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An Investigation of Differences in Reading Achievement of Students Who Attend Full-Day Kindergarten Versus Half-Day Kindergarten Using DIBELS NEXT

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AN INVESTIGATION OF DIFFERENCES IN READING ACHIEVEMENT OF STUDENTS WHO ATTEND FULL-DAY KINDERGARTEN VERSUS HALF-DAY KINDERGARTEN USING DIBELS NEXT.

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Abstract

Kindergarten policies at both the state and local levels differ significantly, including areas such as availability, length of day, entry assessments, quality of instruction, class size, funding, teacher preparation and licensure, and curriculum. Despite this, the nation's governors and education commissioners came together to approve the Common Core State Standards, a set of clear college-and career-ready standards for kindergarten through 12th grade in English Language Arts and Mathematics.

This research was designed to investigate the difference, if any, in the reading achievement of students who attended full-day kindergarten versus students who attended half-day programs. Data included results of the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) Next assessment. The participants were two independent cohorts of general education elementary school students in kindergarten. Students who attended the elementary school for half-day kindergarten during the 2012-2013 school year comprised Cohort 1 (n=111) in District A. Cohort 2 was represented by students who attended a different elementary school in District B for full-day kindergarten during the 2012-2013 school year (n=119). Pairwise comparisons were analyzed at three time points: BOY-MOY, MOY-EOY, and BOY-EOY (Beginning of year, middle of year, end of year) for all available data. Two different kinds of data required different kinds of analyses. First, score data were a continuous variable and were analyzed with ANCOVA. An analysis of covariance was employed to determine the effect of the independent variable on the average value of the dependent variable. Second, level data were originally presented as text data (nominal). The data were converted to an ordinal

variable and analyzed with logistic regression, which provided results that can be interpreted exactly the same as the ANCOVA results. A secondary analysis analyzing effect sizes was also calculated.

Overall findings from the data that were collected and analyzed revealed that, although participation in full-day kindergarten had higher mean scores than half-day programs in all but one comparison, only a few DIBELS Next measures showed significant gains for full-day over half-day. One measure showed very small significant gains for half-day rather than full-day. These findings were similar with the gender comparisons. The general pattern of full-day doing better than half-day with small insignificant differences across a large number of variables was seen for both males and females.

Dedication

I would like to dedicate this work to my mom, my wife, and my three children. Throughout my life my mom has displayed perseverance, a strong work ethic, and unconditional love to her family. Jody, your support and encouragement helped me to never give up. I appreciate the sacrifices you made parenting by yourself while I was at Seton Hall or at work on the weekends. I love you. Gracie, Lauren, and Andrew, it is my hope you value learning and continue to pursue your goals and dreams.

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I would also like to thank my other committee member, Dr. Christopher Tienken. As we considered the statistics, he helped me interpret the findings and improved the overall research design. In addition, I appreciated his offering key questions that required me to understand the results. Also, thank you, Dr. Gerard Babo, for taking the time to review and offer advisement on Chapter 4. His guidance and support through the statistical analysis solidified my work.

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CHAPTER I

INTRODUCTION

Kindergarten policies at both the state and local levels differ significantly, including areas such as availability, length of day, entry assessments, quality of instruction, class size, funding, teacher preparation and licensure, and curriculum. Some five-year-olds go to school while some five-year-olds do not. Some five-year-olds attend school for two hours, and some five-year-olds learn for six hours. Some states have gone so far as to mandate kindergarten content standards in all academic areas, while kindergarten remains to be a noncompulsory grade (Milligan, 2012). Recently, Pennsylvania's Supreme Court decided that children become of compulsory school age upon their enrollment in school, whether or not parents elect to begin the child's education in kindergarten (Young, 2014). Although Pennsylvania does not require kindergarten, parents who enroll their children in kindergarten in a public school district but then do not ensure they go to class, can be penalized for violating Pennsylvania's school attendance laws. This decision emphasizes positive momentum in addressing the importance of early childhood education.

Despite this, the national differences in kindergarten programming demonstrates that children are not receiving equitable early education opportunities (Workman, 2013). The nation's governors and education commissioners came together to approve the Common Core State Standards, a set of clear college-and career-ready standards for kindergarten through 12th grade in English Language Arts and Mathematics developed largely by Student Achievement Partners. Student Achievement Partners, a non-profit organization of educators and researchers, helped ensure the Standards were based on the best available evidence of what students need to know and be able to do in order to be

ready for their future. According to the Children's Defense Fund, the Common Core State Standards students are expected to meet upon exiting kindergarten are rigorous (2014). The disparity between kindergarten policies creates a learning gap because students in one school district might receive more than three times the learning and developmental opportunities than those in a neighboring district.

In addition to the differences regarding compulsory attendance for kindergarten, children do not enter school on an equal level. Risk factors for poor lifelong educational attainment appear even before children enter the formal educational system. The U.S. Department of Education (2000) identified a high prevalence of risk factors for poor educational outcomes. Forty-six percent of children had one or more of the following factors: a mother with less than a high school education, family use of food stamps or receipt of welfare, a single-parent household, and parents whose primary language is not English. The number of risk factors was strongly associated with measures of general knowledge, reading and math abilities, fine motor skills, and social behavior among kindergartners.

Differences among "arriving" children often determine the educational programs they encounter, how the programs are implemented, and how children's experiences in these programs influence their learning (Alexander & Entwisle, 1996). Failure to compensate for these gaps may lead to lifelong challenges and obstacles in the child's educational career and to subsequent difficulties in employment, income, and health (Community Preventative Services Task Force, 2014).

Children entering kindergarten with elementary math and reading skills are the most likely to do well in school later (Duncan, 2007). Using six longitudinal data sets of

close to 36,000 preschoolers, Duncan sought to estimate links between three school readiness elements (school-entry academics, attention, and social and emotional behaviors) with future reading and math achievement. Children's preschool cognitive abilities and sociodemographic characteristics were held constant to rule out their influences. From a meta-analysis of results, economist Duncan and 11 co-authors found that early math skills have the greatest predictive power, followed by reading and then attention skills. Surprisingly, difficulty getting along with classmates and aggressive and disruptive behaviors did not detract from later learning. This suggests the importance of investment in early intervention strategies rather than remediation. Many preschoolers begin their first year of formal schooling (usually kindergarten) with varying levels of emergent literacy skills (Adams, 1990). This highlights the need for targeted and explicit literacy intervention at the preschool level, before kindergarten (Callaghan & Madelaine, 2012). "The expansion of publicly-funded preschool education is currently the focus of a prominent debate" (Yoshikawa, Weiland, Brooks-Gunn, Burchinal, Espinosa, Gormley, Ludwig, Magnuson, Phillips, & Zaslow, 2014, p. 3). Presently, 42% of 4-year olds attend publicly funded preschool (28% attend public prekindergarten programs, 11% Head Start and 3% special education preschool programs). This group of early childhood experts reviewed evidence for four-year-olds on why early skills matters and the costs versus the benefits of preschool education.

The National Reading Panel (2000) reviewed more than 100,000 research studies on literacy instruction and reported that a scientifically based reading instruction program must be based on five key instructional principles: phonemic awareness, phonics, fluency, vocabulary, and reading comprehension. Successful readers must be proficient in

all of these areas, without exception. However, there is also general agreement that socioeconomic status has a powerful relationship with early reading (Snow, 1998). Students from high-SES backgrounds tend to benefit from a range of material and social resources that set them up for success in learning to read prior to school entry, whereas students from low-SES backgrounds tend to lack access to these resources. It has been documented that early identification is necessary to prevent long-term reading difficulties to help narrow the SES gap. Third grade appears to be a critical benchmark (Rose, 2012). Students not reading proficiently by the end of third grade are four times more likely than proficient readers to drop out of high school (Hernandez, 2011). This challenge has caused state and local leaders to confront difficult questions pertaining to retention practices.

Traditionally, girls have outperformed boys in reading and writing. Although this gap may be minimal in kindergarten, it grows as students continue their education. According to the 2004 National Reading Assessment, the gap between boys and girls, which was only slightly noticeable in fourth grade, left boys 14 points behind girls during their 12th grade year (Perie, 2005). On the 2008 National Reading Assessment, female students continued to have higher average reading scores than male students at all three ages. The gap between male and female fourth-graders was 7 points in 2008. By 12th grade, there was an 11-point gap between males and females. Recent inquiries into the underachievement of boys in reading have called into question whether they require different forms of reading instruction from girls. A number of reading programs and initiatives have been developed to address this issue, including programs based on increasing boys' motivation, improving behavior, and instructional time. With continued

emphasis on accountability and student performance, school districts are finding ways to address the gaps between males and females.

Kindergarten, meaning a "children's garden," is a critical transition year for children leaving early childhood programs or their homes. In defining kindergarten, some states measure the number of hours a child attends each day, while others look at the total number of hours a kindergartner attends during a year. In addition to time requirements, Kauerz (2005) found that since 1984, 14 states have raised the entrance age to ensure children are five or older before starting kindergarten, whereas no states have lowered the entrance age. The criteria for what kindergartners need to know have dramatically changed within recent years. Today, in addition to socialization, the focus on curricula is more rigorous. *Newsweek's* Peg Tyre reported that kindergarten is the new first grade and that "in the last decade, the earliest years of schooling have become less like a trip to Mister Rogers' Neighborhood and more like SAT prep" (2006, p. 36). Children spend a lot more time being taught and tested than they do learning through play and exploration. As Hatch (2010) illustrated, it is accountability "shove down." These practices violate long-established principles of child development and good teaching. The National Council for Teachers of Mathematics (NCTM) released a statement in support of the basic goals of The Common Core Math Standards as well as having specific concerns. NCTM pointed out a few serious placement issues about the learning progressions being overambitious (NCTM, 2010). However, NCTM did endorse the final Common Core State Standards for Mathematics. In a 2010 joint position statement on the Common Core, the National Association for the Education of Young Children (NAEYC) and the National Association of Early Childhood Specialists in the State

Departments of Education (NAECS-SDE) remind that developmentally appropriate practices must be considered (Main, 2011). The characteristics of early childhood are important, and a developmental continuum of standards, curriculum, and assessments would better support the transitions of young children from the early years into later schooling.

Ensuring that early primary students acquire reading foundational skills is important. Juel (1988) reported that by the end of first grade, students proficient in reading will have seen an average of 18,681 words of running text. In contrast, potentially struggling students will have seen only 9,975. It is no wonder that, given that they have only half as much practice as their more proficient peers, struggling readers lose ground in decoding, automaticity, fluency, and vocabulary growth. The problem is not that the children do not develop these skills; the problem is that the gap is too wide and they fall behind their classmates to a point where they are never able to catch up.

Statement of the Problem

Although kindergarten has mainly been delivered as a half-day program since the Great Depression, full-day kindergarten programs have grown considerably over the past three decades. As of 2007, all 50 states have enacted policies allowing school districts to offer full-day kindergarten to students. More recently, full-day kindergartens have gained popularity among non-poor parents and schools (DeCicca, 2007). Elicker (2000) stated three major reasons for the steady increase in full-day kindergarten programs: (a) the high demand for child-care services and expansion of early childhood education, (b) the increase of early childhood brain development research, and (c) the developmental appropriateness of the various types of kindergarten programs. According to the National

Center for Education Statistics (2014), 34 states mandate that school districts offer a half-day of kindergarten. However, children are not required to attend kindergarten in 35 states, meaning only 15 states and the District of Columbia mandate kindergarten attendance. Not all states and local school districts are making the investment children need in high-quality kindergarten. Currently, only 11 states (Alabama, Arkansas, Delaware, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, and West Virginia) and the District of Columbia require districts to provide free, full-day kindergarten by law. There are still five states that do not require kindergarten at all (Alaska, Idaho, New Jersey, New York, and Pennsylvania), leaving the decision to school districts.

Since 1977, the percentage of kindergartners enrolled in full day programs has nearly tripled, increasing from 28% to 76% between 1977 and 2012. Black kindergartners are much more likely than other kindergartners to be enrolled in full-day programs. In 2012, 87% of Black kindergartners were in full-day programs, compared with 68% of Asian or Pacific Islander, 74% of Hispanic, and 75% of White kindergartners. Eighty-five percent of American Indian kindergartners were enrolled in full-day kindergarten (Condition of Education, 2014).

In addition to difference by race, there is discrepancy in kindergarten programs by regions. Kindergartners in the South and Midwest are more likely than those in the West to be enrolled in a full-day program (83% and 80%, compared with 64%, respectively, in 2012). Kindergartners in the Northeast fall in the middle, at 71% in 2012. However, differences between regions have been narrowing (Condition of Education, 2014).

These trends and differences across our country illustrate unequal access to publicly

funded full-day and quality kindergarten programs (Kauerz, 2005). This means too many young children lose a critical opportunity to develop and strengthen the foundational skills necessary for success in school and lifelong learning. The Children's Defense Fund has taken a snapshot of the status of kindergarten in America in order to focus the national, state, and local dialogue on the missing steps of our public schools. A recent review of state support for full-day kindergarten revealed large between-state legislative differences in the funding allocated to school districts (Kauerz, 2005).

A preventative approach that some districts believe will level the academic field is to expand kindergarten programs from half- to full-day programs with anticipation that full-day programs can afford children the appropriate learning time needed to help master primary-grade reading and math skills. Supporters of full-day kindergarten (Pennsylvania Partnership for Children, 2003; WestEd, 2005) also believe this circumvents subsequent needs for remediation and grade retention and lessens special education placements. In addition to academic achievement, other benefits of full-day programming include increased school readiness, narrowing of the gender gap, improved student attendance, and better socialization skills (Walston & West, 2004).

However, there is evidence that questions the long-term effectiveness of full-day kindergarten versus its short-term effectiveness. Many states are implementing full-day kindergarten as a quick solution without support from normative data and without changes in curriculum and teaching methods (Milligan, 2012). Academic benefits of full-day kindergarten students dissipates in later years and subside soon after children leave kindergarten (Hare, Howard, & Prince, 2001). In the age of tight budgets, it is important for districts to determine the effectiveness of full day kindergarten.

Purpose of the Study

Although many often think of early intervention as targeting exclusively preschool children, full-day kindergarten is an early intervention program. Indeed, one of the enduring discussions about kindergarten is quantity versus quality. Will a full-day program improve reading achievement benchmarks in comparison to students in a half-day program? A full-day kindergarten program increases the number of teachers, staff development, materials, and classroom space, and many local school districts must absorb additional costs. Some feel that taxpayers should not be offsetting childcare costs. This is especially important in more affluent school districts where the majority of students attend organized and quality preschools.

My purpose for this study was to investigate the difference, if any, in the reading achievement of students who attend full-day kindergarten programs versus students who attend half-day programs. Data include results of the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) Next assessment. Two districts with similar free- and reduced-lunch percentages were used to conduct the study.

Research Questions

Three questions guided this study:

1. What differences, if any, exist, in early literacy levels as measured by four DIBELS Next reading measures: Letter-Naming Fluency (LNF), First Sound Fluency (FSF), Phoneme Segmentation Fluency (PSF), and Nonsense Word Fluency (NWF), along with total composite scores, for students receiving full-day kindergarten when compared to students receiving half-day kindergarten?

2. What differences, if any, exist in the early literacy levels as measured by four DIBELS Next reading measures, along with total composite scores, for girls enrolled in full-day kindergarten as compared to girls enrolled in half-day kindergarten?
3. What differences, if any, exist in the early literacy levels as measured by four DIBELS Next reading measures, along with total composite scores, for boys enrolled in full-day kindergarten as compared to boys enrolled in half-day kindergarten?

Significance of the Study

Empirical research continues to be mixed regarding the impact of full-day kindergarten. The shift in kindergarten preference has resulted in a greater demand for research on the effects of full-day kindergarten in comparison to other scheduling approaches. Public schools are actively debating whether to transition to a full-day program, whether it should be restricted to low-income and at-risk students, and most importantly, how to finance this charge. Fusaro (1997) cautioned that "before a school district decides to commit additional resources to [full-day kindergarten], it should have empirical evidence that children who attend [full-day kindergarten] manifest greater achievement than children who attend half-day kindergarten" (p. 270).

The Center for Evaluation and Education Policy (2004) conducted an exhaustive review of the national literature on achievement, grade retention, special education referrals, and social and behavioral effects. The research supported the effectiveness of full-day over half-day programs and found that disadvantaged students in full-day kindergarten experienced greater academic benefits. However, the magnitude of these

benefits were inconclusive, as many researchers reported both large and small effects, and some reported negligible effects. In addition, the validity of the research design is another concern. Full-day "effects" are generally examined using pre-test- or post-test-only measurement designs with non-representative student samples. In addition, there are few controls for the non-random assignments of students to specific kindergarten program conditions (Elicker, 2000). Critics also contend that additional research with diverse samples, better controls, repeated measures, and the use of appropriate analytic techniques is needed to further explain the manner and degree to which full-day kindergarten differentially benefits students (Zvoch, Reynolds, & Parker, 2008). In addition, most studies have been conducted in local settings, are dated, and used analysis methods that are inconsistent with the nature of the intervention. This topic has been subjected to considerable scrutiny and continues to be an important focus of early childhood education.

Already a discrepancy of preschool experiences exists among children prior to entrance into kindergarten. If the academic benchmarks become higher when entering kindergarten with full-day programs, students with limited preschool opportunities may fall even farther behind. In a Yale University study, Olsen and Zigler (1989) pointed out that the effects of full-day kindergarten tend to be restricted to students of lower socioeconomic status and have very little impact on middle-class children.

The National Center for Education Statistics (2010) reported that since the 2004–2005 school year, full-day kindergarten programs in Pennsylvania have increased. In the 2002–2003 school year, 38,427 children attended full-day kindergarten; this figure nearly doubled to 63,404 by the 2005–2006 school year. In 2009–2010, the Pennsylvania

Department of Education's enrollment file reported that about 125,000 children had entered kindergarten and almost 70% were enrolled in full-day programs.

As of 2012, 450 of 501 school districts in Pennsylvania offer full-day kindergarten, although it is still not required (Children's Defense Fund, 2012). This surge is a result of a Pennsylvania Department of Education grant opportunity supporting districts to either extend or expand full-day kindergarten programs. Eligibility was not based on the socioeconomic status of the district, but instead on the willingness to regard kindergarten as the social, emotional, and academic foundation for future learning and success in school. This Accountability Block Grant is responsible for either partly funding or fully funding nearly two out of three Pennsylvania students attending full-day kindergarten, which is approximately 50,000 students in Pennsylvania. Yet, just as associations between test data and later academic achievement were beginning to develop, the governor eliminated this grant in his 2011–2012 budget. In poor economic times, full-day kindergarten is often at risk. States and school districts have cut funding for full-day kindergarten in an effort to balance budgets. This study is significant for governors and state lawmakers who are charged with funding decisions and allocating funding streams for education initiatives.

The Parkland School District, located in Allentown, Pennsylvania, completed a six-year strategic plan required by the Pennsylvania Department of Education for 2008–2014. The district website utilized a needs assessment to survey community members, alumni, parents, staff, and students in order to develop future goals and a new vision. As a result of the needs assessment, Parkland School District will review and investigate the impact that extended-day kindergarten programs have on kindergarten student

achievement and success. More recently, Parkland School District developed an Early Childhood Literacy Committee. The goal of this committee is to review literature specifically about full-day kindergarten and its potential impact for the district, along with obtaining 100% literacy proficiency by the end of third grade. This committee will use the results and literature review from this study for program improvements and future policy and funding decisions in the local school district. As school districts carefully craft local budgets and pay attention to possible referenda, school administrations must continue to ask questions such as "Are we getting good value for our dollar?"

Limitations of the Study

A major limitation of this study is that it is non-experimental; therefore, cause and effect cannot be established. Non-experimental research is important and valuable in education; however, it contains limitations. Statements about observed relationships between variables can be made; however, cause cannot be expressed. Threats to internal and external validity occur at one or more of the three major stages of the study: research design/data collection, data analysis, and data interpretation (Onwuegbuzie, 2000). Internal threats to validity, as identified by Campbell and Stanley (1963), during the research design and data collection stages of this study include history, maturation, pretest sensitization, instrumentation, differential selection of participants, implementation bias, evaluation anxiety, multiple treatment interference, and time x treatment interaction.

Delimitations

The small sample size (n=230) for each of the groups created ecological validity concerns and restricted the ability to generalize results beyond the schools in this study.

Also, the proposed methodology had a small sample size and was limited geographically. The students were not randomly assigned to either full-day kindergarten or half-day kindergarten—the selected school districts determined this. Despite similar percentages of free- and reduced-price lunches at the selected schools, school districts had the ability to establish their own at-risk classification criteria. These students may have had multiple learning difficulties, been identified as learning support students, or classified as Title I. Title I provides federal money to school districts based on the number of low-income families in the district. Schools use these funds to pay for extra educational services for students who are behind in school. Additional differences such as socio-economic status, non-English speaking, and parent involvement among the students enrolled in both kindergarten program types may influence the results. Also, kindergarten eligibility is based on age, and therefore factors such as the amount and quality of preschool experience, students' abilities, and intelligence, were not controlled for. Another limitation was that for the purpose of the study, reading achievement was identified solely by the literacy universal screener DIBELS Next. Although DIBELS Next helps determine a primary-aged student's reading readiness, it should not be the only criteria to a student's reading achievement. DIBELS Next helps determine students who are "at risk," and the purpose of the test, according to the authors, is to predict student success on high-stakes reading achievement tests and to evaluate reading achievement (Good & Kaminsky, 2002).

This study also did not note differences, if any, in classroom structures, reading curricula, instructional methodologies, teacher salaries, and teacher experience. There may have been preexisting differences among the students of which the researcher was

unaware, such as the curriculum to which the students were exposed and the amount of time during the day allotted for literacy development. Also, teachers' perceptions of the advantages and disadvantages between full-day and half-day kindergarten were not included. The study focused solely on quantitative data obtained from the two school districts from one point of time, the 2012-2013 school year.

This study addressed only the length of the kindergarten school day on DIBELS Next scores and of itself limited the study. Generalizations should not be made for other grade levels based upon this research.

Definition of Terms

For the purpose of this study, the following definitions are provided for clarity and consistency.

Composite Score is a combination of multiple DIBELS Next scores and provides the best overall estimate of the student's early literacy skills and/or reading proficiency. Some students who score at or above the DIBELS Next Composite Score benchmark goal may still need additional support in one of the DIBELS Next measures, especially for students whose composite score is close to the cut point (DIBELS Next Assessment Manual, 2011, p. 135)

Dynamic Indicators of Basic Early Literacy Skills (DIBELS Next). According to the University of Oregon Center on Teaching and Learning, DIBELS Next are a set of standardized, individually administered measures of early literacy development. They are designed to be short fluency measures used to regularly monitor the development of pre-reading and early reading skill (DIBELS Next Assessment Manual, 2011, p. 2).

Full-day kindergarten describes kindergarten classes offered five days a week for five to six hours each day (Elicker, 2000).

Half-day kindergarten describes kindergarten classes offered five days a week for two and a half hours each day (Elicker, 2000).

First Sound Fluency (FSF) is a new DIBELS Next measure that helps determine a child's ability to recognize and produce the initial sound in an orally presented word. Using standardized directions, the assessor says a series of words one at a time to the student and asks the student to say the first sound in the word (DIBELS Next Assessment Manual, 2011, p. 39).

Letter Naming Fluency (LNF) is a DIBELS Next measure that assesses a child's ability to identify both lower-case and upper-case letters. Using standardized directions, the assessor presents a page of uppercase and lowercase letters arranged in random order and asks the student to name the letters (DIBELS Next Assessment Manual, 2011, p. 48).

Nonsense Word Fluency (NWF) is a DIBELS Next measure that assesses alphabetic principle skills. It assesses knowledge of basic letter-sound correspondences and the ability to blend letter sounds into consonant-vowel-consonant (CVC) and vowel-consonant (VC) words (DIBELS Next Assessment Manual, 2011, p. 66).

Phoneme Segmentation Fluency (PSF) is a DIBELS Next measure that identifies a child's ability to fluently segment three or four phoneme words into their individual phonemes. Using standardized directions, the assessor says a word and asks the student to say the sounds in the word (DIBELS Next Assessment Manual, 2011, p. 55).

Phonemic Awareness is hearing and using sounds in spoken words (Roberts, 2003).

Phonics refers to specific instruction in how the sounds of speech are represented by letters and spellings (Roberts, 2003).

Reading Achievement for this study focuses on the DIBELS Next results. There are three possible score levels: at or above benchmark, below benchmark, and well below benchmark. At or above benchmark means the odds are in the student's favor (approximately 80%-90%) of achieving subsequent early literacy goals. A below benchmark score level gives the students roughly 40–60% odds of achieving subsequent early literacy goals. The student typically needs strategic, targeted instructional support to ensure that he or she makes adequate progress and achieves reading benchmarks. A student who is identified as well below benchmark has approximately 10–20% odds of achieving subsequent early literacy goals (DIBELS Next Assessment Manual, 2011, p. 25).

Null Hypothesis

Null Hypothesis 1: No statistically significant relationship exists between length of kindergarten program and each of the four DIBELS Next reading measures, along with total composite scores.

Null Hypothesis 2: No statistically significant relationship exists between girls enrolled in full day kindergarten as compared to girls enrolled in half-day programs and each of the four DIBELS Next reading measures, along with total composite scores.

Null Hypothesis 3: No statistically significant relationship exists between boys enrolled in full-day kindergarten as compared to boys enrolled in half-day programs and each of the four DIBELS Next reading measures, along with total composite scores.

Independent Variable: Length of Kindergarten Program

The independent variable for this study was the length of the kindergarten program in two different school districts.

Dependent Variable: DIBELS Next

The dependent variable in this study was kindergarten student achievement on the DIBELS Next assessment during the 2012-2013 school year according to the description and administration timeline of the DIBELS Next Reading Measures. Scores were categorized as reported by the DIBELS Next Kindergarten Benchmark Goals and DIBELS Next Cut Points for Risk.

CHAPTER II

LITERATURE REVIEW

The purpose of this chapter is to present related research and literature on the historical background of kindergarten, the theoretical framework for this study, kindergarten trends and policy issues, full-day kindergarten benefits, limitations of full-day kindergarten, cognitive reading development between early childhood boys and girls, and the Dynamic Indicators of Basic Early Literacy Skills (DIBELS Next).

Historical Background

Kindergarten roots extend back to the nursery school movement in Europe. In Scotland, a socialist cotton-mill owner, Robert Owen, believed that the environment molds a person. He created a peaceful setting for the children of his workers. "By 1813, Owen had created an environment where children from birth through six years old played, sang, and ate regularly" (Shortridge, 2007, p. 2). Soon afterwards, numerous philanthropic organizations in Europe began organizing environments similar to Owen's. These "infant schools" spread to Germany and by 1830, *Kleinkinder-bewahranstalten* (public institutions for the care of the poor) were established.

Coinciding with Germany's infant schools but constituting a separate movement, Friedreich Froebel (1782–1852) originated the concept of kindergarten in 1837. He too believed that children should attend for play and was most interested in the years between ages 4 and 6. Froebel felt the goal was to strengthen their bodily powers, exercise their senses, employ their awakening minds, and guide their hearts and souls in the right direction (Morrow, Strickland, & Woo, 1998). In a natural environment, Froebel considered children to have a natural need to be expressive if left to their own devices.

This philosophy was the opposite of what felt young children could or should do. Froebel's kindergarten did not over-emphasize academics but rather focused on spiritual and character development. His kindergarten beliefs gained acceptance and spread across America, England, France, Italy, and Holland. His stated purpose was as follows:

> To take the oversight of children before they are ready for school life, to exert an influence over their whole being in correspondence with nature; to strengthen their bodily powers, to exercise their senses; to employ the awakening mind, to make them thoughtfully acquainted with the world of nature and of man; to guide their heart and soul in a right direction, and lead them to the origin of all life (Barnard, 1881, p. 91).

In 1856 Margaret Schurz established the first private kindergarten in America. She was trained by Froebel. This kindergarten was limited to five of her relatives and was conducted using the German language. It was the ignition of the organized kindergarten movement (Dombrowski, 2001). Although Schurz's first kindergarten was German, she also established English-language kindergartens. Another early proponent of kindergarten in America was Elizabeth Peabody, who founded the first English-speaking kindergarten in Boston in 1860. She too, used Froebel's methods and promoted kindergarten among leaders of the educational movement at large by writing articles such as "The Moral Culture of Infancy" and "What is Kindergarten?" Following Schurz's model, and not surprisingly, the transcendentalists of New England embraced Froebel's methods and the movement expanded.

Kindergartens were created mostly for poor urban children and children of immigrants in the 1870s. They were usually funded by charitable organizations. Around

the same time, the first publicly financed kindergarten in the United States was established in St. Louis. The first public kindergartens operated on a half-day schedule mainly because of the financial implications. During the late 1800s the kindergarten movement took a turn as a result of John Dewey's lab school from 1896 to 1903. Dewey reacted to Froebel's philosophy and believed that there was a middle ground between free play and formal instruction (Weber, 1984). Dewey felt that play should be centered in real activities performed at home, which philosophically aligned to Maria Montessori's work. Montessori theorized that if children were permitted to move about at their discretion, choosing what interested them, they would manifest self-discipline because of their deep interest in work. She felt that the teacher should decide what options are and are not available for the child. Fierce debates continued among kindergarten advocates about the standards of quality and content from the 1890s to the 1910s.

> Was the kindergarten to lay the foundation for literacy and numeracy by teaching the rudiments of the three Rs? Should it socialize children to the practices of the school, including sitting still, talking in turn, and obeying the teacher? Was it to help develop children's creativity, sense of cooperation, and self-confidence? Or could or should it do all of these? (Dombkowski, 2001, p. 530).

Regardless of these arguments, by 1912, 9% of American children of kindergarten age were in public school kindergartens, up from 5% in 1900 (Shortridge, 2007) and non-compulsory kindergarten was incorporated into most major urban schools by 1914.

Continuing the struggle to define its programmatic integrity, kindergarten faced two new challenges in the 1930s: the Great Depression and the laboratory nursery school. Public schools' Depression-era budgets ended the kindergarten's phenomenal 1920s

growth, with approximately 20% of U.S. cities reducing or cutting their kindergarten programs. Prior to the Great Depression, kindergarten was mainly whole-day; but World War II, the massive baby boomer influx, and the huge influx of European immigrants caused space issues which resulted in half-day programs. During the depths of the Great Depression, the federal government funded 1,500 nursery schools for children aged two to four, hoping that these nursery schools would be eventually supported by the local school districts. The majority of children attending kindergarten did not have prior pre-school experience. During the 50 years between 1936 and 1985, every state eventually transitioned to a model where kindergarten was subsidized through state revenues, allowing schools to count kindergartners as part of their enrollment for state aid purposes. Ohio was the first state in 1935 and Mississippi was the last state in 1985.

By mid-century and post-World War II, half-day kindergarten programs were still prevalent, as fewer kindergarten teachers were available (Cooper, Allen, Patall, & Dent, 2010). By the early 1960s, 90% of all kindergartens were half-day programs and 70% of school districts had kindergartens. Whole-day programs re-emerged in the late 1960s due mainly to the new academic push for college. In addition, full-day programs grew as a result of the Soviet launch of *Sputnik* and the growing concerns of the effects of poverty on children. By the 1980s, nearly 100% of U.S. children attended kindergarten before entering the first grade of primary school.

Current Kindergarten Trends and Policy Issues

Despite parents increasingly engaging their young children in cognitive activities over the second half of the 20th century, there remains a great deal of conversation regarding how to address the achievement gap that appears before the start of formal

schooling. For many, early childhood education is the answer. Some believe in a universal system available to all children, while others argue we should concentrate on the economically disadvantaged children or a targeted audience. Regardless, both will be difficult because of how this century's recession has disproportionately affected prekindergarten education. State funding for preschool programs was cut by almost $250 million in 2010 and that total could reach $338 million through 2011 (Epstein & Barnett, 2010). Preschool enrollment growth has slowed and per-child spending has decreased. As an example, Pennsylvania has decreased its early education budget by $30 million. Similar to art, music, and physical education, budget cuts threaten early childhood education because they are the least institutionalized of the public school years. In addition, there is a variation in early childhood and kindergarten program delivery because education is controlled by both state and local governments.

Today's full-day kindergartens have roots in economic and social changes. Whether both parents work or students come from single-parent families, family patterns influence school choice. An important factor driving the growth of full-day programs is the greater demand for choice in kindergarten programs. Some parents have expressed concern about the length of time that children are in school, but many are also content with the full-day option. Other reasons for implementing full-day kindergartens are a growing desire for quality care in educational environments and an interest in preparing for future academic success (Morrow, Strickland, & Woo, 1998). Contemporary kindergarten practices send mixed messages because, despite the increase in popularity, funding for kindergarten comes primarily from local initiatives and resources. One approach to offset local expenses when districts do not qualify for state aid is to charge

parents tuition on a sliding-fee scale. Ohio, Massachusetts, and Oregon currently employ this approach in order to offer full-day kindergartens. As Vecchiotti stated, "Kindergarten suffers from the middle-child syndrome, caught between early education and public education, even though it shares features with both educational levels" (2001, p. 16). This has been debated across the country as states have searched for ways to fund programs that traditionally have been treated differently from first through 12th grades.

Another recent trend in the states over the last 30 years is to establish a cutoff date earlier in the year to start kindergarten. Public schools typically allow children to enter kindergarten if they turn five during the autumn of the kindergarten year, but this cutoff date for turning age five varies from state to state and even between districts (Kagan & Kauerz, 2006). By 2010, 44 states had established a cutoff date, and 37 of those required that students must turn five by a certain date in September or earlier compared to 1975, when, of the 30 states that had a cutoff date, nine required students to have turned five by a certain date in September or earlier. According to the Education of the State report "Full-Day Kindergarten: A Study of State Policies in the United States" (Kauerz, 2005), lawmakers consider a number of assumptions when deciding to raise the entrance age for kindergarten:

- From a policy perspective . . . raising the kindergarten entrance age will increase student achievement because they [lawmakers] believe older children are better prepared for success.
- From a fiscal perspective, raising the kindergarten entrance age creates a one-time decrease in the education budget, as it reduces the number of children who enroll . . . when the age change takes effect.

- From a child's perspective, raising the kindergarten age means that some children essentially miss out on an entire year of learning.

Rather than trying to change the entrance age, some policymakers feel more effort should be spent on preparing schools and teachers to support all the children in kindergarten. Students have individualized learning styles, and whole-group instruction no longer works. Traditional teaching falls short when considering the individual needs of students. Similarly, parents have different preferences; and as a result of these needs, some contend that full-day kindergarten should not be mandatory.

Policy-impacting pedagogy and curricula have historically been debated but have been and remain at the heart of early childhood education and kindergarten. Early childhood standards state that student learning goals should guide the development of content and curricula. The content of kindergarten curricula needs to become more robust. Unlike children of even 10 years ago, today's kindergarten student is growing up in a digital age (Kagan & Kauerz, 2005). The traditional kindergarten classroom that most current adults remember has largely disappeared. The results of three studies supported by the Alliance of Childhood suggest that time for play in most kindergartens has vanished, replaced by lengthy lessons and standardized testing (Miller & Almon, 2009). Kindergartners are now under great pressure to meet academic standards that until recently were reserved for first grade.

The issue of bilingualism is another hot topic. The question is whether or not the ability to communicate in both English and another language will help prepare students to participate in the international community. Such learning standards not only become the backbone of curricula but are also linked to assessment. A natural link between curricula,

instruction, and assessment is necessary. Careful emphasis on blending content and pedagogy is receiving more attention from policymakers, administrators, and teachers. This will take time, talent, and training, along with commitment to developmentally appropriate practices.

Other than the curricula and pedagogy currently being examined, kindergarten teachers are being met with increasing demands, such as knowledge of child development, curriculum content, classroom management, and cultural diversity. To bridge this gap, many districts implement new teacher induction programs supported by mentor teachers. Districts are continuing to update teacher-preparation programs so they are not caught in outdated practices and approaches. This is a step in a continuum of professional learning for teachers to support effective teaching, learning, and assessment practices. This must also occur when a teacher is new to teaching kindergarten. Helping new kindergarten teachers and teachers new to kindergarten achieve their full potential creates a climate that only enhances student performance.

Yet another suggestion receiving more consideration today is the health and well-being of a kindergarten student:

> Beyond expanding the scope of services that can be identified and accessed from inside the schoolhouse doors, policymakers have a key role to play in ensuring that the communities outside those doors are ready to support their young children's learning and development. (Kagan & Kauerz, 2006, p. 169)

Kindergarten students must be aware of their bodies and acquire skills to keep them healthy and safe. This means that they understand how to make good decisions about simple health, respect others, and be responsible. Strengthening relationships between

schools and communities will help make this happen.

Full-Day Kindergarten Benefits

Research during the 1970s and 1980s on the debate between full-day and half-day kindergarten yielded contradictory results because much of the early research employed inadequate methodological standards, impacting internal and external validity (Puleo, 1988). Despite these conflicts, consistent findings appeared regarding the positive impact full-day kindergarten had on at-risk students. Many studies suggested that what children do during the day is as important as the length of the school day. In addition, despite the importance of kindergarten and its history, large-scale statistical studies have tended to focus on secondary levels, and even today results are far from being definitive. Nevertheless, Martinez and Snider (2001) found that there are no detrimental effects of developmentally appropriate full-day kindergartens.

In 2004 the National Center for Education Statistics (NCES) and the United States Department of Education examined differences between full-day and half-day kindergarten differences at the national level for the first time, using the Early Childhood Longitudinal Study-Kindergarten (ECLS-K) data for the 1998–1999 school year (Walston & West, 2004). A nationally representative sample used involved about 22,000 kindergartners and 1,200 public and private schools, using interviews, parent and teacher questionnaires, and direct child assessments. NCES found that teachers in full-day kindergartens organize instruction in much the same way as their half-day counterparts. The extra time was used to expose students to more advanced reading, writing, and mathematics skills. Given the non-experimental, pre-test/post-test design, there was no way to determine if the samples were equivalent at the beginning of kindergarten, making

it impossible to draw causal conclusions from these data. Multi-level regression analyses illustrated an average reading score gain from fall to spring of 10.04 points, with a standard deviation of 6.01. In math the gain was 8.19 points, with a standard deviation of 5. For both reading and math gains, score differences were associated with race/ethnicity, poverty status, initial ability, sex, instruction time, and the presence of an instructional aide. In addition to reading and math gains, NCES reported children in kindergarten classes with 25 or more students made smaller gains in reading compared to children in classes with 18 to 24 students (Walston & West, 2004). Last, it was found that children in classes that spent a relatively large part of the day on reading instruction (more than 90 minutes in full-day classes or more than 60 minutes per day in half-day classes) made greater gains in reading compared to children that spent less time.

Another study that supported advantages for full-day kindergarten was a meta-analysis of 23 research reports comparing the two programs. Most of the reports examined were not prospective studies but were analyses of previously existing data published between 1970 and 1991. Fusaro's (1997) meta-analysis used achievement tests as outcome measures for 21 studies, and two studies used teacher ratings. Results indicated that full-day kindergarten showed a higher degree of student achievement, with participation in a full-day program accounting for 59% to 62% of the difference in academic achievement between the two groups. However, Fusaro (1997) highlighted a few kindergarten studies that employed true experimental designs and thus cautioned against concluding causal relationships (r=0.79, indicating a large effect size). Fusaro also cautioned that full-day kindergarten taxes the stamina of less mature children who may become overly tired.

Research has also been conducted on the effect of full-day kindergarten and retention. In a study of 17,600 Philadelphia schoolchildren, students enrolled in full-day programs were twice as likely to complete second and third grade without being retained as students without any kindergarten experience and 26% more likely than children in half-day programs (Viadero, 2002). In addition, students enrolled in full-day programs scored higher on standardized reading and math tests, received better grades, had fewer special education referrals, and demonstrated better attendance. Similar results were identified in 1992 when the Ohio Department of Education (1992) conducted a longitudinal study that investigated retention rates for two cohorts involving 59 school districts. Retention rates of Cohort 1 were 16% for half-day students and 10% for full-day students, compared to 9% and 4%, respectively, for Cohort 2. In both of these studies, it was evident that positive results are not simply a result of increasing the length of the school day but rather how teachers fill that extra time by providing developmentally appropriate activities.

Baskett, Bryant, White, and Rhoades (2005) evaluated the educational effects of a transition from half-day to full-day kindergarten in an economically challenged suburban-rural school district in Maine. A child developmental scale and educational measures were used to calculate differences in improvement scores between students enrolled in half-day kindergarten (109) one year and children enrolled in full-day kindergarten (119) the following year. Also, parent surveys and teacher comments focused on parent and teacher attitudes toward full-day kindergarten. Both parent and teacher evaluations were strongly favorable of the district change from half-day to full-day programming. Significant differences were found in favor of all-day kindergarten in reading level,

literacy skills, letter sounds, and story sequence. "Follows directions" was of marginal significance ($p<0.10$). The change scores were favorable for full-day kindergarten but did not attain statistical significance in "works left to right" and "creates patterns"; alphabet recognition change scores, on the other hand, are better for half-day kindergarten but were not statistically significant.

A 2008 study by Zvoch, Reynolds, and Parker, involving approximately 400 participants in a large southwestern school district also investigated whether or not children in full-day kindergarten acquire literacy skills at a faster rate than comparable children who attend traditional half-day programs. The relationship between kindergarten program models and literacy acquisition using DIBELS as a measure was very consistent with other findings in that students in full-day kindergarten outperformed comparable students in half-day programs (Zvoch, Reynolds, & Parker, 2008). However, the researchers found the relative efficacy of full-day programs varied with respect to classroom enrollment size. In relatively small (<20) and moderately sized classrooms (20–24 students), full-day kindergarteners' rate of literacy acquisition was twice that of their peers in half-day programs. In relatively large classes (>24 students) full-day kindergartners acquired literacy skills at a slower rate relative to their counterparts in smaller-sized full-day classrooms and at a similar rate to their peers in large-sized half-day classrooms.

> The strong negative relationship between class size and literacy acquisition in full-day classrooms (r=-0.67) and the slight positive relationship between class size and literacy acquisition in half-day classrooms (r=0.12) suggest that K–12 stakeholders may need to more closely consider whether lengthening the school

> day in isolation from class size adjustments will be sufficient to achieve the outcomes. (Zvoch, Reynolds, & Parker, 2008, p. 104).

Instead of a pre-post gain score, students were measured on multiple occasions during DIBELS benchmarking, allowing the change in literacy status to be represented as a growth trajectory. These trajectories not only painted a more accurate representation of inter-individual differences in literacy achievement but also revealed differences between students in special population groups.

A 2006 study used a nationally representative sample of 8,000 kindergarten students from 500 public schools that participated in the earlier 1998–1999 ECLS-K study. Using multilevel methods, Lee, Burkam, Ready, Honigman, and Meisels (2006) showed that children who attend schools that offer full-day programs learn more in literacy and mathematics than their half-day counterparts. Using end-of-the year achievement adjusted for initial achievement and untimed standardized tests, the "children who experienced full-day kindergarten as a whole-school program were at an advantage in terms of their cognitive learning (effects of 0.93 between-school SD in literacy and 0.75 between-school SD in mathematics)" (Lee et al., 2006, p. 24). Moreover, their findings for kindergarten were not limited to disadvantaged children or to low-income or urban schools—all children benefited, in terms of learning more, when they attended full-day kindergarten.

The Community Preventative Services Task Force (2014) conducted a systematic full-day kindergarten literature search to assess the extent to which full-day kindergarten, compared with half-day kindergarten, prepares children, particularly those from low-

income and minority families, to succeed in primary and secondary schools and improve lifelong health.

Figure 1 shows the analytic framework the task force used to synthesize the evidence of the literature search. The framework depicts logical and hypothetical links between full-day kindergarten and outcomes, ending in health and health-related consequences. The findings did not demonstrate the specific effectiveness of full-day kindergarten for low-income and minority populations. The summary review demonstrated that, at least in the short term, children in the general population benefit more from full-day kindergarten in academic and social development. In addition, their review of the body of available studies shows that full-day kindergarten programs are more effective for low-income and minority populations compared to more affluent and majority populations.

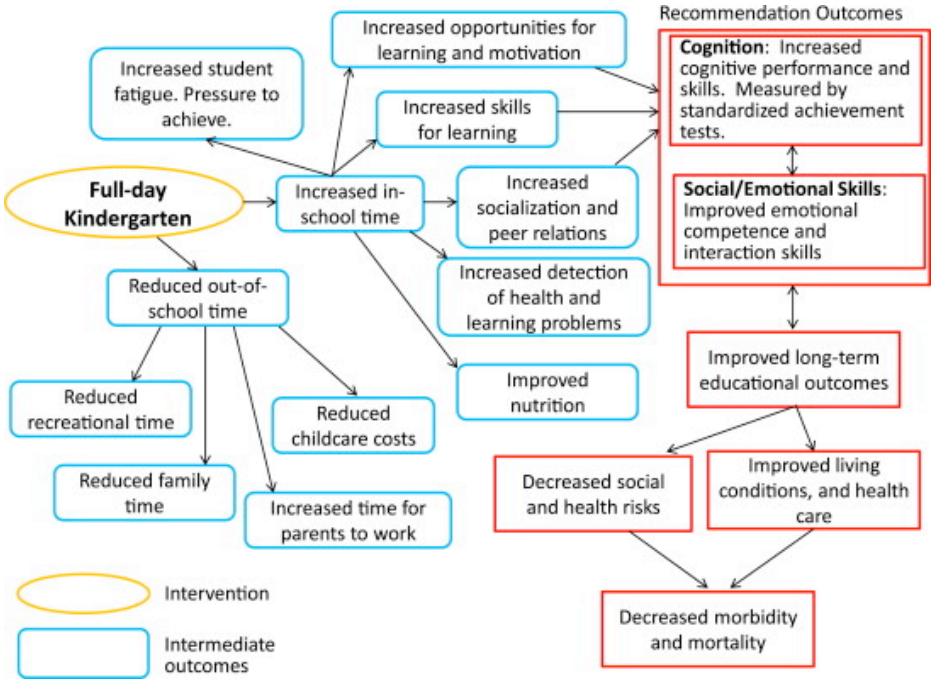

Figure 1. Analytic framework the task force used to synthesize the evidence of the literature search.

The Task Force also recommended that although achievement gains apparent at the beginning of first grade do not guarantee academic achievement in later years, full-day kindergarten programs improve the health prospects of minority children and children from low-income families (e.g., reduced teen pregnancy and risk behaviors).

Limitations of Full-Day Kindergarten

Despite the promising findings of the longitudinal studies conducted in Alaska, Ohio, Indiana, Maryland, Pennsylvania, and Virginia, there is not sufficient sound research regarding the sustainability of these benefits in student achievement, grade retention, and special education referrals. In addition, the magnitude of the positive

effect varies considerably from study to study, with many researchers reporting large effects, many others reporting small effects, and a minority reporting negligible effects. Although there is limited research supporting half-day kindergartens over full-day, there are few longitudinal studies of full-day kindergarten reporting promising data on the duration of benefits beyond elementary school experienced by students who attended full-day kindergarten (Plucker & Zapf, 2005).

As a result of the recent move to full-day programs by the most populous province, Ontario, the value of full-day kindergarten has been fiercely debated across Canada. Brownell, Nickel, Chateau, Marten, Taylor, Crockett, Katz, Sarker, Burland, Goh, and the PATHs Equity Team (2014) conducted Canada's first longitudinal, population-based study of full-day kindergarten outcomes beyond primary school using propensity score-matched cohort and stepped-wedge designs. Using population-based administrative data, they were able to follow 15 cohorts of children (*n* ranging from 112 to 736) up to Grade 9 and examine their performance on assessments in Grades 3, 7, 8, and their score on a Grade 9 achievement index. Where full-day kindergarten was introduced to all schools, they found only one statistically significant finding. Where full-day kindergarten was targeted to schools in low socioeconomic districts, out of the six outcomes examined, three long-term full-day effects had significance. Overall, their findings indicated wide-ranging long-term academic benefits of full-day kindergarten were unwarranted, but there may be some benefits from targeted full-day kindergarten programs under certain circumstances. Full-day kindergarten program targeted to low-income areas showed long-term improvements in numeracy for low-income females.

In 2006, Wolgemuth, Cobb, Winokur, Leech, and Ellerby compared the achievement of children who were enrolled in full-day kindergartens to a matched sample of students who were enrolled in half-day kindergartens in mathematics and reading achievement in Grades 2, 3, and 4. The 489 participants (283 students in half-day programs and 206 in full-day classes) were compared using letter knowledge assessments, number identification, one-minute reading assessments, and a standardized assessment developed by the Northwest Evaluation Association. Their findings revealed that children who attend full-day kindergarten can and do learn more than their half-day counterparts; however, the additional learning declines rapidly. They found that "by the start of first grade, the benefits of [full-day kindergarten] have diminished to a level that has little practical value" (2006, p. 267). The effect was consistent across two reading measures and one math measure.

In 2006, the RAND Corporation, which is a nonprofit research organization that provides objective analysis and effective solutions that address the challenges facing public and private sectors, analyzed 7,897 students, parents, teachers, and administrators and collected math and reading assessments five times: fall and spring of kindergarten and first, third, and fifth grade. They found that both academic and nonacademic school readiness skills (approaches to learning, self-control, interpersonal skills, internalizing behaviors and externalizing behaviors) at entry to kindergarten were significantly related to eventual reading and mathematics achievement in fifth grade. A longitudinal, cross-classified analysis was conducted and attendance in a full-day kindergarten was not related to fifth grade math achievement except when nonacademic school factors were considered. In addition to reinforcing findings that suggest that full-day kindergarten

programs may not enhance achievement in the long term, this study raised the possibility that full-day kindergarten programs may actually be detrimental to mathematics performance and nonacademic readiness skills.

> In other words, after controlling for nonacademic readiness at kindergarten, children who had attended a full-day program at kindergarten showed poorer mathematics performance in fifth grade than did children who had attended a part-day kindergarten program. This finding raises the possibility that earlier studies may have failed to find relationships between full-day kindergarten and outcomes because they omitted important information relating to nonacademic dimensions of readiness (RAND Corporation, 2006, p. xii).

With the exception of class size, few kindergarten program features were related to these five nonacademic readiness skills. Attendance in full-day kindergarten was positively associated with internalizing and externalizing behaviors. However, it was the home background qualities, such as higher income and higher parental school involvement, which related to a child's attitudes toward learning, self-control, and interpersonal skills. The study suggests to policymakers that funds need to be invested in other potential interventions that promote nonacademic readiness skills rather than full-day kindergarten programs. Similarly, Stofflet's (1998) long-term study of Anchorage School District's effects of full-day kindergarten found no major long-term effects related to the length of the kindergarten day. The researchers claimed that it is likely over time family background, individual study habits, and other school programmatic factors outweigh the length of the kindergarten program.

Using the same data and 78% of the entire sample of children (*N*=13,776) from the Early Childhood Longitudinal Study-Kindergarten Class of 1998–1999, Votruba-Drzal, Li-Gining, and Maldonado-Carreño (2008) looked to see if there were significant differences between children attending full-day versus half-day kindergarten by reviewing children's mean levels of academic achievement. More importantly, the study sought to identify to whether the kindergarten program type explained individual differences in academic trajectories from kindergarten through fifth grade using unconditional growth models. This was the first study to take a developmental approach to examining the implication of full-day versus half-day programs for children's learning trajectories. The study also considered whether or not full-day kindergarten is linked to greater initial growth of reading and math skills during the kindergarten year after taking into account the influences of poverty, important characteristics of children's homes, and child-care settings (parental education, parental marital status, primary spoken language). In answering their first research question, Votruba-Drzal et al. (2008) found that by the spring of kindergarten, children's mean levels of academic achievement in math were statistically indistinguishable. However, children in full-day kindergarten outscored their half-day counterparts in reading by one-tenth of 1 standard deviation.

> By the fall of first grade, children's mean achievement did not vary across program type and remained similar until the spring of third grade, when part-day kindergartners outscored full-day kindergartners on the math and reading skills measures by one tenth of 1 SD. (Votruba-Drzal et al., 2008, p. 964)

This disparity grew slightly in the spring of fifth grade. To consider whether the individual benefits of full-day kindergarten were sustained through the spring of fifth

grade, the researchers examined the achievement trajectories and found that these initial benefits were not sustained beyond kindergarten. In contrast, the academic skills of children in part-day kindergarten grew at a slightly faster rate than did those of children in full-day kindergarten. Although the achievement trajectories showed a small academic advantage across the kindergarten year, they converged soon after the students left kindergarten. In fact, the advantage faded out by the spring of third grade, with the part-day kindergartners pulling ahead (Votruba-Drzal et al., 2008).

Another study which displayed how full-day kindergarten gains are short-lived, particularly in minority children, was conducted by DeCicca in 2007. His sample of 714 public schools with 8,599 children analyzed the gains by race. Baseline math and reading tests were given before students had much exposure to the kindergarten curriculum and then assessed again at two later times (the end of kindergarten and the end of first grade). White full-day kindergartners had an estimated 17% gain over their half-day peers in math and nearly a 19% gain in reading. Longer-term (end of first grade) estimates differed in that the 17% math gain dropped to 8% and the 19% gain in reading became just over 5%. Similar to White children, Black students in full-day kindergarten had about an 11% gain in both reading and math, only to see a less than 1% gain in the longer run. To a greater extent than either White or Black children, full-day Hispanic students exhibited a short-run math gain that was close to 16% higher than their half-day peers and a 24% reading gain. Again, moving to the longer run, DeCicca found no evidence that Hispanic full-day kindergartners retained any of their sizable short-term advantages. Overall, the findings suggested that any short-term differences in math and reading proficiency due to full-day programming vanished by the end of first grade.

Early Literacy Development between Genders

Concern has been expressed over a deficit in reading achievement for males for over a century. With an increased emphasis on student achievement and high-stakes tests, schools are trying to narrow any and all gaps. Students with academic risks typically have lower reading rates compared with students without academic risks. Gilliam (2005) reported that boys are five times as likely as girls to be expelled from pre-kindergarten, that boys in early elementary school continue to be more disruptive than girls, and that they are less engaged in learning. Klecker's (2006) analysis of fourth, eighth, and 12th grade students' National Assessment of Educational Progress (NAEP) reading comprehension scores from 1992 to 2003 indicated that females outperformed males every year at all three grade levels. The study suggested that today's school improvement efforts, including NCLB, should take a more careful look at males and reading across all grade levels. Research findings also suggest that boys have weaker reading skill development upon entering kindergarten. Despite the concerns for male deficits in overall reading achievement that have been expressed for more than 100 years, few studies have focused on changes in or the development of reading skills for boys. Advocates of full-day kindergarten propose it is yet another benefit of full-day programs.

In contrast, critics contend that a change in learning programming does not explain any possible cognitive learning differences between males and females. Researchers have examined possible contributions to this male deficit. Interest and/or motivation has been one reason (Brozo, 2002). Boys prefer reading nonfiction and informational materials that provide facts over fictional materials and elementary school reading materials are mainly fictional. Cultural and societal factors may also contribute

to male deficits in reading skills. Differential response theory is based on the notion that teacher behavior towards students is influenced by both the behavior of the students and the assumptions about what that student usually does. This hypothesis suggests that the higher expectations teachers hold for female students are likely to turn into self-fulfilling prophecies.

Using a cross-sectional design and the DIBELS measures, Below (2010) tested this theory along with potential gender differences in reading skills for 1,218 kindergarten through fifth-grade students. The design did not control for variables that may affect differences in reading performance such as curricula and teacher experience, and the sample was small, taken from a single geographic location. In addition, comparisons of scores were limited by the DIBELS measures. The results suggested that significant gender differences in pre-reading skills found in earlier grades were not significant in later grade levels. Oral reading fluency showed a significant advantage for girls in fourth grade, although this was not significant in fifth grade. The researchers commented that due to previous studies on gender differences in reading, self-fulfilling prophecies exacerbate these differences. These results may "mitigate these self-fulfilling prophecy effects and prevent educators from assuming that boys will never be as strong as girls with respect to reading skills" (p. 254).

In contrast, Chatterji (2006) also examined the results from the 1998–1999 Early Childhood Longitudinal Study of 2,296 kindergarten and first grade students. It was discovered that males performed below females on tests of print familiarity, letter recognition, beginning and ending sounds, rhyming words, word recognition, receptive vocabulary, listening comprehension, and comprehension of words in context. The size

of the male deficit increased from 0.17 SD units below females at kindergarten entry to 0.31 SD units below females at the end of first grade. Similarly, Camarata and Woodcock's 2006 research also found that males scored significantly lower on reading and writing measures of the Woodcock Johnson Psycho-Educational Battery. When they compared the performances of 1,102 females and 885 males, ages preschool through adulthood, they found that males scored significantly lower on tests measuring reading and writing. These differences increased through adolescence and only dropped off in young adulthood, unlike Below's (2010) research findings, where significant gender differences in pre-reading skills found in earlier grades were not significant in later grade levels.

DiPrete and Jennings (2011) sought to explain the academic advantages females possess on standardized tests from the start of kindergarten. The results demonstrated that social and behavioral skills are an important resource for school success. In addition to suggesting that social and behavioral skills are critical to these differences, they wanted to learn to what extent these skills affect learning gaps. The researchers also analyzed data from the Early Child Longitudinal Study-Kindergarten Cohort. Their results demonstrated that social and behavioral skills are an important resource for school success in elementary school. Girls had a considerable lead over boys in these skills and this advantage accounted for a female academic advantage in elementary school.

DIBELS and DIBELS Next

DIBELS, developed initially by researchers at the University of Oregon in the late 1980s, was a catchphrase in schools when it became the required national assessment under Reading First, a federal grant adopted under the No Child Left Behind Act (2001).

States receiving the funds collect DIBELS data to help determine whether students read proficiently. In 2002 the Director of the Bureau of Special Education for Pennsylvania's Department of Education saw the Reading First initiative as a catalyst for changing primary reading instruction across the state and reducing special education referrals. In 2010, DIBELS 6th edition was replaced by DIBELS Next (Good & Kaminsky, 2011).

As the result of the reauthorization of Individuals with Disabilities Education Improvement Act in 2004, Response to Instruction began to influence schools. Response to Instruction (RTI) is an instructional framework that integrates assessment with instruction to "identify students at risk for poor learning outcomes, monitor student progress, provide evidence-based interventions, and adjust the intensity and nature of those interventions based on a student's responsiveness" (National Center on Response to Intervention, 2010). Assessment is at the center of the decision-making model of the RTI framework. Practices connected with Response to Instruction included screening all students in order to provide students with progressively greater supports (Gresham, Reschly, & Shinn, 2010). DIBELS, a universal screener, identifies children who are not making adequate progress; that is, those who are "falling behind" in response to Tier 1 instruction and who may benefit from additional instructional support. Typically, RTI models consist of three tiers of instructional progressions where all children receive Tier 1 instruction. Tier 1 is usually the core reading and math curriculum that is aligned to the state standards and delivered with fidelity across a grade level. Children in need of supplemental intervention receive additional instruction at Tier 2 or Tier 3 in small groups. Tier 2 consists of children who fall below the expected levels of accomplishment (called benchmarks) and are at some risk for academic failure but who are still above

levels considered to indicate a high risk for failure. Tier movement, both up and down, is identified through the assessment process

A popular attribute of DIBELS is that it is quick, reliable, and teacher-friendly. DIBELS is designed to be an efficient, cost-effective tool used to help make decisions about reading instruction, to help the teacher provide early support, and to prevent the occurrence of later reading difficulties. Good, Simmons, Kame'enui, Kaminski, and Wallin (2002) developed a technical report highlighting the decision rules for instructional recommendations by establishing cutoffs and identifying students who were unlikely to achieve future early literacy skills without intervention. DIBELS assesses basic early literacy skills, or the essential skills that every child must master to become a proficient reader. Although the exact number of schools using the tests is unknown, more than 8,200 schools in 2,600 districts (approximately 2,000,000 students across 40 states) manage DIBELS results in a data-management system offered by the University of Oregon (Manzo, 2005). DIBELS aligns with the principles of reading achievement as illustrated in *Put Reading First: The Research Building Blocks for Teaching Children to Read* (Armbruster & Osbom, 2001). This publication, developed by the Center for the Improvement of Early Reading Achievement from the findings of the National Reading Panel (2000), provides analysis and discussion in five areas of reading instruction: phonemic awareness, phonics, fluency, vocabulary, and comprehension.

In addition to being an assessment, DIBELS is a screening instrument with a progress monitoring component. DIBELS not only determines whether all the major skills are in place for a student to be literate but also can be used to review the efficacy of a school's reading curriculum.

> DIBELS does not tell the teacher what to teach or how to teach, but rather the measures simply tell the teacher how well the instruction is working within the context of foundational literacy skills for each student who may require such close and accurate monitoring. (Langdon, 2004, p. 55)

Therefore, it is a tool that helps students who are having difficulties learning basic literacy skills through early intervention and early prevention instead of through strict remediation. According to the National Institute of Child Health and Human Development, Lyon and Fletcher (2001) stated that it takes four times longer to remediate a student with poor reading skills in fourth grade than it requires in late kindergarten or early first grade. Also, preventing reading difficulties in kindergarten through third grade is more cost-effective and efficient than later remediation. This preventive model was based on a couple of important premises about early reading. Hall (2006) stated that first, all but a few children can be taught to read competently; "second, relying upon research findings about assessment tools and the components of effective instruction can prevent reading failure" (p. 1).

The main validation of DIBELS is that it predicts performance on state reading tests (e.g., Buck & Torgesen, 2003; Carlisle, Schilling, Scott, & Zeng, 2004; Elliott, Lee, & Tollefson, 2001; Hintze, Ryan, & Stoner, 2003; Shaw & Shaw, 2002; Vander Meer, Lentz, & Stollar, 2005; Wilson, 2005). Predictive power is the ability of an assessment instrument to accurately and reliably identify students most likely to experience reading success or have future reading difficulties. Most of these results were connected with federally funded reading efforts, and overall the studies found moderate to high correlations ranging from .60 to .80.

Munger and Blachman (2013) explored more fully the predictive validity evidence of first grade DIBELS subtest scores in relation to third grade reading comprehension scores. Results showed that predictive validity coefficients between DIBELS ORF and each of the three measures of reading comprehension were generally strong and stretched between .56 and .72. No other DIBELS subtest score described any additional significant variance in reading comprehension. Several additional studies supported the findings of Munger and Blachman, suggesting that end-of-first grade DIBELS ORF scores appear to have the strongest validity evidence. Research by Kim, Petscher, Schatschneider, and Foorman (2010) found that growth in DIBELS ORF was the strongest predictor of third-grade reading comprehension scores on the Stanford Achievement Test-10. Johnson, Jenkins, Petscher, and Catts (2009) found significant correlations between first-grade DIBELS ORF and the third-grade Florida state test (FCAT; $r = .55$), whereas Gof-freda, DiPerna, and Pedersen (2009) reported a similar correlation between first-grade DIBELS ORF and the third-grade Pennsylvania state test (PSSA; $r = .54$). Wanzek et al. (2010) also found significant correlations among end-of-first-grade DIBELS ORF scores and two measures of third-grade comprehension, including the SAT-10 ($r = .64$) and the Texas Assessment of Knowledge and Skills ($r = .44$).

However, success entails much more than just owning or administering a tool. There are debates about using DIBELS as a measurement tool of reading skills and the relation between DIBELS and reading development continues to draw mixed reviews. DIBELS has been criticized for exploiting one aspect of reading relevant to the simple views, word recognition, to the exclusion of the other aspect, language comprehension

(Munger and Blachman, 2013). The missing piece is what is done with the information yielded from the assessment. DIBELS was specifically designed as an instructional tool to help teachers determine whether a student is developing the skills needed to become a proficient reader (Goodman & Kaminsky, 2002). The Nonsense Word Fluency (NWF) measure is one of the DIBELS tests that assess a student's ability to sound out letters and to blend these sounds to form words. The fact that this test utilizes nonsense words is what brings it under scrutiny. It goes against the principle of teaching students to read for meaning. The National Reading Panel (NRP) reported that reading comprehension is a critical component of children's educational as well as lifelong learning (NRP, 2000).

Critics also cite that educators teach to the reading measures and give the assessment too much weight to gauge reading ability (Manzo, 2005). Manzo also pointed out how DIBELS got the competitive edge because its developers and their colleagues at the University of Oregon were consultants to the U.S. Department of Education for Reading First, with one of the main developers, Mr. Good, being one of the persons who evaluated 29 early literacy tests, including his own product. There is growing concerns that there is insufficient validity evidence to justify its widespread use (Manzo, 2005).

Some researchers inquire as to whether a student's speed at reading nonsense words or carefully crafted passages has any relationship to the ultimate goal of comprehension or becoming a lifelong reader. "If, as a result of using DIBELS to guide instruction, kids read more, read more enthusiastically, and [with] greater comprehension, wrote with greater facility, and felt better about themselves as readers, then I would back off this critique" (Goodman, 2006, p. xv). Some skeptics often feel that the information derived from DIBELS adds no additional predictive power over teacher evaluation and

professional judgments, making it more difficult to absorb the costs of administering the assessment three times a year. Goodman (2006) and Manzo (2005) identified a major downfall of DIBELS in that it is not an adequate indicator of comprehension. This is problematic because a misallocation of resources may occur. For instance, students with strong comprehension skills but low DIBELS scores may receive unnecessary interventions, whereas students with high DIBELS scores but poor comprehension might not receive appropriate support (Riedel & Samuels, 2007).

The four DIBELS Next reading measures are Letter Naming Fluency (LNF), First Sound Fluency (FSF), Phoneme Segmentation Fluency (PSF), and Nonsense Word Fluency (NWF).

LNF is a measure of alphabetic awareness that assesses a child's ability to name as many letters as he or she can in one minute. The examiner presents an array of upper and lower case letters presented in random order and asks students to name as many letters as they can. If a student does not know the letter, the test administrator tells it to the student; and the score is the number of letters named correctly. Students are considered at risk for difficulty in achieving early literacy benchmark goals if they perform in the lowest 20% of students in their district; that is, below the 20th percentile using local district norms. Students are considered at some risk if they perform between the 20th and 40th percentile using local norms. Students are considered at low risk if they perform above the 40th percentile using local norms.

The knowledge of letter names measured just before children enter school has been known for a long time as one of the best longitudinal predictors of learning to read. Ehri and Wilce (1987) found that children who did not know letter names had more

difficulty learning letter sounds. Ehri and Wilce showed that knowledge of grapheme-phoneme correspondences provided a mnemonic system that links spellings to pronunciations and enhances memory for words. Children who had seen spellings remembered the words much better than those who had not. The relationship between children's ability to benefit from spellings in remembering the words and their sight vocabularies was very high, supporting the idea that this mnemonic system provides the "glue" that secures sight words in memory.

Roberts (2003) provided experimental evidence that teaching children letter names facilitates sight word learning. She selected preschoolers who knew few if any letters and could not read. She taught letter names to one group and she read stories to the control group. In a sight word learning task given at the end of training, she found that the letter group learned to read simplified phonetic spellings more readily than visual spellings, whereas the control group showed the opposite pattern. Most of the phonetic spellings contained sounds from the letter names (i.e., LN for lunch) rather than full letter names. This study confirmed a causal relationship between letter name knowledge and sight word learning.

However, some researchers do not agree on the degree of importance of learning names of the letters in order to read. Some believe that students need to be able to associate the sounds with letters and do not need to know the letter names to read. For the past 15 years, researchers have been trying to develop ways of assessing young children's development in early reading and writing. Although the capability for sight word reading is present once children have mastered letters, this alone is not adequate to build a sight vocabulary. Even if students know alphabet letters and can read phonetic

spellings, they might not be able to quickly read common words, indicating they had not yet moved into reading.

The DIBELS Next First Sound Fluency (FSF) measure is a standardized, individually administered measure of phonological awareness that assesses a child's ability to recognize and produce the initial sound in an orally presented word. The FSF measure takes about three minutes to administer.

> Using standardized directions, the assessor says a series of words one at a time to the student and asks the student to say the first sound in the word. On the scoring page, the assessor circles the corresponding sound or group of sounds the student says. Students receive either 2 points for saying the initial phoneme of a word (e.g., saying the /s/ sound as the first sound in the word street) or 1 point for saying the initial consonant blend (e.g., /st/, /str/ in *street),* consonant plus vowel (e.g., /si/ in *sit),* or consonant blend plus vowel (e.g., /strea/ in *street).* A response is scored as correct as long as the student provides any of the correct responses listed for the word. The total score is based on the number of correct 1- and 2-point responses the student says in 1 minute. (DIBELS Next Assessment Manual, 2011, p. 39)

Phoneme Segmentation Fluency (PSF) is a brief standardized measure of phonemic awareness. It determines a student's capability to fluently segment three and four phoneme words into their individual phonemes. The student's score is the number of correctly named phonemes in one minute. The PSF measure has been found to be a good predictor of later reading achievement and is intended for use with students from the winter session of kindergarten to the middle of first grade (Kaminski & Good, 1996). The examiner administers the PSF task by orally presenting words of three to four

phonemes. The student is asked to produce verbally the individual phonemes for each word.

> The assessor underlines each correct sound segment of the word that the student says. A correct sound segment is any different, correct part of the word the student says. The total score is the number of correct sound segments that the student says in 1 minute. For example, if the assessor says the word *fish* and the student says /f/ /i/ /sh/, the student has completely and correctly segmented the word into its component sounds and the score is 3 correct sound segments. If the student says /f/ /ish/, the score is 2 correct sound segments. (DIBELS Next Assessment Manual, 2011, p. 55)

One recent study examined the intervention validity of the DIBELS PSF measure (Hagans, 2008). In this study, the PSF and NWF subtests were used to monitor the acquisition of literacy skills for 75 first grade students. Students were randomly assigned to either a treatment group receiving early literacy instruction or a control group. The independent variables examined during the investigation included the socioeconomic statuses of student families and instructional program participation. The effects of instructional groups on early literacy skills as measured by PSF were examined using hierarchical linear modeling. The study's findings support the practice of using results from the PSF subtest to inform instructional planning, which subsequently resulted in increased phoneme segmentation skills for participants.

Nonsense Word Fluency (NWF) is also a standardized measure that assesses a student's alphabetic principle skills and takes about two minutes to administer. Students in kindergarten to the beginning of second grade are tested on their ability to associate

sounds with letters and to use these sounds to form words. Because letter-sound fluency tasks measure both the accuracy and speed with which a child can provide the sounds of the letters of the alphabet, it may be particularly well suited for predicting later reading ability (Speece, Mills, Ritchie, & Hillman, 2003). NWF tests alphabetic principles, including letter-sound correspondence and the ability to blend letters into words in which letters represent their most common sounds.

> Following a model and a practice item, the student is presented with a sheet of randomly ordered VC and CVC nonsense words (e.g., *dif, ik, nop).* Standardized directions are used to ask the student to read the make-believe words the best they can, reading either the whole word or saying any sounds they know. For example, if the stimulus word is *tof,* the student could say /t/ /o/ /f/ or "tof." The assessor underlines each correct letter sound produced either in isolation or blended together. Whole words read without sounding out are underlined in their entirety. (DIBELS Next Assessment Manual, 2011, p. 66)

The measure is fluency-based; therefore, the students receive a higher score if they are phonologically recoding the whole word rather than providing letter sounds in isolation.

The study conducted by Speece et al. (2003) also examined the validity of the LNF and NWF subtests of DIBELS using a sample of 39 kindergarten students. The study found NWF to be a valid measure of early reading and poor reader status. As a result of the research, Speece et al. (2003) concluded that fluency in reading subskills supports reading connected text.

Keith Stanovich (2002), a professor of human development and applied psychology, compiled a review of the cause-and-effect relationship of children's overall reading ability to decode pseudo-words. He found that the speed of naming pronounceable non-words is one of the tasks that most clearly differentiate good readers from poor readers. Stanovich also stated that the inability to read pseudo-words has an incredible reliability for predicting reading difficulty.

According to Vanderwood (2008), correlation studies have indicated that phonological awareness, defined as the ability to manipulate sounds in words orally, has a strong concurrent and predictive relationship to success in reading. An increase in phonological ability correlates to an increase in reading ability.

In contrast, several researchers have challenged the validity of the NWF assessment. Fuchs, Fuchs, and Compton (2004) highlighted how two students with very different performance patterns may receive equal scores on the test. A student who can only produce separate sounds for a CVC nonsense word could earn three points for saying each sound in isolation—the same score as a student who can blend those sounds into the whole word. It is clear that a student who can blend the sounds has a stronger reading capacity than the student who can only represent separate sounds. It was also observed that many low-performing students were capable of saying many sounds quickly, without achieving the alphabetic insight required for blending.

Fuchs et al. (2004) also determined that students who perform well with NWF/ CVC pseudo-words may or may not be skilled at reading consonant-vowel-consonant words—e words, r-controlled words, dual vowel words, multi-syllabic words, etc. The restriction of the NWF task to a single easy phonetic pattern may reduce the correlation

between NWF and reading proficiency as students progress through the middle to end of first grade into second grade.

In addition, Harn, Stoolmiller, and Chard (2008) determined that students who approach the NWF task using the sound-only strategy do not perform well on the Oral Reading Fluency (ORF) subtest of DIBELS. The ORF test measures a student's ability to read a grade-appropriate passage fluently and accurately and has been found to be highly predictive of future reading proficiency.

An investigation conducted by Rouse and Fantuzzo (2006) examined the convergent and predictive validity of three DIBELS subtests administered at the end of kindergarten. The subtests included LNF, PSF, and NWF; and scores were analyzed along with standardized scores from outcome reading measures administered at the end of first grade. Results of a canonical correlation analysis indicated significant predictive relationships between the early literacy skills measured at the end of kindergarten and the literacy constructs measured at the end of first grade. All three DIBELS subtests taken together explained approximately 52% of the variance in instructional reading from the *Developmental Reading Assessment* (Beaver, 1997). LNF appeared to be the strongest predictor of instructional reading level, followed by NWF and PSF.

Theoretical Framework

Kindergarten research is grounded in the work of past theorists, educators, and practitioners and has implications for what happens in thousands of classrooms every day. For instance, John Dewey, an early developer of the philosophy of pragmatism, pointed out that reflection is a "meaning-making" process and moves a learner from one experience into the next with deeper understanding (Dewey, 1906). Dewey's platform

stressed the importance of curricula that engage students and encourage teachers to involve students with curricular decisions. Students construct their own understandings of the world and will gain more knowledge through exploration and active learning. Constructivism values developmentally-appropriate facilitator-supported learning that is initiated and directed by the learner. This is the path through which educators (facilitators) wish to approach students in constructing meanings of new concepts. When construction of a school's curricula is not only prioritized but also emphasizes activities that are meaningful, student achievement will increase. "One school fixes its attention upon the importance of the subject-matter of the curriculum as compared with the contents of the child's own experiences" (Dewey, 1906, p. 11). Full-day kindergarten permits meaningful curricula that allow for this deeper understanding and makes the child, not the curriculum, the starting point and end.

Play is often recognized as a precursor of a child's ability to communicate and collaborate. "A child's play is not simply a reproduction of what he has experienced, but a creative reworking of the impressions he has acquired" (Vygotsky, 2004, p.11). In kindergarten, this does not mean "anything goes"; but instead, it means to strike a healthy balance of child-initiated play with more focused, guided instruction directed by the teacher. Despite the research, some believe school is meant for learning and play should be left for home. Play is rapidly disappearing from kindergarten and early education as a whole. Siraj-Blatchford (2009) reminds us that learning has content as well as form. Whenever learning takes place, we can say that a curriculum is involved. For Vygotsky (2004), this was the whole point of defining the zone of proximal development. He believed education's role was to give children experiences that were within their zones of

proximal development, thereby encouraging and advancing their individual learning. Learning is a form of social development, according to Vygotsky. During play, adults do not have predefined correction solutions, and they cannot help the children find them. "The power of play can be the engine of learning in early childhood and a vital force for young children's physical, social, and emotional development" (Miller & Almon, 2009).

Behaviorists rely on the "theory of motivation." Learning is the result of changes in behavior; and as stimulus-response cycles are reinforced, individuals are "conditioned" to respond. Student ownership and play-based learning offers intrinsic motivation. B. F. Skinner believed that positive reinforcement is a much better motivator than punishment. The implications of early childhood changes reach far beyond schools. Until recently, few people discussed the long-term effects of the disappearance of children's play. Much of today's curricula are based on teachers' past experience in school, input from textbook manufacturers, discipline frameworks, standards and information from peers. Daniel Pink, author of *A Whole New Mind*, says that "people have to be able to do something that can't be outsourced, something that's hard to automate." Opportunities for play and creativity in kindergarten won't solve these problems alone, but may provide young children with traits that scripted teaching and standardized tests do not (Miller & Almon, 2009).

The emphasis on moral education, teaching children the difference between right and wrong, is a controversial subject. With recent school violence headlines, peoples' perceptions of whether or not moral education should be taught are changing. Teachers face the challenge of whether moral education should be part of the hidden curriculum or formally be part of the written and taught curriculum. Regardless, it is agreed that moral

education begins in early preschool and that understanding moral development in kindergarten allows teachers to assess the students and recognize their targets. Kohlberg's (1958) theory of development of moral judgment, which consists of six stages of moral reasoning that are grouped into three developmental levels, is at the core of this research. The pre-conventional level observed in infancy and early childhood describes moral judgment based on consequences and rewards (Stage 1) or reciprocity of interests (Stage 2). Starting in late childhood and extending through adolescence and adulthood, the focus shifts to what benefits others (Stage 3) and is approved by them (Stage 4). Finally, at the post-conventional level, moral reasoning goes beyond the dictum of authority to one based on social contract orientation (Stage 5). The highest stage of moral development involves the deployment of principles in decision-making, regardless of personal sacrifice (Stage 6). Values are shaped from experiences inside and outside of school and vary from child to child.

Kindergarten policies do shape lives, and the structure of the classroom affects the goals and approaches within the classroom. Kindergarteners learn through a complex school system, and an analysis of moral development theories suggests that moral education is crucial for kindergarten teachers. Teachers must not force students to learn right and wrong but should create an environment for students to explore moral issues in a constructive manner (Duckworth, 1964).

> The early education field is heavily skewed in the direction of Piagetian developmental psychology. In Piaget's words (cited by Duckworth, 1964, p. 3), the goal of education is not to increase the amount of knowledge, but to create the possibilities for a child to invent and discover. When we teach too fast, we keep

> the child from inventing and discovering himself. Teaching means creating situations where structures can be discovered; it does not mean transmitting structures.

Vygotsky, who provided an alternative to Piaget, believed that learning leads development. Although different, both would agree that young children should not be force fed what to think and how to learn. Rather, curricula should be based on the fact that children's interests will lead them to appropriate learning and offer a continuum of possibilities, ranging from incidental teaching to direct teaching (Hatch, 2010).

The goal of kindergarten should be the transfer of learning; it should not only be to be successful at school and prove through assessment that one learned what was taught (Dewey, 1902). In a modern assessment, the challenge is to look forward and not backward. Assessments influence the way in which students learn and how much they learn; they also impact the content that teachers select. Grant Wiggins (2011) emphasized the importance of authentic assessment, where student performance is examined through worthy intellectual tasks and not standardized tests. Although standardized tests do serve a purpose, they are not assessments that are part of students' everyday learning. They do not provide feedback to the student and do not provide opportunities to reteach. In addition, current testing techniques neglect more complex thinking processes. "Putting curriculum, instruction, and assessment into an interlocking bundle makes sense for teachers' instruction and children's learning" (Hatch, 2010, p. 9). Wiggins believed that we must determine if students are ready for future challenges in which they must transfer prior learning (Wiggins, 2011). Alternative assessments must

motivate students to take more responsibility and apply knowledge, rather than memorize information and develop basic skills.

Abraham Maslow's *A Theory of Human Motivation* (1943) highlighted that humans have an innate natural drive to become the best person through a hierarchy of basic needs. Teachers can help students learn to meet their own safety and friendship needs. These basic needs must be met before education can take place in school. Creating positive and nurturing human relationships between teachers and students and among students is one of the most important issues of school improvement. Achieving Maslow's utopian state of self-actualization, where an individual does what he or she is suited for, is reached only when lower-level needs are completely fulfilled. According to Maslow's hierarchy, when one feels threatened, needs higher up the pyramid will not receive attention until that need has been resolved (Maslow, 1943).

Summary of Literature Review

The majority of research on full-day and half-day kindergarten indicated that full-day kindergarten programs had short-term benefits and positively impacted minority and disadvantaged students. The results for long-term benefits are inconclusive. In addition, research that studied developmentally appropriate full-day kindergarten programs found no harmful effects to students when compared to half-day kindergarten. Critics of full-day kindergarten programs are cautious of the tremendous financial burden on the public and on school districts. In addition, there is limited research documenting how the additional time is spent in full-day kindergarten and whether the impact continues after third grade.

Lash, Bae, Barrat, Burr, and Fong (2008) reviewed the research design of 299 unduplicated references of literature on full-day kindergarten from 1998-2008. They concluded that studies of full-day kindergarten whose results have been reported within the last decade cannot provide strong evidence with which to judge the effect of a full-day program on student achievement. This is because studies have used weak research designs that do not control for factors other than the kindergarten programs that can affect outcomes. Therefore, only associations, not causal relationships, may be suggested.

Following is a list of predominant associations that have evolved over time regarding full-day and half-day kindergarten programs, as highlighted by Cooper, Allen, Patall, and Dent (2010):

Potential Positive Effects of Full-Day Kindergarten

For students

- Better academic skills development
- Reading readiness
- Higher standardized test scores
- Less grade retention
- Fewer referrals to special education services
- More independent learning
- Easier transition to first grade
- Better socialization and peer relations
- Positive influence on self-esteem, self-confidence

For instruction and teaching

- Better student attendance

- More individualized instruction
- Less hurried instruction
- Less transition time between activities

For parents

- Lower child care costs
- Easier scheduling and transportation
- More contact with the teacher

For society

- Levels the playing field for disadvantaged children
- Decreased cost because of reduced need for retention and remediation

Potential Negative Effects of Full-Day Kindergarten

For students

- Causes higher expectations for first graders
- Increased fatigue, irritability, aggression
- Lengthened adjustment because of separation anxiety
- Poor role models in lunchroom, playground
- Loss of confidence, enjoyment of learning
- Less time for informal learning

For teachers and instruction

- Less planning time
- Lack of qualified teachers

For parents

- Child care needs of working parents still may not be met

For society

- Costs (teacher salaries, space, benefits)

Access is still unequal for disadvantaged students

CHAPTER III

METHODOLOGY

Introduction

This study was designed to examine the pre- and post- kindergarten reading achievement scores, as measured by DIBELS Next of full-day and half-day kindergarten programs. In addition, the researcher investigated any differences between boys attending half-day kindergarten with boys in full-day programs. Similarly, the researcher investigated differences, if any, in the DIBELS Next composite scores for girls enrolled in full-day kindergarten compared to girls in half-day programs. The study did not compare whether one gender did better than the other. This chapter presents the strategy adopted in this study, including the research design, participants, research procedures and instrumentation, validity and reliability, procedures, data collection and data analysis.

Research Design

This case study utilized an explanatory, cross-sectional study and examined the effects of full-day and half-day kindergarten on student reading achievement scores using a quantitative methodology. Two groups of kindergarten students from two different school districts were compared: one group receiving full-day kindergarten and the other group participating in a half-day program. The independent variable was the length of the kindergarten program and the dependent variable was the DIBELS Next results over the course of one school year (2012-2013). Three major research questions addressed in this study:

1. What differences, if any, exist, in early literacy levels as measured by four DIBELS Next reading measures: Letter-Naming Fluency (LNF), First Sound Fluency (FSF), Phoneme Segmentation Fluency (PSF), and Nonsense Word Fluency (NWF), along with total composite scores, for students receiving full-day kindergarten when compared to students receiving half-day kindergarten?
2. What differences, if any, exist in the early literacy levels as measured by four DIBELS Next reading measures, along with total composite scores, for girls enrolled in full-day kindergarten as compared to girls in half-day kindergarten?
3. What are the differences, if any, in the early literacy levels as measured by four DIBELS Next reading measures, along with total composite scores, for boys enrolled in full-day kindergarten as compared to boys in half-day kindergarten?

Participants

The kindergarten students in District A , located in Allentown, Pennsylvania, are enrolled in a half-day kindergarten program. The district spans 72 square miles and encompasses three townships, North Whitehall, South Whitehall, and Upper Macungie, along with a small portion of the city of Allentown. The total population for the district is approximately 50,000 residents. The district is located approximately 60 miles north of Philadelphia in the semi-metropolitan region known as the Lehigh Valley. The regional population is approximately 600,000, including Allentown, the third largest city in Pennsylvania. Student enrollment is approximately 9,200. There are 11 schools in the district: eight elementary buildings, two middle schools, and a high school. The

elementary schools include grades K-5, with an enrollment of 3726. The middle school houses Grades 6, 7, and 8, with an enrollment of 2,277. The high school includes grades 9-12, with an enrollment of 3,147. The majority of the students, 74%, are identified as White Non-Hispanic; 10% as Asian or Pacific Islander; 4%, African-American; 10%, Hispanic; and 2%, all others.

The kindergarten students in District B, located in Nazareth, Pennsylvania, are enrolled in a full-day kindergarten program. The district is located near the eastern border of Pennsylvania in Northampton County. The district is immediately north and west of the cities of Bethlehem and Easton and includes the Boroughs of Nazareth, Stockertown, and Tatamy, and the Townships of Bushkill, Upper Nazareth, and Lower Nazareth. There are approximately 45,000 residents in the school district with increases in population expected due to new housing construction. The district is a combination of rural and suburban areas with farming, industrial, and professional work sites throughout the area.

Student enrollment is approximately 4,700. There are six schools in the district: three elementary buildings, an intermediate school, a middle school, and a high school. The elementary schools include Grades K-3, with an enrollment of 1,321. The intermediate school services students in Grade 4-6, with an enrollment of 1,052. The middle school houses Grades 7 and 8, with an enrollment of 740. The high school includes Grades 9-12, with an enrollment of 1,604. The majority of the students in the district, 85%, are identified as White Non-Hispanic; 4% as Asian or Pacific Islander; 2%, African-American (Non-Hispanic); 4%, Hispanic; and 2%, Multi-Racial.

The convenience sample were two independent cohorts of general education elementary school students in kindergarten. Students who attended the elementary school for half-day kindergarten during the 2012-2013 school year comprised Cohort 1 (*n*=111) in District A. Cohort 2 was represented by students who attended a different elementary school in District B for full-day kindergarten during the 2012-2013 school year (*n*=119). There were students in six kindergarten classrooms receiving full-day programs and six kindergarten classrooms receiving half-day programs in two different school districts. A total of nine kindergarten teachers participated in the study. Three teachers participated in the half-day kindergarten, and six kindergarten teachers were from the full-day school districts. All nine teachers were considered "highly qualified." A total of 59 males and 50 females participated from the half-day kindergarten, while 61 males and 50 females were in full-day kindergartens. Students in both school districts were assigned to homerooms to achieve age and gender balance and to accommodate any parent requests. Also, students receiving special education services were placed into homerooms where there was appropriate support. Thus, they were not assigned at random. Tables 1-5 show the demographic characteristics of the two elementary schools in the different school districts.

Table 1

School Specifics

School Specifics	District A/Cohort 1 Half-day kindergarten	District B/Cohort 2 Full-day kindergarten
Title I school	Yes (targeted-assisted)	Yes
Average Years of Educational Experience	14.75	14.03
Average Years of Educational Experience in the LEA	13.31	11.85

Percent of Classes Taught by Highly Qualified Teachers	100	100
School Enrollment	521	560
Percent of Gifted Students	4.99	2.86

Table 2

Percent Enrollment by Ethnicity

Percent Enrollment by Ethnicity	District A/Cohort 1 Half-day kindergarten	District B/Cohort 2 Full-day kindergarten
American Indian/Alaskan Native (not Hispanic)	.19	0
Asian (not Hispanic)	16.31	1.61
African-American	3.07	1.79
Hispanic	10.94	5.36
Multi-Racial (not Hispanic)	5.18	2.86
White (not Hispanic)	64.3	88.39

Table 3

Percent Enrollment by Student Groups

Percent Enrollment by Student Groups	District A/Cohort 1 Half-day kindergarten	District B/Cohort 2 Full-day kindergarten
Economically Disadvantaged	14.97	20.89
English Language Learner	3.26	1.43
Special Education	13.63	10.54
Female	49.33	48.04
Male	50.67	51.96

Table 4

Academic Performance Data 2013-2014

Academic Performance Data 2013-2014	District A/Cohort 1 Half-day kindergarten	District B/Cohort 2 Full-day kindergarten
School Performance Profile	91.7%	90.0%
PSSA Mathematics Proficiency/Advanced	88.41%	83.33%
PSSA Reading Proficiency/Advanced	81.52%	86.81%

Table 5

Kindergarten Teacher Experience/Degree/Salary

Kindergarten Teacher Experience/Degree/Salary	District A/Cohort 1 Half-day kindergarten	District B/Cohort 2 Full-day kindergarten
Classroom 1	26 years/Bachelor's/$88,278	14 years/Master's/$63,388
Classroom 2	1 year/Master's/$55,980	6 years/Bachelor's/$51,147
Classroom 3	19 years/Master's/$69,208	5 years/Bachelor's/$51,147
Classroom 4	Not applicable	21 years/Master's/$68,498
Classroom 5	Not applicable	11 years/Master's/$57,947
Classroom 6	Not applicable	6 years/Bachelor's/$51,147

Different language arts curriculums were implemented in the two districts during the 2012-2013 school year. District A used Lead 21, copyright 2011, published by McGraw-Hill Education. It was the first year the district used this reading program. District B employed Pearson Scott Foresman's Reading Street, copyright 2007, and the reading program was in its fifth school year. Both curriculums were commercial reading programs and possessed scripted instruction. This means that teachers used highly structured lessons with time parameters for specific skills and word-for-word scripts. Although different, each of the curriculums featured classroom differentiation that balanced whole group and small group instruction. Unlike anthology-based programs that follow a one-size-fits-all philosophy, both of these curriculums offered leveled text designed to meet diverse student needs. Through four differentiated readers (advanced, benchmark, strategic, intensive), students were ensured to read at their instructional level. Students read independently daily and both curriculums attempted to have all students read at or near grade level by the end of the program. In addition, they both emphasized five areas of reading instruction that were identified most effective by the National Reading Panel (2000): phonemic awareness, phonics, fluency, vocabulary, and

comprehension. Lead 21 and Reading Street strive to ensure equity for English language learners and both include text features such as labels, maps, diagrams, graphs, captions, charts, and side bars. In addition, they both offer a complete print and technology program offering online versions of each print component.

Both school districts used *Framework for Teaching* by Charlotte Daniellson in connection with mentoring, professional development, and teacher evaluation processes. *Framework for Teaching* identifies 22 components of effective teaching and divides them into four domains; planning and preparation, the classroom environment, instruction, and professional responsibilities.

This study posed no threat to any individual or group of students because only test scores were reported. Student identity by way of names and ID numbers were excluded, as districts provided only student scores and gender. All scores were kept confidential and the information obtained by the researcher was ex post facto data. The researcher communicated with the central office administrators, principals, and school boards to discuss the research. Central office administrators approved the data collection and study procedures.

Instrumentation

In this study, the Dynamic Indicators of Basic Early Literacy Skills (DIBELS Next), a set of standardized, individually administered measures of early reading achievement to the kindergarten participants, was the data that were disaggregated. Kindergarten students were assessed on four reading measures described in Table 6, which also illustrates the time of year in which each measure was administered. For each

participant, data were collected two times a year for each reading measure. Table 7 depicts the kindergarten benchmark goals and cut points for risk.

Table 6

Description and Administration Timeline of DIBELS Next Reading Measures

DIBELS NEXT Reading Measure	**Description**	**Beginning Of Year**	**Middle Of Year**	**End Of Year**
First Sound Fluency (FSF)	measure of phonological awareness that assesses a child's ability to recognize and produce the initial sound in an orally presented word	YES	YES	NO
Letter Naming Fluency (LNF)	measure assesses how many upper- and lower-case letters arranged in a random order can be identified	YES	YES	YES
Phoneme Segmentation Fluency (PSF)	measure assesses a student's ability to segment three- and four-phoneme words into their individual phonemes fluently	NO	YES	YES
Nonsense Word Fluency (NWF)	alphabetic principle - including letter-sound correspondence in which letters represent their most common sounds and of the ability to blend letters into words in which letters represent their most common sounds	NO	YES	YES

Table 7

Kindergarten Benchmark Goals and DIBELS Next Cut Points for Risk

Measure	Score Level	Likely Need for Support	Beginning of Year	Middle of Year	End of Year
Total Composite Score	At or Above Benchmark	Likely to Need Core Support	26+	122+	119+
	Below Benchmark	Likely to Need Strategic Support	13-25	85-121	89-118
	Well Below Benchmark	Likely to Need Intensive Support	0-12	0-84	0-88
First Sound Fluency (FSF)	At or Above Benchmark	Likely to Need Core Support	10+	30+	
	Below Benchmark	Likely to Need Strategic Support	5-9	20-29	N/A
	Well Below Benchmark	Likely to Need Intensive Support	0-4	0-19	
Phoneme Segmentation Fluency	At or Above Benchmark	Likely to Need Core Support	N/A	20+	40+
	Below Benchmark	Likely to Need Strategic Support		10-19	25-39

(PSF)	Well Below Benchmark	Likely to Need Intensive Support		0-9	0-24
Nonsense Word Fluency (NWF)	At or Above Benchmark	Likely to Need Core Support	N/A	17+	28+
	Below Benchmark	Likely to Need Strategic Support		8-16	15-27
	Well Below Benchmark	Likely to Need Intensive Support		0-7	0-14

Reliability and Validity

Numerous studies investigating the concurrent and predictive criterion-related validity of DIBELS scores with standardized test scores, particularly statewide assessments, have emerged in recent years. A majority of these studies feature the ORF indicator.

The University of Oregon's (Kaminski & Good, 1996), study involved two cohorts, one of 37 kindergarteners and one of 41 first graders, and investigated the reliability, validity, and sensitivity of three reading measures over a nine week period: Letter Naming Fluency, Phonemic Segmentation Fluency, and Picture Naming Fluency. The concurrent, criterion-related validity of the DIBELS measures was examined by correlating the DIBELS estimates with the following criterion measures: CBM Reading, McCarthy Scales of Children's Abilities, Metropolitan Readiness Test, Level 2, Stanford Diagnostic Reading Test, Rhode Island Pupil Identification Scale, and Teacher Rating Scale. "For kindergarten children, significant positive correlations were found for all DIBELS point and level estimates with all criterion measures (range = .43 to .90, $p < .01$)" (Kaminski & Good, 1996, p. 8). Reliability of point estimates was higher for kindergartners than for first graders where the reliability of DIBELS level estimates for kindergarteners ranged from .97 to .99, indicating that the measures were extremely stable.

In a more recent study meant to be an extension of Kaminski and Good's reliability and validity study, Elliot, Lee, & Tollefson (2001) drew from a larger and more diverse sample from an urban school district in a moderate-sized Midwestern city. The study looked at the psychometric properties of the modified version of DIBELS. Three types of reliability estimates were com interrater, test-retest, and alternate forms. All reliability estimates ranged from .80 to mid .90s with about one-half of the coefficients above .90. In examining validity, the criterion measures (The Woodcock-Johnson PsychoEducational Achievement Battery-Revised, The Test of Phonological Awareness, Teacher Rating Questionnaire, The Developing Skills Checklist, and The Kauffman Brief Intelligence Test) yielded validity coefficients ranging from .60 to .70. "The concurrent validity indicated that the DIBELS-M measures explained no less than 16% of the variance" (Elliot, Lee, & Tollefson, 2001, p. 9).

A kindergarten study (Hintze, Ryan, & Stoner, 2003), examined the concurrent validity between DIBELS and the Comprehensive Test of Phonological Processing, which assesses phonological awareness, phonological memory, and rapid memory. Patterns of correlations between the measures were reviewed. Results showed moderate to strong correlations between the DIBELS and the CTOPP, suggesting that both measure a similar construct. Surprisingly, the use of DIBELS cutoff scores yielded low levels of specificity, or an excessive number of proficient students identified as false positives for future risk. Therefore, they recommended lowering cutoff scores for the at-risk classification, allowing for a more conservative approach for providing early intervention. In the era of high-stakes decisions, low specificity levels could result in detrimental outcomes for students mistakenly identified as at-risk.

Pederson (2009) reported that further investigation is needed to address the limited evidence for some of the DIBELS indicators, particularly the validity of LNF, NWF, and PSF with statewide assessments. He investigated the predictive validity of DIBELS scores and confirmed ideas expressed by Hinze, Ryan, and Stoner (2003) are valid. Using a nonexperimental design, binary logistic regression was used to determine the predictive validity of first graders' winter DIBELS scores with second grade TerraNova proficiency validity. Similarly, he determined the predictive validity of the same scores with PSSA proficiency attainment in third grade. Although the results suggest that DIBELS significantly predicts future reading proficiency on both assessments, ORF risk categories were the only significant predictor of future TerraNova and PSSA reading proficiency.

Data Collection

In this study, the researcher collected the dataset of DIBELS Next scores from six full-day kindergarten classrooms and six half-day programs. The researcher requested the following background information for each kindergartner participant: age, gender, full- or half-day status, school, teacher, and poverty percentages. DIBELS Next was administered three times a year: beginning, middle, and end of the school year. In both school districts, the DIBELS Next reading assessment was administered by the participants' kindergarten teacher and the assessment data were entered into an Excel spreadsheet by the researcher.

Data Analysis

Pre- and post- assessment data for each DIBELS Next measure existed, and the researcher analyzed gain scores to determine whether or not there were differences between half-day and full-day at-risk kindergarten students and between genders. Using

descriptive statistics, the researcher calculated the mean of each reading measure during each benchmark assessment to indicate the average performance.

The researcher analyzed data from the DIBELS various scales. SPSS, a statistical software program, was used for the data analysis. Pairwise comparisons were analyzed at three time points: BOY-MOY, MOY-EOY, and BOY-EOY for all available data. There were two different kinds of data requiring different kinds of analyses. First, score data (e.g., BOY_FSF_SCORE) were a continuous variable and were analyzed with ANCOVA. An analysis of covariance was employed "to determine the effect of the independent variable on the average value of the dependent variable, after between-sample differences on the covariate have been eliminated" (Jaeger, 1993, p. 323). Second, level data (e.g., BOY_FSF_LEVEL) were originally presented as text data (nominal). The data were converted to an ordinal variable and analyzed with logistic regression, which provided results which can be interpreted exactly the same as the ANCOVA results.

The researcher conducted a secondary analysis because of comparability issues with the primary analysis and calculated the effect sizes to quantify the difference between full and half-day kindergarten. The effect sizes were calculated using the pooled standard deviation of the total composite scores between full- and half-day kindergarten. In addition, effect sizes between genders using pooled standard deviation were computed.

Summary

The study involved two rural elementary schools in two different Lehigh County school districts in the state of Pennsylvania. The participants were kindergartners who attended either a full-day program or a half-day program. ANCOVA was employed to

compare differences between the full-day and half-day students. DIBELS Next was the test used to determine the students early literacy skills. SPSS was utilized to do statistical analysis of the various variables identified for the study.

CHAPTER IV

RESULTS

Background

The purpose of this study was to investigate the difference, if any, in the reading achievement (for both boys and girls) when receiving full-day kindergarten programming versus half-day programs. This chapter presents the findings for full- and half-day kindergartners. Quantitative research methodology was used to analyze data related to the purpose of the study. A quantitative approach to this research was used to remove opinions and perceptions from data collection. Data were collected for this case study from two public school districts in rural Lehigh County, Pennsylvania. In both school districts, the DIBELS Next reading assessment was administered by the participants' kindergarten teacher, and the principals of the schools provided the researcher with the data. The researcher entered the data into an Excel spreadsheet. The researcher outlined the research and was granted permission for the data collection from the superintendents of both school districts. As required by APA, the researcher will hold onto the data for seven years. However, only the significant comparisons will be shared.

The first reason the two school districts were selected was that they have different kindergarten programs within Lehigh County in Pennsylvania and use DIBELS Next as a universal screener and a formative assessment that measures reading achievement. The second reason is that they have similar free- and reduced-lunch percentages. The convenience sample included six full-day kindergarten classrooms and six half-day kindergarten classrooms during the 2012-2013 school year.

The main research question for this study was What are the differences, if any, in early literacy levels as measured by four DIBELS Next reading measures: Letter-Naming Fluency (LNF), First Sound Fluency (FSF), Phoneme Segmentation Fluency (PSF), and Nonsense Word Fluency (NWF), along with total composite scores, for students receiving full-day kindergarten when compared to students receiving half-day kindergarten? Subsidiary questions for this study included the following:

1. What differences, if any, exist in the early literacy levels as measured by four DIBELS Next reading measures, along with total composite scores, for girls enrolled in full-day kindergarten as compared to girls in half-day kindergarten?
2. What are the differences, if any, in the early literacy levels as measured by four DIBELS Next reading measures along with total composite scores for boys enrolled in full-day kindergarten, as compared to boys in half-day kindergarten?

Descriptive Statistics of Full and Half-Day DIBELS Next Results

Data collected and analyzed throughout this research were utilized to draw conclusions concerning kindergarten programming and reading achievement. Conclusions drawn from this research may be used to inform kindergarten decisions for other school districts.

Table 8 illustrates the means for the four DIBELS Next reading measure scores and total composite scores according to the administration timeline. It is disaggregated by full- and half-day kindergarten status. Table 8 also depicts the means of kindergarten students scoring at benchmark on the four reading measures and the total composite level.

Last, Table 8 provides an illustration of the BOY/MOY mean gains and MOY/EOY mean gains for the four reading measure scores, total composite scores, reading measure levels, and total composite levels.

Full-day students' mean gain on their middle of the year total composite score was 15 points higher than those of half-day students. At the middle of the year, 73% of the kindergarten students were at the established category of attaining benchmark, compared to 82% of the full-day students. However, at the end of the year, 83% of the half-day students attained benchmark, whereas there was little difference for the full-day population (85%).

On the Nonsense Word Fluency reading measure, there was a mean gain of 20 points between the middle and end-of-year assessments with the half-day students. This equated to 82% of half-day students being classified benchmark on Nonsense Word Fluency by the end of the year. Although the full-day cohort had a 12 point mean gain, it did not increase the percentage of benchmark students on Nonsense Word Fluency at the end of the year.

Both full- and half-day students experienced a mean gain close to 11 points on the Phoneme Segmentation Fluency Score from the middle to the end of the year. However, this 11 points had a different impact on the full-day students compared to half-day. Only 1% (81.4% to 82.5%) of the half-day students changed to benchmark on Phoneme Segmentation Fluency at the end of the year compared to a 10% increase of benchmark full-day students (86.6% to 95.5%).

Table 8

Descriptive Statistics of Full- and Half-Day Kindergartners on the DIBELS Next

	ReadingMeasure	**BOY**	**BOY/MOY Gain**	**MOY**	**MOY/EOY Gain**	**EOY**
Group	LNF Score					
Half		26.84	*18.34*	45.18	*10.02*	55.20
Full		29.07	*18.42*	47.50	*9.50*	57.00
	FSF Score					
Half		16.50	*25.06*	41.56	X	x
Full		20.62	*24.20*	44.82	X	x
	PSF Score					
Half		X	X	35.47	*10.99*	46.46

Full		X	X	45.94	*11.45*	57.39
	Tot Comp Score					
Half		43.33	*107.80*	151.13	*-1.04*	150.10
Full		49.69	*122.80*	172.50	*-11.43*	161.07
	NWF Score					
Half		X	X	28.93	*19.51*	48.44
Full		X	X	34.24	*12.45*	46.68
	FSF Level					
Half		68.5%	*0.17*	85.5%	X	x
Full		78.4%	*0.12*	90.8%	X	x
	PSF Level					
Half		X	X	81.4%	*0.01*	82.5%
Full		X	X	86.6%	*0.09*	95.8%
	NWF Level					
Half		x	X	76.1%	*0.05*	81.6%
Full		x	X	82.4%	*0.00*	82.4%
	Tot Comp Level					
Half		75.7%	*-0.03*	72.6%	*0.10*	82.5%
Full		82.0%	*0.00*	82.4%	*0.03*	84.9%

Table 9 indicates the girls' means for the four DIBELS Next reading measure scores and total composite scores according to the administration timeline. It is disaggregated by full- and half-day kindergarten status. Table 9 also depicts the means of kindergarten girls scoring at benchmark on these four reading measures and the total composite levels. Last, Table 9 provides an illustration of the BOY/MOY mean gains and MOY/EOY mean gains that girls displayed for the four reading measure scores and measure levels along with the total composite scores and composite levels.

At the middle of the year, full-day girl kindergartners mean gain on the total composite score was 18 points higher than half-day students from the beginning of the year. This resulted in a mean gain of 3% of the number of full-day girl students being recognized as benchmark, whereas the half-day girl kindergarteners classified as benchmark had an 8% mean decrease.

At the end of the year, the total percentage of girls identified as benchmark decreased for both full and half-day girls compared to the beginning of year. Half-day girl kindergartners saw a 6% mean gain compared to the middle of the year, but it was still 2% lower than at the beginning of the year. Similarly, full-day girls saw a mean percentage decrease at the end of the year compared to the middle of the year (87%-83%), which was also approximately 1% lower than at the beginning of the year.

Although the mean gain between the end and middle of the year was similar on the Phoneme Segmentation Score (about 12 points) among full- and half-day girls, it had a different impact on girls being classified as benchmark on PSF (Phoneme Segmentation Levels). At the end of the year, this 12 point mean increase from the middle of the year had a 6% increase of half-day girl kindergartners identified as benchmark on Phoneme Segmentation Fluency compared to a 13% increase of full-day girls.

Nonsense Word Fluency saw a different mean result than Phoneme Segmentation Fluency with the girls. Although there was a 16 point mean increase on NWF score between the end and middle of the year, there was a 4% decrease of half-day girls classified as benchmark on NWF (77%-73%). Similarly with the full-day girls, a 12 point mean increase on NWF between the end and middle of the year yielded a 5% decrease of full-day girls classified as benchmark on NWF at the end of the year (83%-78%).

Table 9

Descriptive Statistics of Full- and Half-Day Kindergartner Girls on the DIBELS Next

Group	Reading Measure	BOY	BOY/MOY Gain	MOY	MOY/EOY Gain	EOY
	LNF Score					

Half		25.60	*19.69*	45.29	*7.73*	53.02
Full		30.14	*19.23*	49.37	*9.22*	58.59
	FSF Score					
Half		16.90	*24.62*	41.52	X	x
Full		20.10	*26.25*	46.35	X	x
	PSF Score					
Half		x	X	35.81	*11.37*	47.17
Full		x	X	46.59	*12.13*	58.72
	Tot Comp Score					
Half		42.50	*108.02*	150.52	*-6.42*	144.10
Full		50.24	*126.11*	176.35	*-13.37*	162.98
	NWF Score					
Half		x	X	27.90	*16.00*	43.90
Full		x	X	34.04	*11.63*	45.67
	FSF Level					
Half		69.2%	*0.15*	84.6%	X	x
Full		76.0%	*0.18*	94.4%	X	x
	PSF Level					
Half		x	X	75.0%	*0.06*	80.8%
Full		x	X	85.2%	*0.13*	98.1%
	NWF Level					
Half		x	X	76.9%	*-0.04*	73.1%
Full		x	X	83.3%	*-0.05*	77.8%
	Tot Comp Level					
Half		78.8%	*-0.08*	71.2%	*0.06*	76.9%
Full		84.0%	*0.03*	87.0%	*-0.04*	83.3%

Table 10 is the boys' means for the four DIBELS Next reading measure scores and total composite scores according to the administration timeline. It is disaggregated by full and half-day kindergarten status. Table 10 also depicts the means of kindergarten boys scoring at benchmark on these four reading measures and the total composite levels. Last, Table 10 provides an illustration of the BOY/MOY mean gains and MOY/EOY mean gains that boys displayed for the four reading measure scores and measure levels along with the total composite scores and composite levels.

Unlike the full-day girls, the percentage of full-day boys in the middle of the year being classified as benchmark decreased 2% from the beginning of the year, whereas half-day boys saw a 1% increase. Another difference with the boys compared to the girls was that the percentage of both full- and half-day boys being identified as benchmark at the end of the year was higher than at the beginning of the year. Half-day boys had a 14% increase in the total composite levels, and full-day boys had a 6% gain.

Although the mean gain for both full-day and half-day boys on Phoneme Segmentation Score at the end of the year compared to the middle of the year was similar (approximately 11 points), it had a different impact on the Phoneme Segmentation Levels. The percentage of full-day boys being identified as benchmark on PSF at the end of the year compared to the middle of the year increased 6% compared to a 3% decrease for half-day boys.

Another difference between the boys and girls was with the Nonsense Word Fluency reading measure. Similar to both full- and half-day girls, the full- and half-day boys had a mean gain on NWF at the end of the year compared to the beginning of the year. As noted earlier, although there was a mean gain in the NWF score, the percentage of full and half-day girls being classified as benchmark on NWF at the end of the year decreased. In contrast, both half-day and full-day boys being classified as NWF benchmark at the end of the year increased from the middle of the year. Half-day boys observed a 13% increase, whereas there was a 8% gain with the full-day kindergarten boys.

Table 10

Descriptive Statistics of Full- and Half-Day Kindergartner Boys on the DIBELS Next

Group	Reading Measure	BOY	BOY/MOY Gain	MOY	MOY/EOY Gain	EOY

	LNF Score					
Half		27.93	*17.15*	45.08	*11.95*	57.03
Full		28.20	*17.74*	45.94	*9.74*	55.68
	FSF Score					
Half		16.14	*25.45*	41.59		
Full		21.05	*22.50*	43.55		
	PSF Score					
Half				35.18	*10.67*	45.85
Full				45.40	*10.88*	56.28
	Tot Comp Score					
Half		44.07	*107.59*	151.66	*3.47*	155.13
Full		49.25	*120.05*	169.29	*-9.82*	159.48
	NWF Score					
Half				29.80	*22.44*	52.24
Full				34.40	*13.12*	47.52
	FSF Level					
Half		69.2%	*0.18*	86.9%		
Full		76.0%	*0.12*	87.7%		
	PSF Level					
Half				86.9%	*-0.03*	83.9%
Full				87.7%	*0.06*	93.8%
	NWF Level					
Half				75.4%	*0.13*	88.7%
Full				81.5%	*0.05*	86.2%
	Tot Comp Level					
Half		72.9%	*0.01*	73.8%	*0.13*	87.1%
Full		80.3%	*-0.02*	78.5%	*0.08*	86.2%

Pairwise comparisons were analyzed at three time points: BOY-MOY, MOY-EOY, and BOY-EOY for all available data. There were two different kinds of data requiring different kinds of analyses. Score data (e.g., BOY_FSF_SCORE) were a continuous variable and were analyzed with ANCOVA. Level data (e.g., BOY_FSF_LEVEL) were originally presented as text data (nominal). The data were converted to an ordinal variable, BOY_FSF_LEVEL2. However, attempts to analyze the level data as ordinal were unsuccessful because all the LEVEL data had sparse cell

frequencies. Therefore, the data were collapsed to two levels called BOY_FSF_LEVEL3. This allowed analysis with logistic regression, which provides results that can be interpreted exactly the same as the ANCOVA results. An example of frequencies documenting the transformations of BOY_FSF_SCORE, 2, and 3 are provided (Appendix H). A secondary analysis was conducted because of comparability issues of the samples. Effect sizes were calculated to quantify the difference between full- and half-day kindergarten. The overall plan of the research findings is as follows:

- Summary and Organization of All Results—Overview of pairwise comparisons, overall findings, and gender analysis
- Comparison of Beginning of the Year Variables—For those variables with BOY data, t tests compare group means
- Significant Comparison Scores—Do full-day students do better on the various DIBELS Next tests than half-day students based on score data?
- Significant Comparison Level—Do full-day students do better on the various DIBELS Next tests than half-day students based on level data?

- Analysis for Significant Gender Scores—Among boys, do full-day students do better than half-day students? Among girls do full-day students do better than half-day students?
- Analysis for Significant Gender Level—Among boys, do full-day students do better than half-day students? Among girls do full-day students do better than half-day students?
- Effect Sizes—What is the magnitude of difference between groups?

Summary and Organization of All Results

The table below shows all the variables in the analyses except GROUP: full/half, and GENDER: male/female. All pairwise comparisons will be examined.

Table 11

Overall DIBELS Next Analyses According to Administration Timeline

BOY	**MOY**	**EOY**
BOY_LNF_SCORE	MOY_LNF_SCORE	EOY_LNF_SCORE
BOY_FSF_SCORE	MOY_FSF_SCORE	
BOY_FSF_LEVEL	MOY_FSF_LEVEL	
BOY_TOT_COMP_SCORE	MOY_TOT_COMP_SCORE	EOY_TOT_COMP_SCORE
BOY_TOT_COMP_LEVEL	MOY_TOT_COMP_LEVEL	EOY_TOT_COMP_LEVEL
	MOY_PSF_SCORE	EOY_PSF_SCORE
	MOY_PSF_LEVEL	EOY_PSF_LEVEL
	MOY_NWF_SCORE	EOY_NWF_SCORE
	MOY_NWF_LEVEL	EOY_NWF_LEVEL

The table below expands the previous table so every possible pairwise comparison is represented, each on a separate row. Only significant comparisons are presented.

Table 12

Overall DIBELS Next Pairwise Comparisons

BOY		**MOY**		**EOY**
BOY_LNF_SCORE	+O	MOY_LNF_SCORE		
BOY_FSF_SCORE	+O	MOY_FSF_SCORE		
BOY_FSF_LEVEL	+O	MOY_FSF_LEVEL		
BOY_TOT_COMP_SCORE	+*	**MOY_TOT_COMP_SCORE**		
BOY_TOT_COMP_LEVEL	+O	MOY_TOT_COMP_LEVEL		
		MOY_LNF_SCORE	+O	EOY_LNF_SCORE
		MOY_TOT_COMP_SCORE	+O	EOY_TOT_COMP_SCORE
		MOY_TOT_COMP_LEVEL	+O	EOY_TOT_COMP_LEVEL
BOY_LNF_SCORE			+O	EOY_LNF_SCORE
BOY_TOT_COMP_SCORE			+O	EOY_TOT_COMP_SCORE
BOY_TOT_COMP_LEVEL			+O	EOY_TOT_COMP_LEVEL
		MOY_PSF_SCORE	+*	**EOY_PSF_SCORE**
		MOY_PSF_LEVEL	+*	**EOY_PSF_LEVEL**
		MOY_NWF_SCORE	-*	**EOY_NWF_SCORE**
		MOY_NWF_LEVEL	+O	EOY_NWF_LEVEL

BOY beginning of year; MOY middle of year; EOY End of year
+ means FULL day higher mean score or percentage at level than HALF day.
- means HALF day higher mean score or percentage at level than FULL day.
* Difference between groups is significant at the .05 level or smaller meaning differences are unlikely to be due to chance.
O Difference between groups is not significant meaning one cannot say differences are unlikely due to chance.

Overall Findings

1. In every comparison except one the full-day class had a higher means score or percentage at grade level than the half day.

2. TOT_COMP_SCORE showed significantly greater gains for the full day over the half day class between the beginning of the year (BOY) and the middle of the year (MOY). However, although the full day still exceeds the half day at the end of the year (EOY), this difference was no longer significant.
3. Between MOY and EOY, there were significant gains for the full day over the half day in two key variables: PSF score and PSF level.
4. Between MOY and EOY, there were very small significant gains for half day over full day in NWF score.

Table 13

Female DIBELS Next

		Gender: Female		
BOY		**MOY**		**EOY**
BOY_LNF_SCORE			+O	EOY_LNF_SCORE
BOY_FSF_SCORE	+O	MOY_FSF_SCORE		
BOY_TOT_COMP_SCORE			+O	EOY_TOT_COMP_SCORE
		MOY_PSF_SCORE	+*	**EOY_PSF_SCORE**
		MOY_NWF_SCORE	+O	EOY_NWF_SCORE
BOY_FSF_LEVEL	+O	MOY_FSF_LEVEL		
BOY_TOT_COMP_LEVEL			+O	EOY_TOT_COMP_LEVEL
		MOY_PSF_LEVEL	+*	**EOY_PSF_LEVEL**
		MOY_NWF_LEVEL	+O	EOY_NWF_LEVEL

Table 14

Male DIBELS Next

		Gender: Male		
BOY		**MOY**		**EOY**
BOY_LNF_SCORE			-O	EOY_LNF_SCORE
BOY_FSF_SCORE	+O	MOY_FSF_SCORE		
BOY_TOT_COMP_SCORE			+O	EOY_TOT_COMP_SCORE
		MOY_PSF_SCORE	+*	**EOY_PSF_SCORE**
		MOY_NWF_SCORE	-*	**EOY_NWF_SCORE**
BOY_FSF_LEVEL	+O	MOY_FSF_LEVEL		
BOY_TOT_COMP_LEVEL			-O	EOY_TOT_COMP_LEVEL
		MOY_PSF_LEVEL	+O	EOY_PSF_LEVEL
		MOY_NWF_LEVEL	-O	EOY_NWF_LEVEL

BOY beginning of year; MOY middle of year; EOY End of year
+ means FULL day higher mean score or percentage at level than HALF day.
- means HALF day higher mean score or percentage at level than FULL day.
* Difference between groups is significant at the .05 level or smaller meaning differences are unlikely to be due to chance.
O Difference between groups is not significant meaning one cannot say differences are unlikely due to chance.

Gender Analysis

The tables above show results for female and male students separately. They do not compare whether one gender did better than the other. There is only one pairwise comparison for each variable in order to limit the number of analyses. In each case, the earliest measure taken was compared to the last measure taken.

1. The general pattern of full day doing better than half day with small, not significant, differences across a large number of variables was seen for each gender.
2. Males showed a significant increase in NWF_SCORE for the half day over the full day from MOY to EOY, while females did not.
3. Both males and females showed a significant increase on PSF_SCORE for the full day over the half day from MOY to EOY.

4. The females, but not the males, showed a significant increase in proportion of students in the full-day class at PSF benchmark over half day.

Comparison of Beginning of the Year Variables

Before beginning the analysis, an examination of the full- and half-day starting scores was important to see if the groups started at the same level.

Table 15

Full- and Half-Day Starting Scores

Starting or BOY scores

	GROUP	*N*	Mean	Std. Deviation	Std. Error Mean
BOY_LNF_SCORE	0 Half	111	26.84	15.953	1.514
	1 Full	111	29.07	16.899	1.604
BOY_FSF_SCORE	0 Half	111	16.50	11.682	1.109
	1 Full	111	20.62	12.163	1.154
BOY_TOT_COMP_SCORE	0 Half	111	43.33	24.260	2.303
	1 Full	111	49.69	26.527	2.518

Table 16

Levene's Test for Equality of Variances

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	*t*	*df*	Sig. (2-tailed)
BOY_LNF_SCORE	Equal variances assumed	.005	.945	-1.013	220	.312
BOY_FSF_SCORE	Equal variances assumed	.055	.814	-2.578	220	.011
BOY_TOT_COMP_SCORE	Equal variances assumed	.721	.397	-1.864	220	.064

The *F* tests for equality of variances was not significant, meaning that the spread of the *t* test values showed only one *t* score, -2.578, had a *p* value smaller than .05 and

therefore was significant. This value of .011 indicated that the means of 16.50 and 20.62 on BOY_FSF_SCORE were significantly different or unlikely to be due to chance. This did not by any means invalidate the use of this score as a covariate in subsequent analyses but is worth noting as unstandardized data. There were issues with comparability of the samples.

Significant Comparison Scores

The following analysis compared BOY Total Composite scores to MOY Total Composite scores between full- and half-day kindergartners.

The *F* test for homogeneity of slope is, again, not significant (*F*=.048; *df*=1,218; *p* =.828), meeting the assumption of the analysis.

Table 17

Descriptive Statistics

Descriptive Statistics

Dependent Variable: MOY_TOT_COMP_SCORE

GROUP	Mean	Std. Deviation	N
0 Half	151.69	52.453	111
1 Full	173.67	52.936	111
Total	162.68	53.716	222

Examination of the means revealed that the full-day group (173) had a 22 point gain over the control group (151). This reflects nearly half a standard deviation.

Table 18

Tests of Between-Subjects Effects

Tests of Between-Subjects Effects

Dependent Variable: MOY_TOT_COMP_SCORE

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	351271.258[a]	2	175635.629	134.297	.000
Intercept	432881.244	1	432881.244	330.996	.000
BOY_TOT_COMP_SCORE	324475.217	1	324475.217	248.105	.000
GROUP	8351.352	1	8351.352	6.386	.012
Error	286411.035	219	1307.813		
Total	6512877.000	222			
Corrected Total	637682.293	221			

a. R Squared = .551 (Adjusted R Squared = .547)

The table above reveals that the group term is significant (F=6.386; df=1,219; p =.012), meaning that the full-day students did significantly better on their MOY TOT COMP SCORE than the control group.

The conclusion was that full-day kindergarten students did significantly better on their MOY Total Composite scores than half-day kindergartners.

The following analysis compared MOY Phoneme Segmentation scores to BOY Phoneme Segmentation scores between fill- and half-day kindergartners.

Not significant (F=1.589; df=1,226; p = .209)

Table 19

Descriptive Statistics

Descriptive Statistics

Dependent Variable: EOY_PSF_SCORE

GROUP	Mean	Std. Deviation	*N*
0 Half	46.59	10.983	111
1 Full	57.39	11.645	119
Total	52.17	12.533	230

There is an 11 point difference between the half- and full-day students, reflecting a full standard deviation.

Table 20

Tests of Between-Subjects Effects

Tests of Between-Subjects Effects

Dependent Variable: EOY_PSF_SCORE

Source	Type III Sum of Squares	*df*	Mean Square	*F*	Sig.
Corrected Model	15518.838[a]	2	7759.419	86.122	.000
Intercept	43307.067	1	43307.067	480.667	.000
MOY_PSF_SCORE	8818.950	1	8818.950	97.882	.000
GROUP	2492.141	1	2492.141	27.660	.000
Error	20452.205	227	90.098		
Total	662058.000	230			
Corrected Total	35971.043	229			

a. *R* Squared = .431 (Adjusted *R* Squared = .426)

The group term is significant (F=27.66; df =1,227; p =.0001), indicating that the full-day students did substantially better at EOY on PSF than the half-day students.

The conclusion revealed that full-day kindergartners' Phoneme Segmentation scores were significantly better than half-day students between MOY and EOY.

The following analysis compared MOY Nonsense Word Fluency scores to EOY Nonsense Word Fluency scores between full and half-day kindergartners.

Table 21

Descriptive Statistics

Descriptive Statistics

Dependent Variable: EOY_NWF_SCORE

GROUP	Mean	Std. Deviation	*N*
0 Half	47.97	28.087	111
1 Full	46.68	26.776	119
Total	47.30	27.364	230

There is a small difference of a little over 1 point with the half-day group doing better than the full-day group.

Table 22

Tests of Between-Subjects Effects

Tests of Between-Subjects Effects

Dependent Variable: EOY_NWF_SCORE

Source	Type III Sum of Squares	*df*	Mean Square	*F*	Sig.
Corrected Model	111231.636[a]	2	55615.818	209.571	.000
Intercept	14182.434	1	14182.434	53.442	.000
MOY_NWF_SCORE	111135.725	1	111135.725	418.781	.000
GROUP	2490.840	1	2490.840	9.386	.002
Error	60241.059	227	265.379		
Total	686144.000	230			
Corrected Total	171472.696	229			

a. *R* Squared = .649 (Adjusted *R* Squared = .646)

The table above shows this very small difference is significant. However, it is significant because of the massive effect for the covariate MOY_MWF_SCORE (F=481.78, df = 1,227, p = .0001). The important finding here is not so much that the half-day students did significantly better than the full-day (F=9.386, df = 1, 227) by a

minuscule amount but rather that MOY scores are better predictors of EOY scores for NWF than for most other variables.

This analysis indicated that half-day students did a tiny bit better on EOY Nonsense Word Fluency than full-day kindergartners. However, the MOY score was a very large predictor of EOY.

Significant Comparison Levels

The following analysis compared level scores of half-day kindergartners with full-day students on Phoneme Segmentation Fluency between MOY and EOY.

Table 23

EOY Phoneme Segmentation Fluency Level 3 Group Crosstabulation

EOY_PSF_LEVEL3 * GROUP Crosstabulation

			GROUP		Total
			0 Half	1 Full	
EOY_PSF_LEVEL3	0 BELOW BENCHMARCK	Count	20	5	25
		% within GROUP	17.5%	4.2%	10.7%
	1 AT BENCHMARK	Count	94	114	208
		% within GROUP	82.5%	95.8%	89.3%
Total		Count	114	119	233
		% within GROUP	100.0%	100.0%	100.0%

On the PSF at EOY, 82.5% of half-day students were at benchmark, whereas 95.8% of full-day students were at benchmark.

Table 24

Omnibus Tests of Model Coefficients

Omnibus Tests of Model Coefficients

		Chi-square	*df*	Sig.
Step 1	Step	24.061	2	.000
	Block	24.061	2	.000
	Model	24.061	2	.000

Chi square is significant, indicating the model fits the data.

Table 25

Variables in the Equation

Variables in the Equation

		B	S.E.	Wald	*df*	Sig.	Exp(B)
Step 1[a]	GROUP(1)	-1.543	.538	8.218	1	.004	.214
	MOY PSF LEVEL3	1.806	.481	14.083	1	.000	6.085
	Constant	1.799	.542	10.998	1	.001	6.041

a. Variable(s) entered on Step 1: GROUP, MOY_PSF_LEVEL3.

The group term is significant (p = .004) indicating that significantly more full-day students were at benchmark.

The analysis above showed more full-day kindergarten students (95.8%) scored at the benchmark level at the EOY than half-day students (82.5%) on Phoneme Segmentation Fluency, and the differences are unlikely to be due to chance.

Analysis for Significant Gender Scores

Table 26

Number of Females and Males

Number of Females and Males

Gender

F Female	*N*	Valid	108
		Missing	0
M Male	*N*	Valid	127
		Missing	0

The following analysis looked at MOY Phoneme Segmentation scores with EOY scores between full- and half-day kindergartners. This analysis separated the males and females.

Table 27

Descriptive Statistics

Descriptive Statistics

Dependent Variable: EOY_PSF_SCORE

Gender	GROUP	Mean	Std. Deviation	*N*
F Female	0 Half	47.38	10.913	50
	1 Full	58.72	9.430	54
	Total	53.27	11.612	104
M Male	0 Half	45.93	11.087	61
	1 Full	56.28	13.177	65
	Total	51.27	13.223	126

Table 28

Tests of Between-Subjects Effects

Tests of Between-Subjects Effects

Dependent Variable: EOY_PSF_SCORE

Gender	Source	Type III Sum of Squares	*df*	Mean Square	*F*	Sig.
	Corrected Model	6678.852[a]	2	3339.426	46.782	.000
	Intercept	22797.505	1	22797.505	319.372	.000
	MOY_PSF_SCORE	3339.004	1	3339.004	46.776	.000
F Female	GROUP	1444.749	1	1444.749	20.240	.000
	Error	7209.610	101	71.382		
	Total	309000.000	104			
	Corrected Total	13888.462	103			
	Corrected Model	8849.130[b]	2	4424.565	41.845	.000
	Intercept	20737.053	1	20737.053	196.118	.000
	MOY_PSF_SCORE	5483.057	1	5483.057	51.855	.000
M Male	GROUP	1082.391	1	1082.391	10.237	.002
	Error	13005.696	123	105.737		
	Total	353058.000	126			
	Corrected Total	21854.825	125			

a. *R* Squared = .481 (Adjusted *R* Squared = .471)

b. *R* Squared = .405 (Adjusted *R* Squared = .395)

The conclusion revealed that both male and female full-day kindergarten students showed a significant difference compared to half-day students on Phoneme Segmentation Fluency from MOY to EOY.

The following analysis looked at MOY Nonsense Word Fluency scores to EOY scores between full- and half-day kindergartners. This analysis separated the males and females.

Table 29

Descriptive Statistics

Descriptive Statistics

Dependent Variable: EOY_NWF_SCORE

Gender	GROUP	Mean	Std. Deviation	*N*
F Female	0 Half	44.48	27.218	50
	1 Full	45.67	24.885	54
	Total	45.10	25.912	104
M Male	0 Half	50.84	28.684	61
	1 Full	47.52	28.416	65
	Total	49.13	28.480	126

Table 30

Tests of Between-Subjects Effects

Tests of Between-Subjects Effects

Dependent Variable: EOY_NWF_SCORE

Gender	Source	Type III Sum of Squares	*df*	Mean Square	*F*	Sig.
F Female	Corrected Model	46007.176[a]	2	23003.588	100.362	.000
	Intercept	3180.631	1	3180.631	13.877	.000
	MOY_NWF_SCORE	45970.617	1	45970.617	200.564	.000
	GROUP	674.629	1	674.629	2.943	.089
	Error	23149.863	101	229.207		
	Total	280658.000	104			
	Corrected Total	69157.038	103			
M Male	Corrected Model	65222.130[b]	2	32611.065	110.904	.000
	Intercept	11810.691	1	11810.691	40.166	.000
	MOY_NWF_SCORE	64876.738	1	64876.738	220.634	.000
	GROUP	1964.341	1	1964.341	6.680	.011
	Error	36167.838	123	294.047		
	Total	405486.000	126			
	Corrected Total	101389.968	125			

a. *R* Squared = .665 (Adjusted R Squared = .659)

b. *R* Squared = .643 (Adjusted *R* Squared = .637)

Although half-day male students in kindergarten had a significant increase in Nonsense Word Fluency scores over the full-day male students from the MOY to EOY, the females did not.

The following analysis compared level scores of half-day kindergartners with full-day students on Phoneme Segmentation Fluency between MOY and EOY. The analysis separated the males and females.

Analysis for Significant Gender Level

Table 31

EOY Phoneme Segmentation Fluency Level 3 Group Crosstabulation

EOY_PSF_LEVEL3 * GROUP Crosstabulation

Gender				GROUP		Total
				0 Half	1 Full	
F Female	EOY_PSF_LEVEL3	0 BELOW BENCHMARCK	Count	10	1	11
			% within GROUP	19.2%	1.9%	10.4%
		1 AT BENCHMARK	Count	42	53	95
			% within GROUP	80.8%	98.1%	89.6%
	Total		Count	52	54	106
			% within GROUP	100.0%	100.0%	100.0%
M Male	EOY_PSF_LEVEL3	0 BELOW BENCHMARCK	Count	10	4	14
			% within GROUP	16.1%	6.2%	11.0%
		1 AT BENCHMARK	Count	52	61	113
			% within GROUP	83.9%	93.8%	89.0%
	Total		Count	62	65	127
			% within GROUP	100.0%	100.0%	100.0%

Table 32

Variables in the Equation

Variables in the Equation

Gender			B	S.E.	Wald	*df*	Sig.	Exp(B)
F Female	Step 1[a]	GROUP	2.365	1.086	4.742	1	.029	10.648
		MOY_PSF_LEVEL3	1.536	.729	4.432	1	.035	4.644
		Constant	.488	.572	.727	1	.394	1.629
M Male	Step 1[a]	GROUP	1.197	.660	3.291	1	.070	3.311
		MOY_PSF_LEVEL3	2.116	.660	10.267	1	.001	8.300
		Constant	-.042	.606	.005	1	.945	.959

a. Variable(s) entered on step 1: GROUP, MOY_PSF_LEVEL3.

Females in the full-day group were at benchmark in 98.1% of cases, while 80.8% of half-day females were. This difference is significant (p =.029). Males in the full-day kindergarten did 10 points better than half-day males (93.9% versus 83.9%). This difference approaches but does not achieve significance (p = .070).

Effect Sizes

A secondary analysis which calculated the effect sizes was done to determine the magnitude of the difference between groups and because of the comparability issues of the samples in the ANCOVA analysis. The effect sizes can sometimes be the main findings in a quantitative study because it helps readers understand the magnitude of differences found, whereas statistical significance examines whether the findings are likely to be due to chance. Both were essential to understand the full impact of the study. The effect sizes were analyzed using the pooled standard deviation of the total composite scores between full- and half-day kindergarten. In addition, effect sizes between genders using pooled standard deviation were computed.

Table 33

Effect Size of Half-Day Kindergarten Using Total Composite Score

DIBELS Next	
64.96	Pooled SD for Half Day
150.10	EOY HD Mean
43.33	BOY HD Mean
106.76	Difference
64.96	Pooled SD for Half Day
1.64	**Effect Size**

Table 34

Effect Size of Full-Day Kindergarten Using Total Composite Score

DIBELS Next	
66.52	Pooled SD for Full Day
161.07	EOY FD Mean
49.69	BOY FD Mean
111.37	Difference
66.52	Pooled SD for Full Day
1.67	**Effect Size**

Table 35

Effect Size of Full-Day Female Kindergarten Students Using Total Composite Score

DIBELS Next	
66.32	Pooled SD for Girls Full Day
162.98	EOY FD Girls Mean
50.24	BOY FD Girls Mean
112.74	Difference
66.31	Pooled SD for Girls Full Day
1.70	**Effect Size**

Table 36

Effect Size of Half-Day Female Kindergarten Students Using Total Composite Score

DIBELS Next	
63.06	Pooled SD for Girls Half Day
144.98	EOY HD Girls Mean
42.57	BOY HD Girls Mean
102.41	Difference
63.059	Pooled SD for Girls Half Day
1.62	**Effect Size**

Table 37

Effect Size of Full-Day Male Kindergarten Students Using Total Composite Scores

DIBELS Next	
66.92	Pooled SD for Males Full Day
159.48	EOY FD Males Mean
49.25	BOY FD Males Mean
110.23	Difference
66.92	Pooled SD for Males Full Day
1.65	**Effect Size**

Table 38

Effect Size of Half-Day Female Kindergarten Students Using Total Composite Scores

DIBELS Next	
66.91	Pooled SD for Males Half Day
155.13	EOY HD Males Mean
44.07	BOY HD Males Mean
111.06	Difference
66.91	Pooled SD for Males Half Day
1.66	**Effect Size**

Both groups demonstrated very large growth from the beginning of the year. In addition, both genders showed large gains. Second, the effect sizes for both groups, including gender, were very similar. This means that half-day kindergarten students grew

as much as the full-day students. This secondary analysis supports the overall finding from the primary analysis.

Summary of Results

The purpose for this study was to investigate the difference, if any, in the reading achievement (for both boys and girls) when receiving full-day kindergarten programming versus half-day programs. Data included results of the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) Next assessment. Reading achievement was defined only from DIBELS Next results. School districts with similar demographic information were used to conduct the study within a similar geographic location in Lehigh County, Pennsylvania. Quantitative research methodology was utilized to gather and analyze data related to the purpose of the study.

There were two different kinds of data requiring different kinds of analysis. Score data were a continuous variable and were analyzed with ANCOVA. Level data were originally presented as nominal data but were converted to ordinal data. Attempts to analyze the level data as ordinal were unsuccessful because all the level data had sparse cell frequencies. Therefore, the data were collapsed to two levels. This allowed analysis with logistic regressions, which provided results which were interpreted the same as the ANCOVA results. The results from the primary analysis were tentative because of comparability issues between the samples.

A secondary analysis which calculated effect sizes was done to determine the magnitude of the difference between groups. The effect sizes were analyzed using the pooled standard deviation of the total composite scores between full- and half-day kindergarten. In addition, effect sizes between genders using pooled standard deviation

were computed. Both groups demonstrated very large growth from the beginning of the year. In addition, both genders showed large gains. Second, the effect sizes for both groups, including gender, were very similar. This means that half-day kindergarten students grew as much as the full-day students.

Overall findings from the data that were collected and analyzed revealed that, although participation in full-day kindergarten had higher mean scores than half-day kindergarten in all but one comparison, only a few DIBELS Next measures showed significant gains for full day over half day. One measure showed very small significant gains for half-day students over full-day students. These findings were similar with the gender comparisons. The general pattern of full-day students doing better than half-day students with small insignificant differences across a large number of variables was seen for both males and females.

The secondary analysis of the effect sizes showed that both groups demonstrated very large growth from the beginning of the year. Both genders also showed large gains. Also, the effect sizes for both groups, including gender, were very similar. This means that half-day kindergarten students grew as much as the full-day students. This secondary analysis supports the overall finding from the primary analysis.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

My purpose for this study was to investigate the difference, if any, in the reading achievement (for both boys and girls) when attending full-day kindergarten versus half-day programs. For this study, DIBELS Next data were collected from two school districts in Lehigh County, Pennsylvania. Reading achievement was defined solely from the DIBELS Next results. District A offered half-day kindergarten, where 111 students participated in the study. District B offered full-day kindergarten, where 119 kindergarten students were in the cohort.

Connections to Research Findings

The findings from this study connect to the research cited in the Literature Review. There is a large body of research that documents academic gains from enrollment in full-day kindergarten compared to half-day. The results for long-term benefits are inconclusive. In addition, research cited in the Literature Review that studied developmentally appropriate full-day kindergarten programs found no harmful effects to students when compared to half-day kindergarten. However, critics of full-day kindergarten programs are cautious whether or not the academic returns are worth the tremendous financial commitment. In addition, the research design of many studies does not allow causal relationships, but rather associations, to be concluded.

The significant gains in phoneme segmentation identified in this study align to research studies that cited gains in reading achievement in full-day kindergarten (Watson & West, 2004; Zvoch, Reynolds, & Parker, 2008; Lee, Burkham, Ready, Honigman, & Meisels, 2006).

Although there were significant gains in the middle of the year Total Composite Score for full-day over half-day programs, the difference was no longer significant at the end of the year. This is similar to the findings of Wolgemuth, Cobb, Winokur, Leech, and Ellerby (2006), in which they revealed that children who attend full-day kindergarten can and do learn more than their half-day counterparts; however, the additional learning declines rapidly (2006). Another study that displayed how full-day kindergarten gains are short-lived was conducted by DeCicca in 2007. DeCicca found no evidence that suggests math and reading proficiency gains as a result of full-day programming extend beyond first grade.

Study Limitations and Possible Impact of Results

Many educators and researchers in the field of literacy express concerns about the sole use of DIBELS to measure reading achievement because it lacks a comprehension measure (Brunsman, 2005). DIBELS has been criticized for exploiting one aspect of reading relevant to the simple views, word recognition, to the exclusion of the other aspect, language comprehension (Munger & Blachman, 2013). The missing piece is what is done with the information yielded from the assessment in these two school districts. DIBELS was specifically designed as an instructional tool to help teachers determine whether a student is developing the skills needed to become a proficient reader (Goodman & Kaminsky, 2002). These findings do not include the degree to which the school districts and respective teachers use DIBELS Next to define reading achievement. Furthermore, as a result of its ease of use, one can understand why a busy teacher and school might opt for the efficiency that the universal screener offers. An important question this study cannot answer is what teachers did differently instructionally once

they knew beginning-of-the-year DIBELS Next data and the degree to which they "teach-to-the-test."

A study's research design determines the quality and strength of evidence and, thus, the confidence we can have in the study's conclusions. Lash, Bae, Barrate, Burr, and Fong (2008) reviewed 299 unduplicated references of literature on full-day kindergarten published in the last decade. The research methodologies used in full-day kindergarten studies leave much to be desired. Only 11 reports described research designs of sufficient rigor. However, none of them used randomized assignment for placing students in a kindergarten program, which would be necessary to establish a causal relationship between program type and academic outcome. The students for this study were not randomized. This study did not control for factors other than the type of kindergarten program used that could affect outcomes. Preexisting differences among the participants, time exposed to literacy development, curriculum, teacher experience, and poverty percentages pose a threat to the validity of this study. This study's findings suggest associations or relationships between attendance in full-day kindergarten and reading achievement but cannot identify reasons or cause for these relationships.

Another limitation of this study was that teachers' perceptions of the advantages and disadvantages of full-day versus half-day were not obtained. Qualitative differences such as teachers' perceptions of the advantages and disadvantages of full-day as compared to half-day kindergarten programs could be examined. Questions and answers centered on pacing, curriculum, differentiation, behavior, assessment, and parent relationships would allow the researcher to describe differences between full-day and half-day programs with regard to instructional methodologies and classroom structures.

One of the most significant weaknesses of the research was the small sample size (*N*=111 and *N*=119). The small sample size does not lend to generalizability, however, it contributes to the body of work on the topic of full and half-day kindergarten.

Recommendations for Policy

Policy makers, state and district education leaders, and school leaders must continue to align education research with education policy. The Education Commission of the States (2005) challenges state policy makers to ensure coherence between kindergarten policies that address children's learning experiences both before and after the kindergarten year. Policy makers at both the state and local level should seek to determine if full-day kindergarten is an effective method of increasing success for children who experience characteristics that place them at risk. In addition, significant diversity in state kindergarten policies demonstrates that children are not receiving equitable early education policies (Workman, 2013). Policy makers should continue to consider these critical decision points regarding kindergarten policy:

- Are students required to attend kindergarten?
- Does the kindergarten funding formula need to be revisited? Does the funding provide incentives to districts to offer full-day?
- Is the length of the kindergarten day providing opportunity for deeper learning? What type of setting to young children learn best in?
- How is readiness for kindergarten defined?
- Are assessments capturing the social, emotional, and academic development of students? Can accountability go beyond standardized tests?
- What is the maximum student/staff ratio?

Unless future kindergarten policy begins to work towards more commonalities, it will continue to be difficult for students to develop similarly. The result will be very different achievement results and the widening of the achievement gap amongst kindergarteners.

Recommendations for Practice

Based upon the analysis and results of this research, kindergarten teachers, administrators, and board members should be made aware of the results of this study. School leaders must continue to provide the necessary support to kindergarten teachers in both full- and half-day kindergarten settings.

The debate of full-day kindergarten versus half-day kindergarten will continue. "Full-day kindergarten is not a magic bullet that will render meaningless all the impediments to school success that struggling students will face" (Cooper, Allen, Patall, & Dent, 2010, p. 67). It should be available to all but not necessarily universally prescribed for all. As a result, it may be best to think of full-day kindergarten as one practice component in the array of interventions parents and educators can use. In the Response to Instruction and Intervention framework, full-day kindergarten could be a Tier 2 or 3 intervention, in which the instruction delivered to students varies on several dimensions that are related to the kind and severity of the student's difficulties.

The current study demonstrates the overreliance of universal screeners as a key measures of reading achievement. Education leaders must continue to use these universal screeners as one mechanism to target students who struggle. Common errors such as false positives and false negatives occur. A false positive is when a student is identified as at risk when he or she is in fact performing at grade level. A false positive is when a

struggling student is overlooked. These universal screeners are starting points and must continue to be used as a formative assessment rather than a summative one. If districts continue to use universal screeners such as DIBELS Next, parallel longer assessments that measure reading achievement should be considered. Reading achievement is more than DIBELS Next results, and benefits from full-day kindergarten should not be measured solely by it.

As districts transition from half-day to full-day kindergarten, school leaders must identify how they will maximize the extra time to increase overall achievement. As a result of this study, investigation of full-day schedules will help school leaders and teachers make the most of the longer school day. One recommendation is to use the extra time to remediate students with the core reading instruction. Both school districts used commercial reading curriculums that possessed scripted instruction designed to accommodate a full-day schedule. The extra time can be devoted to remediation activities to provide at-risk readers additional opportunities to master the content. There is limited time in a half-day program to provide either interventions or enrichment activities. Another recommendation for practice would be to take advantage of the extra time to provide more student-selected activities rather than teacher-directed. Finding a balance between learning and complex play is important in kindergarten. School districts will need to determine whether or not the increased time should be spent teaching more literacy and math using curriculum aligned to the new Common Core standards versus experiential learning, which is grounded in child growth and development research.

Overall Summary

This study illustrated that the early literacy gains on DIBELS Next reading measures for students in full-day kindergarten compared to half-day kindergarteners are questionable. Despite having higher mean scores on the majority of reading measures at the middle and end of the year, only a few showed significance. This can be interpreted to mean that one cannot say it is unlikely the differences are due to chance. These findings were similar for both males and females.

In Conclusion

Prior to beginning this study, I believed that the length of a kindergarten program would have a major influence on reading achievement results when using DIBELS Next. This research revealed that may not be the case. Universal screeners should continue to be only one measure of a student's reading success, and school leaders should not use results as a summative assessment. Benefits of full-day kindergarten should be measured by more than just DIBELS Next results.

There is a strong need for school equality for our early childhood learners. For many, kindergarten is the start of their child's formal education. At the end of this study, I strongly believe more effort towards ensuring kindergarten equity is essential.

Recommendations for Future Research

Future studies of full-day and half-day kindergarten programs could be strengthened by ensuring that the research design guarantees equivalence of the students in the programs being studied. If a study is intended to compare student learning in different kindergarten programs, ideally the students in the programs being compared should be equivalent at entry to kindergarten on all factors that could influence learning

outcomes; age, prior schooling, poverty (Lash, Bae, Barrat, Burr, & Fong, 2008). Thus, studies that use random assignment provide the strongest level of evidence of a causal link between programs and learning. This is of course challenging based on the number of factors involved. Even without randomization, studies could be improved if students were assigned in a manner that ensured academic equivalence of the two groups at the start of kindergarten.

Future qualitative studies should be proposed to explain the differences between kindergarten programs from the perceptions of administrators, teachers, and parents. There is abundant research on full-day kindergarten in terms of academic achievement and behavior. However, what children do in kindergarten may be as, if not more, important than how long they are in school each day. Studies that delve deeper into the perceptions, values, and opinions of those decision makers will help gain a better understanding of the reasons why and how decision makers select half-day or full-day kindergarten for their district.

As a result of the Nonsense Word Fluency and Phoneme Segmentation findings in this study, future research should investigate the degree of importance phonemic awareness has on early literacy development and whether or not DIBELS Next accurately assesses a child's phonemic awareness ability. The National Reading Panel (2000) claims that phonemic awareness training significantly improves a child's reading ability. However, future research to analyze best phonemic awareness practices is important. There has been evidence that reading experience alone, and not phonics instruction, may be the cause of the development of phonemic awareness (Foorman & Francis, 1993). Studies reported no difference in growth in phonemic awareness during Grade 1 between

classes with more or less direct teaching of letter-sound correspondences, and Murray, Stahl, and Ivey (1996), noted gains in phonemic awareness (PA) were seen from storybook reading alone.

Future longitudinal studies should be examined to measure the long term effects of full-day kindergarten versus half-day. Critics discuss how any academic advantages full-day kindergarten provides evaporates in a short period of time. There is less agreement about the degree to which benefits gained from attending full-day kindergarten carry forward throughout the student's academic career (Kauerz, 2005). Future studies can examine whether or not the length of time spent on literacy is more important than the type of kindergarten program.

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Appendix A

Beginning of Year Letter Naming Fluency Scores, First Sound Fluency Scores/Proficiency Levels, and Beginning of Year Total Composite Scores/Proficiency Levels
DIBELS Next
Half-day Kindergarten

Teacher	Gender	BOY-LETTER NAMING FLUENCY (LNF)	BOY-FIRST SOUND FLUENCY (FSF)	BOY-FSF PROFICIENCY LEVEL	BOY-TOTAL COMPOSITE SCORE	BOY-TOTAL COMPOSITE SCORE PROFICIENCY LEVEL
Teacher 1	M	20	33	Benchmark	53	Benchmark
Teacher 1	F	39	17	Benchmark	56	Benchmark
Teacher 1	F	33	26	Benchmark	59	Benchmark
Teacher 1	F	0	0	Well Below Benchmark	0	Well Below Benchmark
Teacher 1	F	31	39	Benchmark	70	Benchmark
Teacher 1	F	13	33	Benchmark	46	Benchmark
Teacher 1	M	40	27	Benchmark	67	Benchmark
Teacher 1	F	18	11	Benchmark	29	Benchmark
Teacher 1	F	32	30	Benchmark	62	Benchmark
Teacher 1	M	71	37	Benchmark	108	Benchmark
Teacher 1	M	42	21	Benchmark	63	Benchmark
Teacher 1	F	29	36	Benchmark	65	Benchmark
Teacher 1	F	21	22	Benchmark	43	Benchmark
Teacher 1	M	11	3	Well Below Benchmark	14	Below Benchmark
Teacher 1	M	42	27	Benchmark	69	Benchmark
Teacher 1	F	31	0	Well Below Benchmark	31	Benchmark
Teacher 1	M	32	33	Benchmark	65	Benchmark
Teacher 1	M	12	7	Below Benchmark	19	Below Benchmark
Teacher 1	F	22	15	Benchmark	37	Benchmark
Teacher 1	F	7	6	Below Benchmark	13	Below Benchmark
Teacher 1	M	28	31	Benchmark	59	Benchmark
Teacher 1	M	43	10	Benchmark	53	Benchmark
Teacher 2	M	20	0	Well Below Benchmark	20	Below Benchmark
Teacher 2	M	6	9	Below Benchmark	15	Below Benchmark
Teacher 2	F	40	39	Benchmark	79	Benchmark
Teacher 2	F	30	2	Well Below Benchmark	32	Benchmark
Teacher 2	M	46	27	Benchmark	73	Benchmark

Teacher 2	M	36	12	Benchmark	48	Benchmark
Teacher 2	M	38	23	Benchmark	61	Benchmark
Teacher 2	M	38	31	Benchmark	69	Benchmark
Teacher 2	M	40	5	Below Benchmark	45	Benchmark
Teacher 2	M	25	21	Benchmark	46	Benchmark
Teacher 2	M	52	18	Benchmark	70	Benchmark
Teacher 2	F	22	17	Benchmark	39	Benchmark
Teacher 2	F	38	20	Benchmark	58	Benchmark
Teacher 2	F	24	18	Benchmark	42	Benchmark
Teacher 2	M	21	29	Benchmark	50	Benchmark
Teacher 2	F	8	2	Well Below Benchmark	10	Well Below Benchmark
Teacher 2	F	20	11	Benchmark	31	Benchmark
Teacher 2	F	32	37	Benchmark	69	Benchmark
Teacher 2	M	10	28	Benchmark	38	Benchmark
Teacher 2	F	57	30	Benchmark	87	Benchmark
Teacher 2	M	25	18	Benchmark	43	Benchmark
Teacher 2	M	50	34	Benchmark	84	Benchmark
Teacher 2	M	35	34	Benchmark	69	Benchmark
Teacher 3	M	27	12	Benchmark	39	Benchmark
Teacher 3	M	18	20	Benchmark	38	Benchmark
Teacher 3	M	16	8	Below Benchmark	24	Below Benchmark
Teacher 3	M	67	14	Benchmark	81	Benchmark
Teacher 3	F	2	4	Well Below Benchmark	6	Well Below Benchmark
Teacher 3	F	22	14	Benchmark	36	Benchmark
Teacher 3	M	38	12	Benchmark	50	Benchmark
Teacher 3	M	43	15	Benchmark	58	Benchmark
Teacher 3	M	9	0	Well Below Benchmark	9	Well Below Benchmark
Teacher 3	M	30	7	Below Benchmark	37	Benchmark
Teacher 3	F	47	0	Well Below Benchmark	47	Benchmark
Teacher 3	M	2	0	Well Below Benchmark	2	Well Below Benchmark
Teacher 3	F	37	26	Benchmark	63	Benchmark
Teacher 3	F	54	28	Benchmark	82	Benchmark
Teacher 3	F	12	15	Benchmark	27	Benchmark
Teacher 3	M	20	10	Benchmark	30	Benchmark
Teacher 3	F	16	0	Well Below Benchmark	16	Below Benchmark
Teacher 3	F	53	22	Benchmark	75	Benchmark
Teacher 4	M	27	31	Benchmark	58	Benchmark
Teacher 4	M					
Teacher 4	M	26	0	Well Below	26	Benchmark

				Benchmark		
Teacher 4	F	21	29	Benchmark	50	Benchmark
Teacher 4	F	51	44	Benchmark	95	Benchmark
Teacher 4	F	10	2	Well Below Benchmark	12	Well Below Benchmark
Teacher 4	M	49	22	Benchmark	71	Benchmark
Teacher 4	M	20	8	Below Benchmark	28	Benchmark
Teacher 4	F	21	4	Well Below Benchmark	25	Below Benchmark
Teacher 4	F	20	18	Benchmark	38	Benchmark
Teacher 4	M	11	0	Well Below Benchmark	11	Well Below Benchmark
Teacher 4	F	28	0	Well Below Benchmark	28	Benchmark
Teacher 4	M	52	32	Benchmark	84	Benchmark
Teacher 4	M					
Teacher 4	F	37	29	Benchmark	66	Benchmark
Teacher 4	M	5	10	Benchmark	15	Below Benchmark
Teacher 4	F	26	0	Well Below Benchmark	26	Benchmark
Teacher 4	F	13	3	Well Below Benchmark	16	Below Benchmark
Teacher 5	F	3	0	Well Below Benchmark	3	Well Below Benchmark
Teacher 5	M	15	4	Well Below Benchmark	19	Below Benchmark
Teacher 5	M	39	19	Benchmark	58	Benchmark
Teacher 5	F	41	19	Benchmark	60	Benchmark
Teacher 5	M	21	22	Benchmark	43	Benchmark
Teacher 5	F	23	25	Benchmark	48	Benchmark
Teacher 5	F	39	17	Benchmark	56	Benchmark
Teacher 5	M	51	20	Benchmark	71	Benchmark
Teacher 5	F					
Teacher 5	M	32	18	Benchmark	50	Benchmark
Teacher 5	F	22	17	Benchmark	39	Benchmark
Teacher 5	M	28	9	Below Benchmark	37	Benchmark
Teacher 5	M	70	29	Benchmark	99	Benchmark
Teacher 5	M	18	16	Benchmark	34	Benchmark
Teacher 5	F	11	33	Benchmark	44	Benchmark
Teacher 5	M	7	5	Below Benchmark	12	Well Below Benchmark
Teacher 5	F	46	24	Benchmark	70	Benchmark
Teacher 6	M	21	17	Benchmark	38	Benchmark
Teacher 6	M	12	14	Benchmark	26	Benchmark
Teacher 6	F	19	28	Benchmark	47	Benchmark
Teacher 6	M	37	16	Benchmark	53	Benchmark

Teacher 6	F	16	16	Benchmark	32	Benchmark
Teacher 6	F	25	15	Benchmark	40	Benchmark
Teacher 6	M					
Teacher 6	F					
Teacher 6	F	7	4	Well Below Benchmark	11	Well Below Benchmark
Teacher 6	M	6	9	Below Benchmark	15	Below Benchmark
Teacher 6	F	3	2	Well Below Benchmark	5	Well Below Benchmark
Teacher 6	M	31	24	Benchmark	55	Benchmark
Teacher 6	F	20	17	Benchmark	37	Benchmark
Teacher 6	F	39	13	Benchmark	52	Benchmark
Teacher 6	M	4	0	Well Below Benchmark	4	Well Below Benchmark
Teacher 6	M	2	0	Well Below Benchmark	2	Well Below Benchmark
Teacher 6	M	7	11	Benchmark	18	Below Benchmark
Teacher 6	M	4	0	Well Below Benchmark	4	Well Below Benchmark

Appendix B

Beginning of Year Letter Naming Fluency Scores, First Sound Fluency Scores/Proficiency Levels, and Beginning of Year Total Composite Scores/Proficiency Levels
DIBELS Next
Full-day Kindergarten

Teacher	Gender	BOY-LETTER NAMING FLUENCY (LNF)	BOY-FIRST SOUND FLUENCY (FSF)	BOY-FSF PROFICIENCY LEVEL	BOY-TOTAL COMPOSITE SCORE	BOY-TOTAL COMPOSITE SCORE PROFICIENCY LEVEL
Teacher 1	M	61	28	Benchmark	89	Benchmark
Teacher 1	M	22	28	Benchmark	50	Benchmark
Teacher 1	M	54	33	Benchmark	87	Benchmark
Teacher 1	M	4	0	Below Benchmark	4	Below Benchmark
Teacher 1	F	50	40	Benchmark	90	Benchmark
Teacher 1	F	18	10	Benchmark	28	Benchmark
Teacher 1	M	40	20	Benchmark	60	Benchmark
Teacher 1	F	28	26	Benchmark	54	Benchmark
Teacher 1	M	24	7	Well Below Benchmark Benchmark	31	Benchmark
Teacher 1	M	56	37	Benchmark	93	Benchmark
Teacher 1	F	27	29	Benchmark	56	Benchmark
Teacher 1	F	38	32	Benchmark	70	Benchmark
Teacher 1	M	28	10	Benchmark	38	Benchmark
Teacher 1	F	23	4	Below Benchmark	27	Benchmark
Teacher 1	F	34	23	Benchmark	57	Benchmark
Teacher 1	M	37	0	Below Benchmark	37	Benchmark
Teacher 1	M	27	38	Benchmark	65	Benchmark
Teacher 1	M	16	18	Benchmark	34	Benchmark
Teacher 1	M					
Teacher 2	M	19	7	Well Below Benchmark Benchmark	26	Benchmark
Teacher 2	M	33	30	Benchmark	63	Benchmark
Teacher 2	M	34	38	Benchmark	72	Benchmark
Teacher 2	F	0	16	Benchmark	16	Well Below Benchmark Benchmark
Teacher 2	M	13	12	Benchmark	25	Well Below Benchmark Benchmark

Teacher 2	M	27	15	Benchmark	42	Benchmark
Teacher 2	M	6	2	Below Benchmark	8	Below Benchmark
Teacher 2	F	6	1	Below Benchmark	7	Below Benchmark
Teacher 2	M	30	15	Benchmark	45	Benchmark
Teacher 2	F	17	12	Benchmark	29	Benchmark
Teacher 2	F	27	15	Benchmark	42	Benchmark
Teacher 2	F	18	2	Below Benchmark	20	Well Below Benchmark Benchmark
Teacher 2	M	3	12	Benchmark	15	Well Below Benchmark Benchmark
Teacher 2	F	29	34	Benchmark	63	Benchmark
Teacher 2	F					
Teacher 2	F	31	5	Well Below Benchmark Benchmark	36	Benchmark
Teacher 2	M	73	35	Benchmark	108	Benchmark
Teacher 2	M	25	39	Benchmark	64	Benchmark
Teacher 2	M	37	24	Benchmark	61	Benchmark
Teacher 2	F	36	13	Benchmark	49	Benchmark
Teacher 3	F	32	28	Benchmark	60	Benchmark
Teacher 3	F	30	5	Well Below Benchmark Benchmark	35	Benchmark
Teacher 3	M	33	22	Benchmark	55	Benchmark
Teacher 3	M	0	0	Below Benchmark	0	Below Benchmark
Teacher 3	M	37	26	Benchmark	63	Benchmark
Teacher 3	M	43	40	Benchmark	83	Benchmark
Teacher 3	F	27	28	Benchmark	55	Benchmark
Teacher 3	F	41	22	Benchmark	63	Benchmark
Teacher 3	M	24	21	Benchmark	45	Benchmark
Teacher 3	M	38	27	Benchmark	65	Benchmark
Teacher 3	M	8	9	Well Below Benchmark Benchmark	17	Well Below Benchmark Benchmark
Teacher 3	M	27	22	Benchmark	49	Benchmark
Teacher 3	M	42	22	Benchmark	64	Benchmark
Teacher 3	F	5	4	Below Benchmark	9	Below Benchmark
Teacher 3	F	25	16	Benchmark	41	Benchmark
Teacher 3	F	55	27	Benchmark	82	Benchmark
Teacher 3	M	14	15	Benchmark	29	Benchmark
Teacher 3	M	45	33	Benchmark	78	Benchmark
Teacher 4	F	61	30	Benchmark	91	Benchmark
Teacher 4	F	14	19	Benchmark	33	Benchmark

Teacher 4	M	22	23	Benchmark	45	Benchmark
Teacher 4	M	1	0	Below Benchmark	1	Below Benchmark
Teacher 4	M	39	23	Benchmark	62	Benchmark
Teacher 4	F	7	2	Below Benchmark	9	Below Benchmark
Teacher 4	M	34	54	Benchmark	88	Benchmark
Teacher 4	F	55	37	Benchmark	92	Benchmark
Teacher 4	M	13	9	Well Below Benchmark Benchmark	22	Well Below Benchmark Benchmark
Teacher 4	F					
Teacher 4	F	29	24	Benchmark	53	Benchmark
Teacher 4	F	25	21	Benchmark	46	Benchmark
Teacher 4	F	10	26	Benchmark	36	Benchmark
Teacher 4	M	1	0	Below Benchmark	1	Below Benchmark
Teacher 4	M	17	12	Benchmark	29	Benchmark
Teacher 4	M	11	21	Benchmark	32	Benchmark
Teacher 4	M					
Teacher 4	F	27	0	Below Benchmark	27	Benchmark
Teacher 4	M	40	37	Benchmark	77	Benchmark
Teacher 4	F	43	21	Benchmark	64	Benchmark
Teacher 5	M	14	27	Benchmark	41	Benchmark
Teacher 5	F	40	38	Benchmark	78	Benchmark
Teacher 5	M	37	37	Benchmark	74	Benchmark
Teacher 5	M	21	14	Benchmark	35	Benchmark
Teacher 5	M	39	26	Benchmark	65	Benchmark
Teacher 5	M	22	25	Benchmark	47	Benchmark
Teacher 5	F					
Teacher 5	F	44	25	Benchmark	69	Benchmark
Teacher 5	F					
Teacher 5	M					
Teacher 5	F	23	28	Benchmark	51	Benchmark
Teacher 5	M	20	11	Benchmark	31	Benchmark
Teacher 5	M	64	37	Benchmark	101	Benchmark
Teacher 5	M	81	50	Benchmark	131	Benchmark
Teacher 5	M	17	17	Benchmark	34	Benchmark
Teacher 5	F	21	33	Benchmark	54	Benchmark
Teacher 5	F	32	28	Benchmark	60	Benchmark
Teacher 5	F	27	27	Benchmark	54	Benchmark
Teacher 5	F	57	20	Benchmark	77	Benchmark
Teacher 5	F	35	30	Benchmark	65	Benchmark
Teacher 5	F	21	26	Benchmark	47	Benchmark
Teacher 5	M	15	6	Well Below Benchmark	21	Well Below Benchmark

				Benchmark		Benchmark
Teacher 6	M	38	27	Benchmark	65	Benchmark
Teacher 6	F	41	28	Benchmark	69	Benchmark
Teacher 6	F	44	30	Benchmark	74	Benchmark
Teacher 6	F	5	9	Well Below Benchmark Benchmark	14	Well Below Benchmark Benchmark
Teacher 6	M	23	20	Benchmark	43	Benchmark
Teacher 6	F	54	28	Benchmark	82	Benchmark
Teacher 6	M	28	14	Benchmark	42	Benchmark
Teacher 6	F	4	0	Below Benchmark	4	Below Benchmark
Teacher 6	M	28	30	Benchmark	58	Benchmark
Teacher 6	M					
Teacher 6	M	5	12	Benchmark	17	Well Below Benchmark Benchmark
Teacher 6	M	25	18	Benchmark	43	Benchmark
Teacher 6	F	70	30	Benchmark	100	Benchmark
Teacher 6	F	25	6	Well Below Benchmark Benchmark	31	Benchmark
Teacher 6	F	21	22	Benchmark	43	Benchmark
Teacher 6	M	30	28	Benchmark	58	Benchmark
Teacher 6	M	5	0	Below Benchmark	5	Below Benchmark
Teacher 6	F	55	23	Benchmark	78	Benchmark
Teacher 6	F	20	2	Below Benchmark	22	Well Below Benchmark Benchmark
Teacher 6	M	50	21	Benchmark	71	Benchmark

Appendix C

Middle of Year Letter Naming Fluency Scores, First Sound Fluency Scores/Proficiency Levels, Middle of Year Phoneme Segmentation Fluency Scores/Proficiency Levels, Middle of Year Nonsense Word Fluency Scores/Proficiency Levels, and Middle of Year Total Composite Scores/Proficiency Levels
DIBELS Next
Half-day Kindergarten

Teacher	Gender	MOY-LETTER NAMING FLUENCY (LNF)	MOY-FIRST SOUND FLUENCY (FSF)	MOY-FSF PROFICIENCY LEVEL	MOY-PHONEME SEGMENTATION FLUENCY (PSF)	MOY-PSF PROFICIENCY LEVEL	MOY-NONSENSE WORD FLUENCY (NWF) CORRECT LETTER SOUNDS	MOY-NWF PROFICIENCY LEVEL	MOY-TOTAL COMPOSITE SCORE	MOY-TOTAL COMPOSITE SCORE PROFICIENCY LEVEL
Teacher 1	M	35	44	Benchmark	56	Benchmark	21	Benchmark	156	Benchmark
Teacher 1	F	60	38	Benchmark	43	Benchmark	40	Benchmark	181	Benchmark
Teacher 1	F	35	35	Benchmark	40	Benchmark	17	Benchmark	127	Benchmark
Teacher 1	F	0	0	Well Below Benchmark	0	Well Below Benchmark	0	Well Below Benchmark	0	Well Below Benchmark
Teacher 1	F	48	41	Benchmark	55	Benchmark	24	Benchmark	168	Benchmark
Teacher 1	F	23	41	Benchmark	40	Benchmark	15	Below Benchmark	119	Below Benchmark
Teacher 1	M	43	42	Benchmark	34	Benchmark	15	Below Benchmark	134	Benchmark
Teacher 1	F	24	28	Below Benchmark	11	Below Benchmark	6	Well Below Benchmark	69	Well Below Benchmark
Teacher 1	F	58	49	Benchmark	55	Benchmark	34	Benchmark	196	Benchmark
Teacher 1	M	79	41	Benchmark	46	Benchmark	103	Benchmark	269	Benchmark
Teacher 1	M	52	36	Benchmark	33	Benchmark	29	Benchmark	150	Benchmark
Teacher 1	F	51	40	Benchmark	12	Below Benchmark	29	Benchmark	132	Benchmark
Teacher 1	F	61	45	Benchmark	56	Benchmark	19	Benchmark	181	Benchmark
Teacher 1	M	26	32	Benchmark	8	Well Below Benchmark	11	Below Benchmark	77	Well Below Benchmark
Teacher 1	M	59	42	Benchmark	49	Benchmark	83	Benchmark	233	Benchmark
Teacher 1	F	35	21	Below Benchmark	12	Below Benchmark	11	Below Benchmark	79	Well Below Benchmark
Teacher 1	M	49	44	Benchmark	56	Benchmark	17	Benchmark	166	Benchmark
Teacher 1	M	31	32	Benchmark	22	Benchmark	10	Below Benchmark	95	Below Benchmark
Teacher 1	F	36	42	Benchmark	49	Benchmark	14	Below Benchmark	141	Benchmark
Teacher 1	F	27	32	Benchmark	13	Below Benchmark	8	Below Benchmark	80	Well Below Benchmark
Teacher 1	M	45	49	Benchmark	40	Benchmark	37	Benchmark	171	Benchmark
Teacher 1	M	39	46	Benchmark	47	Benchmark	23	Benchmark	155	Benchmark
Teacher 2	M	43	27	Below Benchmark	11	Below Benchmark	7	Well Below Benchmark	88	Below Benchmark
Teacher 2	M	19	45	Benchmark	24	Benchmark	10	Below Benchmark	98	Below Benchmark
Teacher 2	F	38	49	Benchmark	21	Benchmark	8	Below	116	Below

								Benchmark		Benchmark
Teacher 2	F	49	50	Benchmark	16	Below Benchmark	21	Benchmark	136	Benchmark
Teacher 2	M	54	32	Benchmark	33	Benchmark	29	Benchmark	148	Benchmark
Teacher 2	M	56	27	Below Benchmark	20	Benchmark	13	Below Benchmark	116	Below Benchmark
Teacher 2	M	46	33	Benchmark	45	Benchmark	26	Benchmark	150	Benchmark
Teacher 2	M	58	52	Benchmark	53	Benchmark	44	Benchmark	207	Benchmark
Teacher 2	M	49	46	Benchmark	18	Below Benchmark	20	Benchmark	133	Benchmark
Teacher 2	M	41	51	Benchmark	45	Benchmark	35	Benchmark	172	Benchmark
Teacher 2	M	62	46	Benchmark	33	Benchmark	45	Benchmark	186	Benchmark
Teacher 2	F	36	44	Benchmark	25	Benchmark	13	Below Benchmark	118	Below Benchmark
Teacher 2	F	63	49	Benchmark	58	Benchmark	43	Benchmark	213	Benchmark
Teacher 2	F	40	41	Benchmark	44	Benchmark	25	Benchmark	150	Benchmark
Teacher 2	M	54	44	Benchmark	47	Benchmark	29	Benchmark	174	Benchmark
Teacher 2	F	24	43	Benchmark	19	Below Benchmark	11	Below Benchmark	97	Below Benchmark
Teacher 2	F	43	25	Below Benchmark	34	Benchmark	9	Below Benchmark	111	Below Benchmark
Teacher 2	F	53	48	Benchmark	53	Benchmark	53	Benchmark	207	Benchmark
Teacher 2	M	26	39	Benchmark	26	Benchmark	15	Below Benchmark	106	Below Benchmark
Teacher 2	F	92	51	Benchmark	70	Benchmark	55	Benchmark	268	Benchmark
Teacher 2	M	37	36	Benchmark	44	Benchmark	24	Benchmark	141	Benchmark
Teacher 2	M	67	45	Benchmark	42	Benchmark	70	Benchmark	224	Benchmark
Teacher 2	M	57	46	Benchmark	40	Benchmark	31	Benchmark	174	Benchmark
Teacher 3	M	51	26	Below Benchmark	46	Benchmark	42	Benchmark	165	Benchmark
Teacher 3	M	44	31	Benchmark	33	Benchmark	26	Benchmark	134	Benchmark
Teacher 3	M	28	37	Benchmark	36	Benchmark	19	Benchmark	120	Below Benchmark
Teacher 3	M	74	39	Benchmark	15	Below Benchmark	37	Benchmark	165	Benchmark
Teacher 3	F	16	34	Benchmark	11	Below Benchmark	11	Below Benchmark	72	Well Below Benchmark
Teacher 3	F	38	44	Benchmark	47	Benchmark	21	Benchmark	150	Benchmark
Teacher 3	M	41	25	Below Benchmark	43	Benchmark	26	Benchmark	135	Benchmark
Teacher 3	M	52	52	Benchmark	46	Benchmark	59	Benchmark	209	Benchmark
Teacher 3	M	40	54	Benchmark	36	Benchmark	27	Benchmark	157	Benchmark
Teacher 3	M	38	36	Benchmark	20	Benchmark	25	Benchmark	119	Below Benchmark
Teacher 3	F	55	52	Benchmark	43	Benchmark	37	Benchmark	187	Benchmark
Teacher 3	M	26	18	Well Below Benchmark	11	Below Benchmark	15	Below Benchmark	70	Well Below Benchmark
Teacher 3	F	66	45	Benchmark	48	Benchmark	25	Benchmark	184	Benchmark
Teacher 3	F	68	46	Benchmark	39	Benchmark	61	Benchmark	214	Benchmark
Teacher 3	F	50	40	Benchmark	41	Benchmark	17	Benchmark	148	Benchmark
Teacher 3	M	39	40	Benchmark	36	Benchmark	17	Benchmark	132	Benchmark
Teacher 3	F	25	24	Below Benchmark	11	Below Benchmark	17	Benchmark	77	Well Below Benchmark
Teacher 3	F	80	40	Benchmark	47	Benchmark	49	Benchmark	216	Benchmark
Teacher 4	M	59	60	Benchmark	46	Benchmark	64	Benchmark	229	Benchmark

Teacher 4	M	45	50	Benchmark	41	Benchmark	26	Benchmark	162	Benchmark
Teacher 4	M	46	48	Benchmark	26	Benchmark	37	Benchmark	157	Benchmark
Teacher 4	F	40	51	Benchmark	50	Benchmark	24	Benchmark	165	Benchmark
Teacher 4	F	72	58	Benchmark	58	Benchmark	36	Benchmark	224	Benchmark
Teacher 4	F	28	46	Benchmark	46	Benchmark	26	Benchmark	146	Benchmark
Teacher 4	M	54	45	Benchmark	46	Benchmark	45	Benchmark	190	Benchmark
Teacher 4	M	49	38	Benchmark	33	Benchmark	18	Benchmark	138	Benchmark
Teacher 4	F	62	54	Benchmark	36	Benchmark	48	Benchmark	200	Benchmark
Teacher 4	F	47	42	Benchmark	44	Benchmark	44	Benchmark	177	Benchmark
Teacher 4	M	40	56	Benchmark	46	Benchmark	27	Benchmark	169	Benchmark
Teacher 4	F	30	26	Below Benchmark	14	Below Benchmark	19	Benchmark	89	Below Benchmark
Teacher 4	M	74	54	Benchmark	55	Benchmark	127	Benchmark	310	Benchmark
Teacher 4	M									
Teacher 4	F	45	47	Benchmark	58	Benchmark	29	Benchmark	179	Benchmark
Teacher 4	M	18	46	Benchmark	27	Benchmark	26	Benchmark	117	Below Benchmark
Teacher 4	F	57	44	Benchmark	27	Benchmark	31	Benchmark	159	Benchmark
Teacher 4	F	29	0	Well Below Benchmark	0	Well Below Benchmark	0	Well Below Benchmark	29	Well Below Benchmark
Teacher 5	F	36	52	Benchmark	21	Benchmark	28	Benchmark	137	Benchmark
Teacher 5	M	25	42	Benchmark	37	Benchmark	9	Below Benchmark	113	Below Benchmark
Teacher 5	M	63	52	Benchmark	33	Benchmark	21	Benchmark	169	Benchmark
Teacher 5	F	73	56	Benchmark	50	Benchmark	124	Benchmark	303	Benchmark
Teacher 5	M	27	24	Below Benchmark	30	Benchmark	17	Benchmark	98	Below Benchmark
Teacher 5	F	47	38	Benchmark	35	Benchmark	28	Benchmark	148	Benchmark
Teacher 5	F	46	43	Benchmark	41	Benchmark	38	Benchmark	168	Benchmark
Teacher 5	M	68	34	Benchmark	30	Benchmark	23	Benchmark	155	Benchmark
Teacher 5	F									
Teacher 5	M	58	40	Benchmark	51	Benchmark	36	Benchmark	185	Benchmark
Teacher 5	F	26	26	Below Benchmark	11	Below Benchmark	25	Benchmark	88	Below Benchmark
Teacher 5	M	46	51	Benchmark	50	Benchmark	25	Benchmark	172	Benchmark
Teacher 5	M	78	52	Benchmark	47	Benchmark	46	Benchmark	223	Benchmark
Teacher 5	M	47	48	Benchmark	47	Benchmark	21	Benchmark	163	Benchmark
Teacher 5	F	51	60	Benchmark	42	Benchmark	40	Benchmark	193	Benchmark
Teacher 5	M	20	43	Benchmark	25	Benchmark	11	Below Benchmark	99	Below Benchmark
Teacher 5	F	71	38	Benchmark	36	Benchmark	53	Benchmark	198	Benchmark
Teacher 6	M	40	50	Benchmark	36	Benchmark	38	Benchmark	164	Benchmark
Teacher 6	M	59	55	Benchmark	46	Benchmark	46	Benchmark	206	Benchmark
Teacher 6	F	56	46	Benchmark	32	Benchmark	20	Benchmark	154	Benchmark
Teacher 6	M	62	40	Benchmark	26	Benchmark	20	Benchmark	148	Benchmark
Teacher 6	F	41	42	Benchmark	49	Benchmark	24	Benchmark	156	Benchmark
Teacher 6	F	46	49	Benchmark	45	Benchmark	34	Benchmark	174	Benchmark
Teacher 6	M	44	24	Below Benchmark	5	Well Below Benchmark	5	Well Below Benchmark	78	Well Below Benchmark
Teacher 6	F									

Teacher 6	F	34	58	Benchmark	47	Benchmark	17	Benchmark	156	Benchmark
Teacher 6	M	35	60	Benchmark	44	Benchmark	12	Below Benchmark	151	Benchmark
Teacher 6	F	31	52	Benchmark	13	Below Benchmark	23	Benchmark	119	Below Benchmark
Teacher 6	M	51	38	Benchmark	41	Benchmark	16	Below Benchmark	146	Benchmark
Teacher 6	F	39	44	Benchmark	53	Benchmark	20	Benchmark	156	Benchmark
Teacher 6	F	54	50	Benchmark	41	Benchmark	27	Benchmark	172	Benchmark
Teacher 6	M	4	4	Well Below Benchmark	0	Well Below Benchmark	1	Well Below Benchmark	9	Well Below Benchmark
Teacher 6	M	35	58	Benchmark	42	Benchmark	23	Benchmark	158	Benchmark
Teacher 6	M	26	58	Benchmark	31	Benchmark	34	Benchmark	149	Benchmark
Teacher 6	M	17	32	Benchmark	11	Below Benchmark	4	Well Below Benchmark	64	Well Below Benchmark

Appendix D

Middle of Year Letter Naming Fluency Scores, First Sound Fluency Scores/Proficiency Levels, Middle of Year Phoneme Segmentation Fluency Scores/Proficiency Levels, Middle of Year Nonsense Word Fluency Scores/Proficiency Levels, and Middle of Year Total Composite Scores/Proficiency Levels
DIBELS Next
Full-day Kindergarten

Teacher	Gender	MOY-LETTER NAMING FLUENCY (LNF)	MOY-FIRST SOUND FLUENCY (FSF)	MOY-FSF PROFICIENCY LEVEL	MOY-PHONEME SEGMENTATION FLUENCY (PSF)	MOY-PSF PROFICIENCY LEVEL	MOY-NONSENSE WORD FLUENCY (NWF) CORRECT LETTER SOUNDS	MOY-NWF PROFICIENCY LEVEL	MOY-TOTAL COMPOSITE SCORE	MOY-TOTAL COMPOSITE SCORE PROFICIENCY LEVEL
Teacher 1	M	52	56	Benchmark	42	Benchmark	28	Benchmark	178	Benchmark
Teacher 1	M	47	42	Benchmark	51	Benchmark	23	Benchmark	163	Benchmark
Teacher 1	M	70	58	Benchmark	56	Benchmark	40	Benchmark	224	Benchmark
Teacher 1	M	40	49	Benchmark	5	Below Benchmark	23	Benchmark	117	Well Below Benchmark Benchmark
Teacher 1	F	64	48	Benchmark	41	Benchmark	63	Benchmark	216	Benchmark
Teacher 1	F	32	38	Benchmark	54	Benchmark	21	Benchmark	145	Benchmark
Teacher 1	M	43	32	Benchmark	46	Benchmark	35	Benchmark	156	Benchmark
Teacher 1	F	53	51	Benchmark	45	Benchmark	44	Benchmark	193	Benchmark
Teacher 1	M	34	45	Benchmark	4	Below Benchmark	9	Well Below Benchmark Benchmark	92	Well Below Benchmark Benchmark
Teacher 1	M	69	58	Benchmark	50	Benchmark	45	Benchmark	222	Benchmark
Teacher 1	F	40	45	Benchmark	42	Benchmark	22	Benchmark	149	Benchmark
Teacher 1	F	42	48	Benchmark	58	Benchmark	38	Benchmark	186	Benchmark
Teacher 1	M	54	36	Benchmark	52	Benchmark	34	Benchmark	176	Benchmark
Teacher 1	F	43	53	Benchmark	15	Well Below Benchmark Benchmark	23	Benchmark	134	Benchmark
Teacher 1	F	58	42	Benchmark	58	Benchmark	27	Benchmark	185	Benchmark
Teacher 1	M	60	38	Benchmark	46	Benchmark	39	Benchmark	183	Benchmark
Teacher 1	M	36	44	Benchmark	46	Benchmark	29	Benchmark	155	Benchmark
Teacher 1	M	69	54	Benchmark	57	Benchmark	54	Benchmark	234	Benchmark
Teacher 1	M	39	32	Benchmark	8	Below Benchmark	14	Well Below Benchmark Benchmark	93	Well Below Benchmark Benchmark
Teacher 2	M	30	30	Benchmark	26	Benchmark	20	Benchmark	106	Well Below Benchmark Benchmark
Teacher 2	M	66	49	Benchmark	36	Benchmark	56	Benchmark	207	Benchmark
Teacher 2	M	42	42	Benchmark	42	Benchmark	29	Benchmark	155	Benchmark
Teacher 2	F	15	35	Benchmark	8	Below Benchmark	12	Well Below Benchmark Benchmark	70	Below Benchmark
Teacher 2	M	48	26	Well Below	7	Below	19	Benchmark	100	Well Below

				Benchmark Benchmark		Benchmark				Benchmark Benchmark
Teacher 2	M	65	27	Well Below Benchmark Benchmark	44	Benchmark	27	Benchmark	163	Benchmark
Teacher 2	M	18	36	Benchmark	9	Below Benchmark	9	Well Below Benchmark Benchmark	72	Below Benchmark
Teacher 2	F	31	24	Well Below Benchmark Benchmark	9	Below Benchmark	15	Well Below Benchmark Benchmark	79	Below Benchmark
Teacher 2	M	36	53	Benchmark	52	Benchmark	34	Benchmark	175	Benchmark
Teacher 2	F	42	30	Benchmark	47	Benchmark	25	Benchmark	144	Benchmark
Teacher 2	F	48	48	Benchmark	66	Benchmark	34	Benchmark	196	Benchmark
Teacher 2	F	24	37	Benchmark	14	Well Below Benchmark Benchmark	15	Well Below Benchmark Benchmark	90	Well Below Benchmark Benchmark
Teacher 2	M	39	38	Benchmark	29	Benchmark	20	Benchmark	126	Benchmark
Teacher 2	F	43	48	Benchmark	43	Benchmark	31	Benchmark	165	Benchmark
Teacher 2	F	73	53	Benchmark	50	Benchmark	40	Benchmark	216	Benchmark
Teacher 2	F	38	44	Benchmark	15	Well Below Benchmark Benchmark	37	Benchmark	134	Benchmark
Teacher 2	M	81	44	Benchmark	41	Benchmark	59	Benchmark	225	Benchmark
Teacher 2	M	61	54	Benchmark	30	Benchmark	31	Benchmark	176	Benchmark
Teacher 2	M	41	36	Benchmark	31	Benchmark	24	Benchmark	132	Benchmark
Teacher 2	F	49	46	Benchmark	47	Benchmark	27	Benchmark	169	Benchmark
Teacher 3	F	54	48	Benchmark	45	Benchmark	31	Benchmark	178	Benchmark
Teacher 3	F	57	52	Benchmark	49	Benchmark	42	Benchmark	200	Benchmark
Teacher 3	M	56	60	Benchmark	62	Benchmark	62	Benchmark	240	Benchmark
Teacher 3	M	12	0	Below Benchmark	0	Below Benchmark	0	Below Benchmark	12	Below Benchmark
Teacher 3	M	64	54	Benchmark	65	Benchmark	44	Benchmark	227	Benchmark
Teacher 3	M	50	56	Benchmark	67	Benchmark	40	Benchmark	213	Benchmark
Teacher 3	F	45	54	Benchmark	63	Benchmark	32	Benchmark	194	Benchmark
Teacher 3	F	71	55	Benchmark	64	Benchmark	39	Benchmark	229	Benchmark
Teacher 3	M	53	54	Benchmark	64	Benchmark	51	Benchmark	222	Benchmark
Teacher 3	M	41	48	Benchmark	50	Benchmark	43	Benchmark	182	Benchmark
Teacher 3	M	56	44	Benchmark	21	Benchmark	40	Benchmark	161	Benchmark
Teacher 3	M	35	57	Benchmark	60	Benchmark	33	Benchmark	185	Benchmark
Teacher 3	M	50	44	Benchmark	58	Benchmark	42	Benchmark	194	Benchmark
Teacher 3	F	22	48	Benchmark	50	Benchmark	22	Benchmark	142	Benchmark
Teacher 3	F	42	46	Benchmark	50	Benchmark	42	Benchmark	180	Benchmark
Teacher 3	F	62	60	Benchmark	62	Benchmark	35	Benchmark	219	Benchmark
Teacher 3	M	37	54	Benchmark	64	Benchmark	28	Benchmark	183	Benchmark
Teacher 3	M	69	60	Benchmark	70	Benchmark	49	Benchmark	248	Benchmark
Teacher 4	F	96	53	Benchmark	36	Benchmark	57	Benchmark	242	Benchmark
Teacher 4	F	39	26	Well Below Benchmark Benchmark	5	Below Benchmark	16	Well Below Benchmark Benchmark	86	Well Below Benchmark Benchmark
Teacher 4	M	45	40	Benchmark	41	Benchmark	33	Benchmark	159	Benchmark
Teacher 4	M	4	20	Well Below Benchmark	19	Well Below Benchmark	6	Below Benchmark	49	Below Benchmark

				Benchmark		Benchmark				
Teacher 4	M	52	46	Benchmark	53	Benchmark	33	Benchmark	184	Benchmark
Teacher 4	F	26	54	Benchmark	16	Well Below Benchmark Benchmark	16	Well Below Benchmark Benchmark	112	Well Below Benchmark Benchmark
Teacher 4	M	50	47	Benchmark	46	Benchmark	31	Benchmark	174	Benchmark
Teacher 4	F	65	53	Benchmark	56	Benchmark	36	Benchmark	210	Benchmark
Teacher 4	M	31	32	Benchmark	36	Benchmark	9	Well Below Benchmark Benchmark	108	Well Below Benchmark Benchmark
Teacher 4	F	34	60	Benchmark	50	Benchmark	9	Well Below Benchmark Benchmark	153	Benchmark
Teacher 4	F	57	58	Benchmark	60	Benchmark	39	Benchmark	214	Benchmark
Teacher 4	F	39	49	Benchmark	46	Benchmark	23	Benchmark	157	Benchmark
Teacher 4	F	20	28	Well Below Benchmark Benchmark	29	Benchmark	0	Below Benchmark	77	Below Benchmark
Teacher 4	M	5	40	Benchmark	21	Benchmark	8	Well Below Benchmark Benchmark	74	Below Benchmark
Teacher 4	M	37	22	Well Below Benchmark Benchmark	51	Benchmark	17	Benchmark	127	Benchmark
Teacher 4	M	22	33	Benchmark	45	Benchmark	10	Well Below Benchmark Benchmark	110	Well Below Benchmark Benchmark
Teacher 4	M	29	20	Well Below Benchmark Benchmark	50	Benchmark	15	Well Below Benchmark Benchmark	114	Well Below Benchmark Benchmark
Teacher 4	F	57	54	Benchmark	55	Benchmark	29	Benchmark	195	Benchmark
Teacher 4	M	51	58	Benchmark	63	Benchmark	33	Benchmark	205	Benchmark
Teacher 4	F	53	45	Benchmark	39	Benchmark	30	Benchmark	167	Benchmark
Teacher 5	M	53	51	Benchmark	55	Benchmark	45	Benchmark	204	Benchmark
Teacher 5	F	48	55	Benchmark	51	Benchmark	28	Benchmark	182	Benchmark
Teacher 5	M	54	59	Benchmark	65	Benchmark	47	Benchmark	225	Benchmark
Teacher 5	M	40	56	Benchmark	53	Benchmark	30	Benchmark	179	Benchmark
Teacher 5	M	60	48	Benchmark	47	Benchmark	61	Benchmark	216	Benchmark
Teacher 5	M	37	59	Benchmark	51	Benchmark	34	Benchmark	181	Benchmark
Teacher 5	F	53	52	Benchmark	53	Benchmark	24	Benchmark	182	Benchmark
Teacher 5	F	76	41	Benchmark	53	Benchmark	39	Benchmark	209	Benchmark
Teacher 5	F	55	46	Benchmark	47	Benchmark	40	Benchmark	188	Benchmark
Teacher 5	M	54	60	Benchmark	52	Benchmark	56	Benchmark	222	Benchmark
Teacher 5	F	65	60	Benchmark	59	Benchmark	37	Benchmark	221	Benchmark
Teacher 5	M	39	56	Benchmark	53	Benchmark	39	Benchmark	187	Benchmark
Teacher 5	M	75	52	Benchmark	52	Benchmark	136	Benchmark	315	Benchmark
Teacher 5	M	75	58	Benchmark	51	Benchmark	126	Benchmark	310	Benchmark
Teacher 5	M	31	49	Benchmark	56	Benchmark	37	Benchmark	173	Benchmark
Teacher 5	F	70	51	Benchmark	59	Benchmark	51	Benchmark	231	Benchmark
Teacher 5	F	42	57	Benchmark	49	Benchmark	40	Benchmark	188	Benchmark
Teacher 5	F	40	47	Benchmark	48	Benchmark	39	Benchmark	174	Benchmark
Teacher 5	F	70	48	Benchmark	48	Benchmark	119	Benchmark	285	Benchmark
Teacher 5	F	53	46	Benchmark	47	Benchmark	42	Benchmark	188	Benchmark

Teacher 5	F	46	45	Benchmark	54	Benchmark	39	Benchmark	184	Benchmark
Teacher 5	M	32	57	Benchmark	37	Benchmark	16	Well Below Benchmark	142	Benchmark
Teacher 6	M	50	40	Benchmark	64	Benchmark	27	Benchmark	181	Benchmark
Teacher 6	F	66	46	Benchmark	79	Benchmark	54	Benchmark	245	Benchmark
Teacher 6	F	52	40	Benchmark	59	Benchmark	49	Benchmark	200	Benchmark
Teacher 6	F	50	45	Benchmark	74	Benchmark	15	Well Below Benchmark	184	Benchmark
Teacher 6	M	51	37	Benchmark	51	Benchmark	25	Benchmark	164	Benchmark
Teacher 6	F	59	34	Benchmark	56	Benchmark	36	Benchmark	185	Benchmark
Teacher 6	M	36	28	Well Below Benchmark	38	Benchmark	28	Benchmark	130	Benchmark
Teacher 6	F	17	38	Benchmark	12	Well Below Benchmark	9	Well Below Benchmark	76	Below Benchmark
Teacher 6	M	55	42	Benchmark	73	Benchmark	34	Benchmark	204	Benchmark
Teacher 6	M	34	18	Below Benchmark	15	Well Below Benchmark	15	Well Below Benchmark	82	Below Benchmark
Teacher 6	M	31	33	Benchmark	70	Benchmark	23	Benchmark	157	Benchmark
Teacher 6	M	43	38	Benchmark	61	Benchmark	32	Benchmark	174	Benchmark
Teacher 6	F	73	46	Benchmark	66	Benchmark	85	Benchmark	270	Benchmark
Teacher 6	F	42	44	Benchmark	66	Benchmark	23	Benchmark	175	Benchmark
Teacher 6	F	54	34	Benchmark	61	Benchmark	33	Benchmark	182	Benchmark
Teacher 6	M	39	46	Benchmark	71	Benchmark	27	Benchmark	183	Benchmark
Teacher 6	M	22	30	Benchmark	47	Benchmark	7	Below Benchmark	106	Well Below Benchmark
Teacher 6	F	56	44	Benchmark	58	Benchmark	39	Benchmark	197	Benchmark
Teacher 6	F	45	51	Benchmark	30	Benchmark	25	Benchmark	151	Benchmark
Teacher 6	M	86	46	Benchmark	73	Benchmark	63	Benchmark	268	Benchmark

Appendix E

End of Year Phoneme Segmentation Fluency Scores/Proficiency Levels, End of Year Nonsense Word Fluency Scores/Proficiency Levels, End of Year Letter Naming Fluency Scores, and End of Year Total Composite Scores/Proficiency Levels DIBELS Next Half-day Kindergarten

Teacher	Gender	EOY-PHONEME SEGMENTATION FLUENCY (PSF)	EOY-PSF PROFICIENCY LEVEL	EOY-NONSENSE WORD FLUENCY (NWF) CORRECT LETTER SOUNDS	EOY-NWF PROFICIENCY LEVEL	EOY-LETTER NAMING FLUENCY (LNF)	EOY-TOTAL COMPOSITE SCORE	EOY-TOTAL COMPOSITE SCORE PROFICIENCY LEVEL
Teacher 1	M	57	Benchmark	30	Benchmark	49	136	Benchmark
Teacher 1	F	47	Benchmark	45	Benchmark	68	160	Benchmark
Teacher 1	F	50	Benchmark	24	Below Benchmark	67	141	Benchmark
Teacher 1	F	0	Well Below Benchmark	0	Well Below Benchmark	3	3	Well Below Benchmark
Teacher 1	F	49	Benchmark	26	Below Benchmark	25	100	Below Benchmark
Teacher 1	F	54	Benchmark	19	Below Benchmark	43	116	Below Benchmark
Teacher 1	M	39	Below Benchmark	33	Benchmark	59	131	Benchmark
Teacher 1	F	37	Below Benchmark	9	Well Below Benchmark	36	82	Well Below Benchmark
Teacher 1	F	56	Benchmark	55	Benchmark	76	187	Benchmark
Teacher 1	M	63	Benchmark	143	Benchmark	74	280	Benchmark
Teacher 1	M	51	Benchmark	49	Benchmark	78	178	Benchmark
Teacher 1	F	52	Benchmark	32	Benchmark	70	154	Benchmark
Teacher 1	F	62	Benchmark	22	Below Benchmark	56	140	Benchmark
Teacher 1	M	41	Benchmark	22	Below Benchmark	30	93	Below Benchmark
Teacher 1	M	46	Benchmark	129	Benchmark	85	260	Benchmark
Teacher 1	F	59	Benchmark	44	Benchmark	67	170	Benchmark
Teacher 1	M	59	Benchmark	63	Benchmark	60	182	Benchmark
Teacher 1	M	61	Benchmark	25	Below Benchmark	49	135	Benchmark

Teacher 1	F	56	Benchmark	28	Benchmark	38	122	Benchmark
Teacher 1	F	44	Benchmark	27	Below Benchmark	36	107	Below Benchmark
Teacher 1	M	49	Benchmark	91	Benchmark	61	201	Benchmark
Teacher 1	M	43	Benchmark	38	Benchmark	44	125	Benchmark
Teacher 2	M	40	Benchmark	38	Benchmark	59	137	Benchmark
Teacher 2	M	52	Benchmark	25	Below Benchmark	31	108	Below Benchmark
Teacher 2	F	50	Benchmark	46	Benchmark	71	167	Benchmark
Teacher 2	F	58	Benchmark	63	Benchmark	54	175	Benchmark
Teacher 2	M	42	Benchmark	39	Benchmark	67	148	Benchmark
Teacher 2	M	58	Benchmark	58	Benchmark	71	187	Benchmark
Teacher 2	M	43	Benchmark	29	Benchmark	57	129	Benchmark
Teacher 2	M	56	Benchmark	77	Benchmark	77	210	Benchmark
Teacher 2	M	44	Benchmark	42	Benchmark	46	132	Benchmark
Teacher 2	M	61	Benchmark	30	Benchmark	67	158	Benchmark
Teacher 2	M	59	Benchmark	64	Benchmark	60	183	Benchmark
Teacher 2	F	52	Benchmark	44	Benchmark	45	141	Benchmark
Teacher 2	F	56	Benchmark	81	Benchmark	79	216	Benchmark
Teacher 2	F	29	Below Benchmark	27	Below Benchmark	33	89	Below Benchmark
Teacher 2	M	45	Benchmark	32	Benchmark	61	138	Benchmark
Teacher 2	F	46	Benchmark	23	Below Benchmark	36	105	Below Benchmark
Teacher 2	F	46	Benchmark	35	Benchmark	47	128	Benchmark
Teacher 2	F	52	Benchmark	79	Benchmark	73	204	Benchmark
Teacher 2	M	54	Benchmark	30	Benchmark	39	123	Benchmark
Teacher 2	F	64	Benchmark	66	Benchmark	82	212	Benchmark
Teacher 2	M	31	Below Benchmark	66	Benchmark	38	135	Benchmark
Teacher 2	M	50	Benchmark	89	Benchmark	76	215	Benchmark
Teacher 2	M	35	Below Benchmark	34	Benchmark	66	135	Benchmark

Teacher 3	M	61	Benchmark	40	Benchmark	50	151	Benchmark
Teacher 3	M	48	Benchmark	18	Below Benchmark	49	115	Below Benchmark
Teacher 3	M	55	Benchmark	39	Benchmark	59	153	Benchmark
Teacher 3	M	14	Well Below Benchmark	50	Benchmark	64	128	Benchmark
Teacher 3	F	27	Below Benchmark	45	Benchmark	19	91	Below Benchmark
Teacher 3	F	45	Benchmark	26	Below Benchmark	56	127	Benchmark
Teacher 3	M	39	Below Benchmark	31	Benchmark	48	118	Below Benchmark
Teacher 3	M	41	Benchmark	69	Benchmark	56	166	Benchmark
Teacher 3	M	40	Benchmark	33	Benchmark	41	114	Below Benchmark
Teacher 3	M	49	Benchmark	47	Benchmark	74	170	Benchmark
Teacher 3	F	55	Benchmark	28	Benchmark	60	143	Benchmark
Teacher 3	M	59	Benchmark	39	Benchmark	37	135	Benchmark
Teacher 3	F	48	Benchmark	57	Benchmark	60	165	Benchmark
Teacher 3	F	49	Benchmark	139	Benchmark	82	270	Benchmark
Teacher 3	F	61	Benchmark	39	Benchmark	43	143	Benchmark
Teacher 3	M	43	Benchmark	43	Benchmark	42	128	Benchmark
Teacher 3	F	51	Benchmark	46	Benchmark	51	148	Benchmark
Teacher 3	F	56	Benchmark	107	Benchmark	67	230	Benchmark
Teacher 4	M	52	Benchmark	102	Benchmark	75	229	Benchmark
Teacher 4	M	61	Benchmark	43	Benchmark	51	155	Benchmark
Teacher 4	M	41	Benchmark	52	Benchmark	62	155	Benchmark
Teacher 4	F	41	Benchmark	42	Benchmark	40	123	Benchmark
Teacher 4	F							
Teacher 4	F	53	Benchmark	38	Benchmark	51	142	Benchmark
Teacher 4	M	56	Benchmark	56	Benchmark	85	197	Benchmark
Teacher 4	M	48	Benchmark	28	Benchmark	50	126	Benchmark
Teacher 4	F	56	Benchmark	43	Benchmark	64	163	Benchmark

Teacher 4	F	51	Benchmark	44	Benchmark	56	151	Benchmark
Teacher 4	M	40	Benchmark	39	Benchmark	42	121	Benchmark
Teacher 4	F	31	Below Benchmark	27	Below Benchmark	35	93	Below Benchmark
Teacher 4	M	47	Benchmark	133	Benchmark	73	253	Benchmark
Teacher 4	M	41	Benchmark	138	Benchmark	77	256	Benchmark
Teacher 4	F	56	Benchmark	69	Benchmark	60	185	Benchmark
Teacher 4	M	39	Below Benchmark	44	Benchmark	46	129	Benchmark
Teacher 4	F	53	Benchmark	52	Benchmark	65	170	Benchmark
Teacher 4	F							
Teacher 5	F	49	Benchmark	28	Benchmark	44	121	Benchmark
Teacher 5	M	46	Benchmark	40	Benchmark	39	125	Benchmark
Teacher 5	M	43	Benchmark	65	Benchmark	60	168	Benchmark
Teacher 5	F	52	Benchmark	139	Benchmark	73	264	Benchmark
Teacher 5	M	46	Benchmark	51	Benchmark	40	137	Benchmark
Teacher 5	F	43	Benchmark	30	Benchmark	47	120	Benchmark
Teacher 5	F	51	Benchmark	35	Benchmark	55	141	Benchmark
Teacher 5	M	43	Benchmark	57	Benchmark	69	169	Benchmark
Teacher 5	F	47	Benchmark	23	Below Benchmark	54	124	Benchmark
Teacher 5	M	45	Benchmark	32	Benchmark	68	145	Benchmark
Teacher 5	F	40	Benchmark	26	Below Benchmark	33	99	Below Benchmark
Teacher 5	M	44	Benchmark	46	Benchmark	62	152	Benchmark
Teacher 5	M	47	Benchmark	124	Benchmark	71	242	Benchmark
Teacher 5	M	48	Benchmark	61	Benchmark	70	179	Benchmark
Teacher 5	F	51	Benchmark	40	Benchmark	60	151	Benchmark
Teacher 5	M	46	Benchmark	33	Benchmark	48	127	Benchmark
Teacher 5	F	50	Benchmark	68	Benchmark	74	192	Benchmark
Teacher 6	M	50	Benchmark	53	Benchmark	46	149	Benchmark

Teacher 6	M	43	Benchmark	56	Benchmark	72	171	Benchmark
Teacher 6	F	36	Below Benchmark	21	Below Benchmark	49	106	Below Benchmark
Teacher 6	M	35	Below Benchmark	48	Benchmark	64	147	Benchmark
Teacher 6	F	37	Below Benchmark	37	Benchmark	55	129	Benchmark
Teacher 6	F	42	Benchmark	34	Benchmark	49	125	Benchmark
Teacher 6	M	45	Benchmark	83	Benchmark	68	196	Benchmark
Teacher 6	F	37	Below Benchmark	36	Benchmark	57	130	Benchmark
Teacher 6	F	35	Below Benchmark	54	Benchmark	64	153	Benchmark
Teacher 6	M	61	Benchmark	37	Benchmark	58	156	Benchmark
Teacher 6	F	40	Benchmark	31	Benchmark	21	92	Below Benchmark
Teacher 6	M	36	Below Benchmark	29	Benchmark	58	123	Benchmark
Teacher 6	F	54	Benchmark	38	Benchmark	50	142	Benchmark
Teacher 6	F	37	Below Benchmark	46	Benchmark	58	141	Benchmark
Teacher 6	M	4	Well Below Benchmark	10	Well Below Benchmark	25	39	Well Below Benchmark
Teacher 6	M	49	Benchmark	57	Benchmark	69	175	Benchmark
Teacher 6	M	43	Benchmark	27	Below Benchmark	35	105	Below Benchmark
Teacher 6	M	16	Well Below Benchmark	10	Well Below Benchmark	29	55	Well Below Benchmark

Appendix F

End of Year Phoneme Segmentation Fluency Scores/Proficiency Levels, End of Year Nonsense Word Fluency Scores/Proficiency Levels, End of Year Letter Naming Fluency Scores, and End of Year Total Composite Scores/Proficiency Levels DIBELS Next Full-day Kindergarten

Teacher	Gender	EOY-PHONEME SEGMENTATION FLUENCY (PSF)	EOY-PSF PROFICIENCY LEVEL	EOY-NONSENSE WORD FLUENCY (NWF) CORRECT LETTER SOUNDS	EOY-NWF PROFICIENCY LEVEL	EOY-LETTER NAMING FLUENCY (LNF)	EOY-TOTAL COMPOSITE SCORE	EOY-TOTAL COMPOSITE SCORE PROFICIENCY LEVEL
Teacher 1	M	56	Benchmark	45	Benchmark	65	166	Benchmark
Teacher 1	M	60	Benchmark	38	Benchmark	56	154	Benchmark
Teacher 1	M	61	Benchmark	43	Benchmark	80	184	Benchmark
Teacher 1	M	56	Benchmark	19	Well Below Benchmark Benchmark	32	107	Well Below Benchmark Benchmark
Teacher 1	F	53	Benchmark	70	Benchmark	75	198	Benchmark
Teacher 1	F	62	Benchmark	36	Benchmark	53	151	Benchmark
Teacher 1	M	56	Benchmark	33	Benchmark	43	132	Benchmark
Teacher 1	F	53	Benchmark	55	Benchmark	62	170	Benchmark
Teacher 1	M	55	Benchmark	23	Well Below Benchmark Benchmark	46	124	Benchmark
Teacher 1	M	60	Benchmark	45	Benchmark	70	175	Benchmark
Teacher 1	F	56	Benchmark	44	Benchmark	54	154	Benchmark
Teacher 1	F	57	Benchmark	42	Benchmark	60	159	Benchmark
Teacher 1	M	54	Benchmark	32	Benchmark	53	139	Benchmark
Teacher 1	F	62	Benchmark	24	Well Below Benchmark Benchmark	53	139	Benchmark
Teacher 1	F	60	Benchmark	32	Benchmark	64	156	Benchmark
Teacher 1	M	65	Benchmark	42	Benchmark	66	173	Benchmark
Teacher 1	M	61	Benchmark	45	Benchmark	64	170	Benchmark
Teacher 1	M	57	Benchmark	51	Benchmark	75	183	Benchmark

Teacher 1	M	31	Well Below Benchmark Benchmark	32	Benchmark	48	111	Well Below Benchmark Benchmark
Teacher 2	M	51	Benchmark	33	Benchmark	50	134	Benchmark
Teacher 2	M	53	Benchmark	136	Benchmark	61	250	Benchmark
Teacher 2	M	62	Benchmark	43	Benchmark	62	167	Benchmark
Teacher 2	F	35	Well Below Benchmark Benchmark	29	Benchmark	49	113	Well Below Benchmark Benchmark
Teacher 2	M	50	Benchmark	57	Benchmark	48	155	Benchmark
Teacher 2	M	45	Benchmark	52	Benchmark	72	169	Benchmark
Teacher 2	M	45	Benchmark	30	Benchmark	48	123	Benchmark
Teacher 2	F	43	Benchmark	20	Well Below Benchmark Benchmark	38	101	Well Below Benchmark Benchmark
Teacher 2	M	70	Benchmark	48	Benchmark	63	181	Benchmark
Teacher 2	F	64	Benchmark	34	Benchmark	45	143	Benchmark
Teacher 2	F	73	Benchmark	32	Benchmark	60	165	Benchmark
Teacher 2	F	56	Benchmark	28	Benchmark	38	122	Benchmark
Teacher 2	M	64	Benchmark	36	Benchmark	47	147	Benchmark
Teacher 2	F	63	Benchmark	38	Benchmark	68	169	Benchmark
Teacher 2	F	62	Benchmark	58	Benchmark	77	197	Benchmark
Teacher 2	F	49	Benchmark	55	Benchmark	46	150	Benchmark
Teacher 2	M	44	Benchmark	125	Benchmark	74	243	Benchmark
Teacher 2	M	51	Benchmark	45	Benchmark	47	143	Benchmark
Teacher 2	M	51	Benchmark	46	Benchmark	68	165	Benchmark
Teacher 2	F	62	Benchmark	36	Benchmark	60	158	Benchmark
Teacher 3	F	64	Benchmark	76	Benchmark	63	203	Benchmark
Teacher 3	F	65	Benchmark	58	Benchmark	65	188	Benchmark
Teacher 3	M	60	Benchmark	112	Benchmark	71	243	Benchmark
Teacher 3	M	0	Below Benchmark	28	Benchmark	30	58	Below Benchmark
Teacher 3	M	73	Benchmark	50	Benchmark	68	191	Benchmark

Teacher 3	M	68	Benchmark	56	Benchmark	64	188	Benchmark
Teacher 3	F	70	Benchmark	58	Benchmark	67	195	Benchmark
Teacher 3	F	77	Benchmark	60	Benchmark	80	217	Benchmark
Teacher 3	M	70	Benchmark	63	Benchmark	62	195	Benchmark
Teacher 3	M	54	Benchmark	42	Benchmark	54	150	Benchmark
Teacher 3	M	60	Benchmark	55	Benchmark	76	191	Benchmark
Teacher 3	M	67	Benchmark	56	Benchmark	61	184	Benchmark
Teacher 3	M	60	Benchmark	42	Benchmark	57	159	Benchmark
Teacher 3	F	49	Benchmark	23	Well Below Benchmark Benchmark	33	105	Well Below Benchmark Benchmark
Teacher 3	F	66	Benchmark	35	Benchmark	43	144	Benchmark
Teacher 3	F	67	Benchmark	52	Benchmark	72	191	Benchmark
Teacher 3	M	72	Benchmark	32	Benchmark	51	155	Benchmark
Teacher 3	M	64	Benchmark	47	Benchmark	64	175	Benchmark
Teacher 4	F	62	Benchmark	111	Benchmark	96	269	Benchmark
Teacher 4	F	47	Benchmark	20	Well Below Benchmark Benchmark	38	105	Well Below Benchmark Benchmark
Teacher 4	M	59	Benchmark	28	Benchmark	65	152	Benchmark
Teacher 4	M	9	Below Benchmark	17	Well Below Benchmark Benchmark	19	45	Below Benchmark
Teacher 4	M	53	Benchmark	71	Benchmark	77	201	Benchmark
Teacher 4	F	49	Benchmark	25	Well Below Benchmark Benchmark	36	110	Well Below Benchmark Benchmark
Teacher 4	M	58	Benchmark	47	Benchmark	62	167	Benchmark
Teacher 4	F	61	Benchmark	26	Well Below Benchmark Benchmark	69	156	Benchmark
Teacher 4	M	67	Benchmark	15	Well Below Benchmark Benchmark	36	118	Well Below Benchmark Benchmark
Teacher 4	F	69	Benchmark	15	Well Below Benchmark Benchmark	31	115	Well Below Benchmark Benchmark
Teacher 4	F	51	Benchmark	27	Well Below Benchmark	59	137	Benchmark

					Benchmark			
Teacher 4	F	57	Benchmark	10	Below Benchmark	41	108	Well Below Benchmark Benchmark
Teacher 4	F	44	Benchmark	20	Well Below Benchmark Benchmark	46	110	Well Below Benchmark Benchmark
Teacher 4	M	18	Below Benchmark	10	Below Benchmark	11	39	Below Benchmark
Teacher 4	M	50	Benchmark	24	Well Below Benchmark Benchmark	37	111	Well Below Benchmark Benchmark
Teacher 4	M	60	Benchmark	40	Benchmark	56	156	Benchmark
Teacher 4	M	64	Benchmark	24	Well Below Benchmark Benchmark	40	128	Benchmark
Teacher 4	F	62	Benchmark	62	Benchmark	70	194	Benchmark
Teacher 4	M	70	Benchmark	31	Benchmark	59	160	Benchmark
Teacher 4	F	44	Benchmark	52	Benchmark	66	162	Benchmark
Teacher 5	M	53	Benchmark	57	Benchmark	48	158	Benchmark
Teacher 5	F	56	Benchmark	21	Well Below Benchmark Benchmark	55	132	Benchmark
Teacher 5	M	59	Benchmark	51	Benchmark	60	170	Benchmark
Teacher 5	M	54	Benchmark	37	Benchmark	55	146	Benchmark
Teacher 5	M	54	Benchmark	54	Benchmark	73	181	Benchmark
Teacher 5	M	61	Benchmark	42	Benchmark	60	163	Benchmark
Teacher 5	F	68	Benchmark	25	Well Below Benchmark Benchmark	46	139	Benchmark
Teacher 5	F	57	Benchmark	46	Benchmark	77	180	Benchmark
Teacher 5	F	50	Benchmark	44	Benchmark	70	164	Benchmark
Teacher 5	M	66	Benchmark	36	Benchmark	60	162	Benchmark
Teacher 5	F	65	Benchmark	43	Benchmark	76	184	Benchmark
Teacher 5	M	55	Benchmark	39	Benchmark	42	136	Benchmark
Teacher 5	M	50	Benchmark	143	Benchmark	75	268	Benchmark
Teacher 5	M	59	Benchmark	143	Benchmark	92	294	Benchmark
Teacher 5	M	56	Benchmark	36	Benchmark	49	141	Benchmark

Teacher 5	F	67	Benchmark	70	Benchmark	86	223	Benchmark
Teacher 5	F	49	Benchmark	40	Benchmark	70	159	Benchmark
Teacher 5	F	61	Benchmark	42	Benchmark	47	150	Benchmark
Teacher 5	F	61	Benchmark	143	Benchmark	83	287	Benchmark
Teacher 5	F	52	Benchmark	48	Benchmark	56	156	Benchmark
Teacher 5	F	63	Benchmark	55	Benchmark	61	179	Benchmark
Teacher 5	M	57	Benchmark	17	Well Below Benchmark Benchmark	44	118	Well Below Benchmark Benchmark
Teacher 6	M	57	Benchmark	44	Benchmark	49	150	Benchmark
Teacher 6	F	74	Benchmark	76	Benchmark	76	226	Benchmark
Teacher 6	F	58	Benchmark	83	Benchmark	53	194	Benchmark
Teacher 6	F	61	Benchmark	32	Benchmark	53	146	Benchmark
Teacher 6	M	67	Benchmark	23	Well Below Benchmark Benchmark	68	158	Benchmark
Teacher 6	F	64	Benchmark	43	Benchmark	57	164	Benchmark
Teacher 6	M	54	Benchmark	44	Benchmark	41	139	Benchmark
Teacher 6	F	41	Benchmark	29	Benchmark	25	95	Well Below Benchmark Benchmark
Teacher 6	M	63	Benchmark	46	Benchmark	46	155	Benchmark
Teacher 6	M	59	Benchmark	37	Benchmark	34	130	Benchmark
Teacher 6	M	66	Benchmark	39	Benchmark	44	149	Benchmark
Teacher 6	M	59	Benchmark	40	Benchmark	56	155	Benchmark
Teacher 6	F	77	Benchmark	106	Benchmark	70	253	Benchmark
Teacher 6	F	48	Benchmark	41	Benchmark	39	128	Benchmark
Teacher 6	F	73	Benchmark	40	Benchmark	72	185	Benchmark
Teacher 6	M	79	Benchmark	41	Benchmark	50	170	Benchmark
Teacher 6	M	50	Benchmark	31	Benchmark	31	112	Well Below Benchmark Benchmark
Teacher 6	F	64	Benchmark	48	Benchmark	70	182	Benchmark
Teacher	F	48	Benchmark	28	Benchmark	45	121	Benchmark

6								
Teacher 6	M	66	Benchmark	100	Benchmark	84	250	Benchmark

Appendix G

PARKLAND SCHOOL DISTRICT
"Educating For Success, Inspiring Excellence."

Cetronia Elementary School
3635 Broadway, Allentown, PA 18104-5215
PHONE 610-351-5860 FAX 610-351-5869

JAMES P. GIAQUINTO
Principal

August 13, 2013

Dear Dr. Dennis Riker and Mr. Michael Roth,

I am a doctoral student at Seton Hall University and a principal at Cetronia Elementary School in the Parkland School District. The purpose of my dissertation will be to investigate the differences, if any, in reading achievement students when receiving full-day kindergarten programming versus half-day programs, for boys and girls. The data will exclusively come from the Dynamic Indicators of Basic Early Literacy Skills (DIBELS).

The intent of this letter is to ask permission to use the 2012-2013 DIBELS NEXT data from the Nazareth School District. Specifically, the research design will analyze six full-day kindergarten classrooms in your school district compared to six half-day programs in the Parkland School District during the three benchmark windows (beginning of the year, middle of the year, and end of the year). The three questions that will guide my study are:

1) What are the differences, if any, in early literacy levels as measured by four DIBELS reading measures along with total composite scores, for at risk students receiving full-day kindergarten when compared to at risk students receiving half-day kindergarten?
   a) Letter Naming Fluency (LNF)
   b) First Sound Fluency (FSF)
   c) Phoneme Segmentation Fluency (PSF)
   d) Nonsense Word Fluency (NWF)
2) What are the gains, if any, in the DIBELS NEXT composite scores for girls enrolled in full-day as compared to girls in half-day kindergarten?
3) What are the gains, if any, in the DIBELS NEXT composite scores for boys enrolled in full-day kindergarten compared to boys in half-day?

The student names are not needed and will not be used in any part of this dissertation. Instead, the results will be used to assist future discussions regarding the magnitude of change different kindergarten programs may offer.

I appreciate your careful consideration to this request and if you have any questions about the research design or confidentiality of the study, please contact me at 610-351-5860.

Sincerely,

Mr. James Giaquinto
Principal

We Are An Equal Rights and Equal Opportunity School District

Appendix H

Example of Transformation from Nominal Variables Frequencies as Nominal, Ordinal, and Dichotomous

BOY_FSF_LEVEL

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		13	5.5	5.5	5.5
	Below Benchmark	25	10.6	10.6	16.2
	Benchmark	163	69.4	69.4	85.5
	Well Below Benchmark	25	10.6	10.6	96.2
	Well Below Benchmark Benchmark	9	3.8	3.8	100.0
	Total	235	100.0	100.0	

BOY_FSF_LEVEL2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Well Below Benchmark Benchmark	9	3.8	4.1	4.1
	2 Well Below Benchmark	25	10.6	11.3	15.3
	3 Below Benchmark	25	10.6	11.3	26.6
	4 Benchmark	163	69.4	73.4	100.0
	Total	222	94.5	100.0	
Missing	System	13	5.5		
Total		235	100.0		

BOY_FSF_LEVEL3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0 BELOW BENCHMARCK	59	25.1	26.6	26.6
	1 AT BENCHMARK	163	69.4	73.4	100.0
	Total	222	94.5	100.0	
Missing	System	13	5.5		
Total		235	100.0		