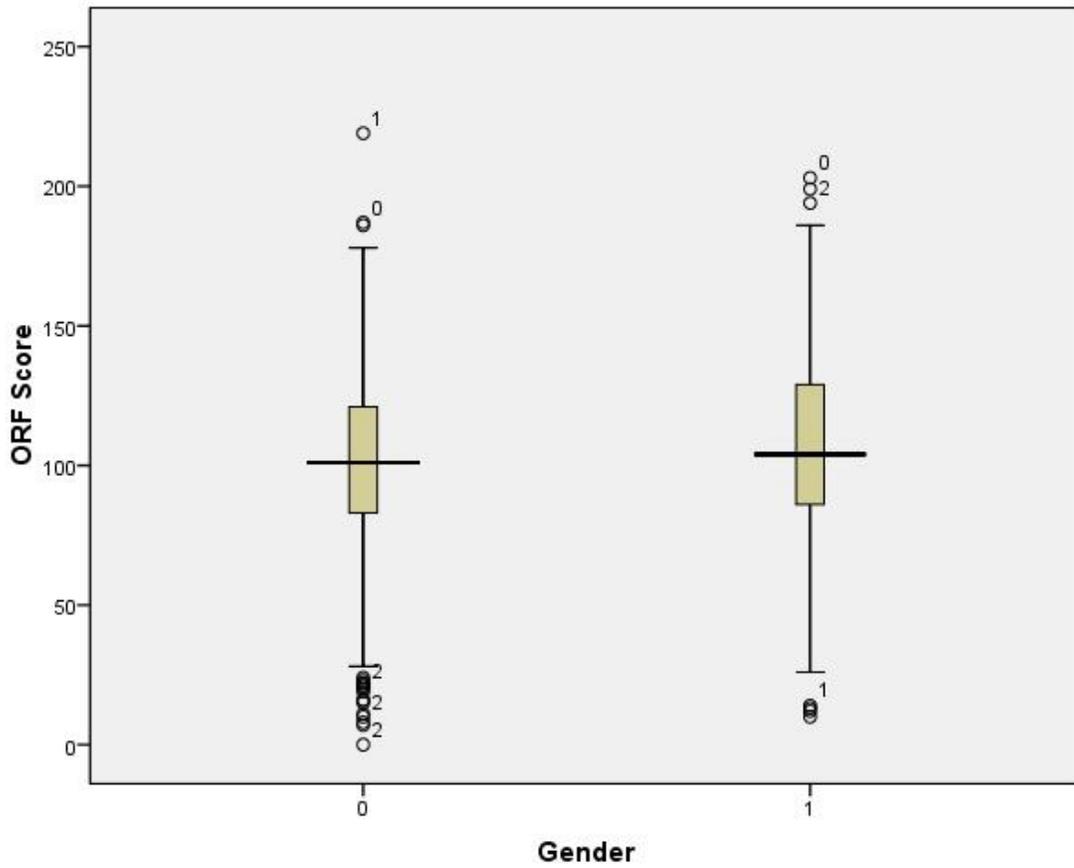


Figure 2. Boxplot for Oral Reading Fluency Scores by Gender

Notes: o = an observation between 1.5 to 3.0 the interquartile range

ORF = Oral Reading Fluency

0 = male

1 = female

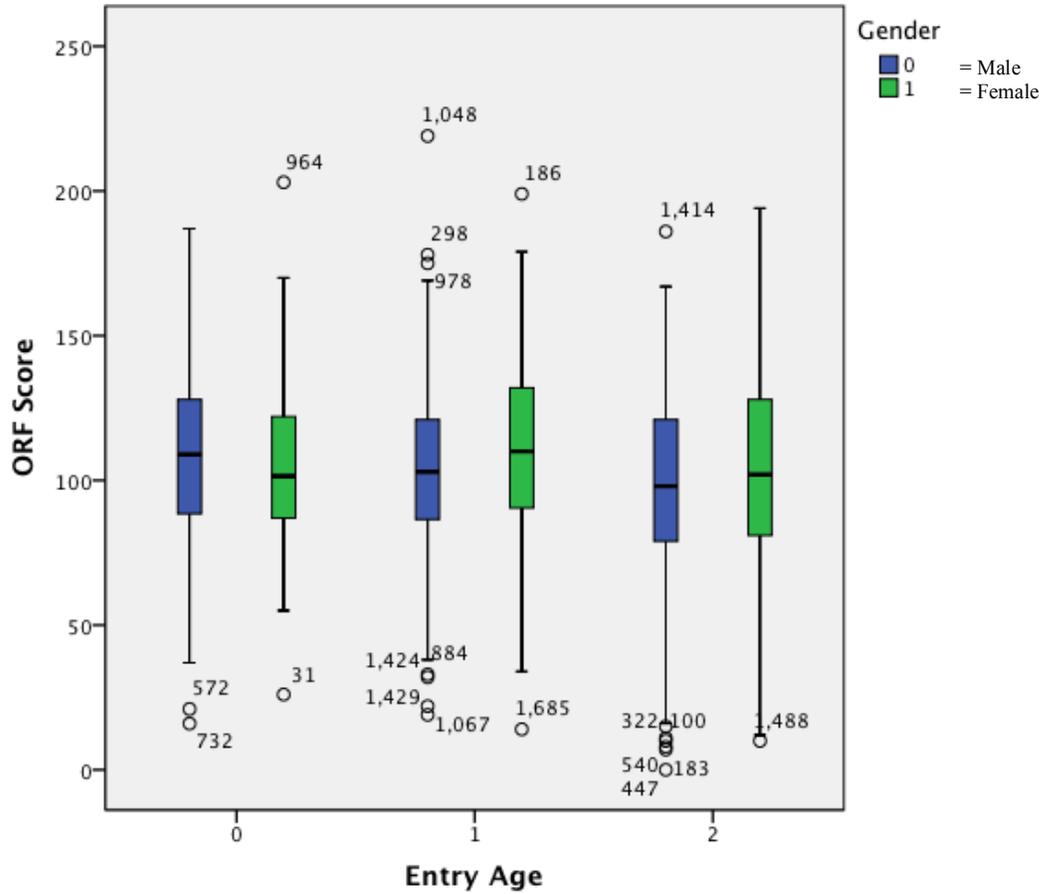


Figure 3. Boxplot for Oral Reading Fluency Scores as a Combination of Kindergarten Entry Age and Gender

Notes: o = an observation between 1.5 to 3.0 the interquartile range

0 = On or after 4 years old but before 5 years old

1 = On or after 5 years old but before 6 years old

2 = On or after 6 years old

## CHAPTER 5

### SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

This study found significant difference in the means of the Dynamic Indicators of Basic Literacy Skills (DIBELS) Oral Reading Fluency (ORF) scores for students who entered kindergarten on or after turning 5-years-old but before their 6<sup>th</sup> birthday and those that entered kindergarten on or after their 6<sup>th</sup> birthday. No differences were found between males and females of any entry age. The dependent variable was the scores on the Oral Reading Fluency (ORF) portion of the Dynamic Indicators of Basic Literacy Skills (DIBELS) instrument. The independent variables were kindergarten entry age (before 5 years old, on or after 5 years old but before 6 years old, and on or after turning 6 years old) and gender (male or female).

#### *Summary of Findings*

The statistical analyses were guided by the research questions in Chapter 1 and expanded on in Chapter 3. The dependent variable for each analysis was the Oral Reading Fluency (ORF) score from the Dynamic Indicators of Basic Literacy Skills (DIBELS) assessment. The ORF scores for each student are archived at the Hamblen County Board of Education offices. The independent variables were kindergarten entry age (before 5 years old, on or after 5 years old but before 6 years old, and on or after turning 6 years old) and gender (male or female). Gender and age at entry were gathered for students at the end of third grade for the school years beginning 2003 and concluding with 2010. Gender and entry age were obtained from archival documents located at the Hamblen County Department of Education offices.

*Research Question 1, 2, and 3*

Research Question 1: Is there a significant difference in the mean reading level of third grade students at the end of the school year by the kindergarten entry age of students who entered school on or after the age of 4 but before 5 years old, those who entered after the age of 5 but before 6 years old, and those who entered kindergarten after turning 6 years old?

Research Question 2: Is there a significant difference in the mean reading level of third grade students at the end of the school year by gender?

Research Question 3: Is there a significant difference in the mean reading level of students in the third grade at the end of the school year as measured by the Oral Reading Fluency (ORF) portion of the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) as the function of a combination of kindergarten entry age and gender?

The scores for the Oral Reading Fluency measures for students at the end of their third grade year ranged from 28 to 176 words per minute. The DIBELS Administration and Scoring Guide (Moats, 2003) identified a score of 110 words as the end-of-year benchmark for Oral Reading Fluency. Students who read 110 words or more were considered by the authors to be at a low risk of having reading problems prior to the next administration of the instrument. The mean score for the Oral Reading Fluency was 103.87. Students in the population generally scored below the benchmark. The two-way ANOVA found no significant interactions between the means for Oral Reading Fluency and kindergarten entry age by gender. This is different from the findings of Fleischman (2007). The purpose of Fleischman's study was to examine the associations between age at school entry and academic performance in kindergarten through the fifth grade. The

study used the Early Childhood Longitudinal Study, Kindergarten Class of 1998-1999 dataset that included a nationally representative sample that was collected over a 6-year period and compiled by the National Center for Educational Statistics (NCES).

Even when controlling for the variables of gender, race, socioeconomic status, and disability, the analyses revealed that the youngest students did not perform as well in reading as their school entry peers through the fifth grade. A separate analysis indicated that the youngest students were also less likely than their school entry peers to be in expected grade (fifth) during the fifth grade collection.

The findings were also strengthened because the youngest students in the study were found to not be “at-risk” in other identified areas (gender, socioeconomic status, parents’ education level). Although the youngest group did not have the identified “at-risk” characteristics, they still performed less well than their school entry peers in reading.

With my study, a significant main effect was found for kindergarten entry age. Students who started kindergarten on or after the age of 5 but before 6 years read more words in 1 minute than students who started kindergarten on or after the age of 6 years. McNamara, Scissons, and Simonot (2004) found similar results. Their study provided important insights into the nature of both sound-letter understanding and phonological awareness in kindergarten-aged children. Earlier research had demonstrated that phonological awareness and sound-letter understanding were critical to early reading development (Snow et al., 1998). The study asked whether younger children in kindergarten were at a disadvantage in acquiring these skills. Results of the study suggest that younger children were no different from their older peers in their

phonological awareness skills. No significant between-group differences between age groups were found for phonological awareness. However, significant between-group differences did occur for sound-letter understanding. In general, these results give strength to the notion that younger children in kindergarten were comparable to older children in their phonological awareness skills. However, younger children were less skilled in their understanding of sound-letter relationships. In general, the findings of their study suggest that chronological age is associated with sound-letter identification, but not with phonological awareness. This indicates that younger children perform similarly to older children in their ability to manipulate phonemes. However, the result was different when looking at sound-letter understanding. Significant between-group differences did occur for sound-letter identification. This finding suggests that sound-letter identification may be a skill that is acquired largely through experience with sounds and their corresponding letter. Considering these results, they suggest being cautious when considering delaying younger children's entrance into kindergarten based on chronological age. According to Snow et al. the results of their study suggest that redshirting children in kindergarten may not have a positive effect on their phonological awareness skills and may have some effect on their letter-sound understanding. There were no significant differences for the Oral Reading Fluency scores among the students who entered kindergarten on or after their 4th birthday but before their 5th birthday and the other age groups. No significant main effects were found for Oral Reading Fluency scores and gender.

Kindergarten entry age appeared to make a difference in the reading ability of students at the end of 3rd grade for students who entered on or after their 5<sup>th</sup> birthday but

before their 6<sup>th</sup> birthday. In general, students in the population were not performing better than the benchmark regardless of kindergarten entry age or gender.

#### *Recommendations for Practice*

The results of this study suggest that kindergarten entry age did have an effect on the reading ability of students by the end of third grade. Schools should evaluate all students' reading progress frequently to ensure their needs are being met and any problems are remediated. The evidence in this study combined with that of other researchers may assist teachers, parents, and administrators in making selective decisions about when students should be admitted into kindergarten programs. The results of this study did not indicate that gender was a factor for predicting a student's reading ability at the end of third grade. However, there is a strong consensus that it is important to remember all students should be treated fairly according to their strengths and weaknesses found regardless of gender.

#### *Recommendations for Further Research*

Current trends in accountability for teachers and students require educators to identify problems early and intervene to increase the probability of academic success. More research needs to be conducted to determine the long-term effects of redshirting or sending students to school too early. These recommendations are proposed for adding to the existing research about student maturity and academic performance.

1. The study should be replicated using a larger population.
2. A comparison study of kindergarten entry age and academic performance should be completed with other local education agencies in the state, region, and nation.

3. This study should be replicated using other assessment data such as state achievement test scores or Discovery Assessment scores. The triangulation of data from different sources would either support or refute the results of this study.
4. This study should be replicated to include scores for other disciplines including mathematics, science, and social studies.
5. This study should be replicated using data from students in secondary education to investigate the long-term effects of kindergarten entry age.
6. This study should be replicated using special education data for the state, region, and nation.

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