THE DIFFERENCES IN READING READINESS AMONG KINDERGARTENERS WHO ATTENDED STATE AND FEDERALLY FUNDED PRE-K IN ALABAMA

by

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ABSTRACT

Kelli Tucker. THE DIFFERENCES IN READING READINESS AMONG KINDERGARTENERS WHO ATTENDED STATE AND FEDERALLY FUNDED PRE-K IN ALABAMA (under the direction of Dr. Fowler) School of Education, Liberty University, December, 2011.

This causal comparative study sought to examine differences in reading readiness of kindergarteners who attended public school pre-k, both state and federally funded.

Scores were examined for a convenience sample of 131 students who attended pre-k in the 2007-08 and 2008-09 school years in a school system in east central Alabama. The DIBELS were used to gather kindergarten data in order to examine significant differences in reading readiness. MANCOVA was used to analyze the data for significant differences. The results indicated there were no significant differences, after a full year in kindergarten, in reading readiness of children who attended state and federally funded public school pre-k. Significant differences were found at the middle of the kindergarten year.

Descriptors: DIBELS; early childhood education; letter knowledge; phonemic awareness; phonics; pre-k; quantitative research; reading readiness.
DEDICATION

The dedication of any document, whether it is a book, a dissertation, or any other form of literature has always meant to me that without those listed, the work may not have ever taken place. With that in mind, I dedicate this dissertation to my parents who figured out many years ago that family support is imperative to the success of the children. My mom, Libby Leak and my father and stepmother, Thomas and Jennifer Moore have stood behind me and offered love and encouragement throughout this entire project. Also, I dedicate this work to my late stepfather, Doss Leak who always had the confidence that I could accomplish whatever I set my mind out to do.

I would also like to dedicate this dissertation to the best friend any one could have, Alison Osborn. Alison, without you as a sounding board I never would have finished. I have definitely been blessed that God put you in my life.

Additionally, to my sisters of Beta State and Tau Chapter of The Delta Kappa Gamma Society International, the financial support through scholarships and encouraging words were imperative to the completion of this dissertation.

Finally, this dissertation is dedicated to all of the pre-k teachers, four-year-old children, and supporters of early childhood education around the world.
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List of Abbreviations

Alabama Reading Initiative (ARI)
Child Care Development Funds (CCDF)
Child Development Associate (CDA)
Dependent Variable (DV)
Dynamic Indicators of Basic Early Literacy Skills 6th Edition (DIBELS)
Early Childhood Environmental Rating Scale – Revised (ECERS-R)
Initial Sound Fluency (ISF)
Independent Variable (IV)
Letter Naming Fluency (LNF)
Local Education Agency (LEA)
Multivariate Analysis of Covariance (MANCOVA)
National Association of the Education of Young Children (NAEYC)
National Institute of Early Education Research (NIEER)
Nonsense Word Fluency (NWF)
Phoneme Segmentation Fluency (PSF)
Pre-kindergarten (Pre-k)
Southern Association of Colleges and Schools (SACS)
Statistical Package for the Social Sciences (SPSS)
Temporary Assistance for Needy Families (TANF)
CHAPTER ONE: INTRODUCTION

In recent years, *The No Child Left Behind Act* has directed people’s attention toward accountability and proficiency. In this era of high stakes tests and focus on student achievement, addressing students’ varying abilities as they enter kindergarten is of utmost importance (Lazarus & Ortega, 2007). Many feel that the means to overcome this variability in abilities is to offer high quality, universal pre-kindergarten (pre-k) education that provides developmentally appropriate instruction for four-year-olds. Pre-k has been shown in research to effectively increase the acquisition of skills in language, academics, and social competencies (Burchinal et al., 2008; Mashburn & Pianta, 2006; Mashburn et al., 2008; Wong, Cook, Barnett, & Jung, 2008), even though a debate exists about the characteristics that make pre-k effective and the setting for which it should take place (Barnett, Epstein, Friedman, Boyd, & Hustedt, 2008; Burchinal et al., 2008; Gormley & Gayer, 2005; Mashburn & Pianta, 2006; Mashburn et al., 2008). According to Vandell (2004), research suggests that offering high quality pre-k would result in a greater proportion of the population being “ready to learn” at the beginning of their school career. Federal and state governments are spending time and money on this notion of pre-k (Barnett et al., 2010). The purpose of pre-k is to provide a variety of experiences in the areas of pre-academic material and school/social situations in order to increase school-related achievement and social and behavioral competence (Burchinal et al., 2008). The United States Secretary of Education, Arne Duncan, named the expansion of pre-k as a priority (Klein, 2009).
While pre-k is not a new concept, the push for early education was renewed during the Bush administration (Witte & Trowbridge, 2005) and has continued into the Obama administration (Klein, 2009). That all children should start school ready to learn was the first goal listed in *The Goals 2000: Educate America Act*, which was formulated during the Bush administration (Zigler & Styfco, 2000). Under the Good Start, Grow Smart initiative presented in 2002, the federal preschool entity Head Start was encouraged to emphasize early reading skills as well as school success skills (Witte & Trowbridge, 2005). The same philosophy was encouraged for other early childhood development programs as well (Executive Office of the President, 2002). In addition to reading and school success skills, Barnett and Robin (2006) emphasized possible societal gains from pre-k. These included the development of more responsible citizens, higher earning potential, a more productive workforce, and stronger families and communities as a result of state supported—rather than federally supported—pre-k initiatives. Furthermore, Barnett and Escobar (1987) called attention to this notion when they stated that programs addressing the needs of early childhood education were a good investment of resources, especially when focused on the needs of the disadvantaged.

The National Committee for Economic Development encourages high quality, universal pre-k for more than educational gains (Morrisey & Warner, 2007). This committee, in 2002 and again in 2004, emphasized high quality, universal pre-k for the purpose of economic prosperity. However, it has been over a decade since *Goals 2000* was introduced and children from higher income households are still more likely to be enrolled in pre-k programs than those from economically disadvantaged homes (Magnuson, Meyers, Ruhm, & Waldfogel, 2007).
The *State of Preschool 2010 Yearbook* (Barnett et al., 2010) presented detailed information concerning state support of pre-k programs throughout the United States. Barnett et al. (2010) reported that 27% of four-year-olds attend a state supported pre-k program, an increase from 25% the prior year (Barnett, Epstein, Friedman, Sansanelli, & Hustedt, 2009). When special education programs for four-year-olds and Head Start programs for four-year-olds are added, the total is increased to 42% of four-year-old children around the country (Barnett et al., 2010). The National Institute of Early Education Research (NIEER) ranked Alabama number one in terms of quality of program when compared to state supported programs around the nation. Alabama has received this top ranking since 2005-06. However, Alabama is ranked 33rd in terms of the number of children served in the NIEER study (Barnett et al., 2010). While the federal government has responded to the need for more pre-k programs through increased funding, programs are not necessarily required to be educationally effective or meet any minimum standards (Magnuson et al., 2007).

While high standards do not guarantee program success, they do provide the necessary resources to work toward educational effectiveness. This research supports the movement in Alabama and around the nation to sustain and increase the focus on the importance of continued funding of high quality pre-k programs for four-year-olds, especially in the public school setting, whether funded with state or federal funds. High quality pre-k implies that programs provide quality care through teacher sensitivity and warmth, teacher response to childrens’ needs, and a positive learning environment (Burchinal et al., 2008). When teachers are sensitive and respond to the needs of children in all domains (i.e. social, emotional, and academic), they provide instruction that is
developmentally appropriate for the children and enhances the learning process. Learning in this type of setting is based on Piagetian and Vygotskian theories, practices, and principles. Quality implies a developmentally appropriate curriculum that is sensitive to the needs of children and requires that these children be active participants in their learning. This quality can also be observed in teachers’ use of multiple approaches to learning, ongoing progress monitoring of the children and the program, and positive teacher-child relationships.

State funded pre-k classes vary by state in terms of access, days/hours of operation, curriculum, and guidelines (Andrews & Slate, 2002). Federally funded pre-k classes are financed by the federal government in a variety of ways, including Temporary Assistance for Needy Families (TANF), Title I, Head Start, and other child care subsidies. The classes also vary in terms of operation, program design, and guidelines, all of which depend on the specific type of federal funds received (Magnuson et al., 2007). These programs, whether state or federally funded, can be found in a variety of settings. One setting in which pre-k is located and supported through state and/or federal funds is in public school systems (Barnett & Robin, 2006). Because early childhood programs are encouraged to emphasize early reading skills for all children—including those considered at-risk, those with low socioeconomic status, and minorities—more research is needed to evaluate the different types of pre-k programs that focus on reading readiness. Additionally, because reading readiness involves a number of critical skills (Fischel et al., 2007), research is needed to address each critical skill separately, including letter knowledge, phonemic awareness, and phonics.
Problem Statement

Pre-k has been shown to have various benefits in the areas of language, academic skills, and social competencies (Burchinal et al., 2008; Mashburn & Pianta, 2006; Mashburn et al., 2008; Wong et al., 2008). Cognitive stimulation prior to entering a formal kindergarten program is one way to provide children with the foundation needed to be successful in later school years (Janus & Duku, 2007). The government sets guidelines that determine which income levels qualify families for Head Start or subsidized child care. These federally supported child care institutions often require limited teacher credentials and training and may not offer the same rich experiences as state supported or private pre-k programs (Magnuson et al., 2007).

Another problem is that many families have too high of an income to qualify for basic child care, but do not earn enough to afford high quality pre-k. This leaves many children lacking in rich educational experiences prior to beginning their school career. Many state governments are increasing funding for public pre-k; however, this is limited by the economy and other growing public needs (Barnett et al., 2009). Those states choosing to finance pre-k often do not allocate adequate funds to programs to provide high quality education for any child who wishes to attend. This limited accessibility coupled with the demands placed on school administrators for achievement and accountability may place many children behind before they even begin school.

In the United States, pre-k education is similar to K-12 education in that the funding sources are a combination of federal, state, and local resources (Barnett & Robin, 2006). Children meeting the age requirement for pre-k are not guaranteed an education, high quality or otherwise. Many children are lacking pre-k experiences in any form and
others do not attend programs of quality due to lack of access. Research exists on high quality, state funded, pre-k in states including Georgia, Oklahoma, and North Carolina (Early et al., 2007; Gormley & Gayer, 2005; Wong et al., 2008), but based on the literature review none could be found on pre-k in Alabama.

**Purpose Statement**

The foundation of the current study relied heavily on research that demonstrated pre-k to be effective in improving skills in language, academics, and social competencies (Burchinal et al., 2008; Mashburn & Pianta, 2006; Mashburn et al., 2008). Despite existing research, there is a debate about the characteristics that make pre-k effective and the setting in which pre-k should take place (Barnett et al., 2008; Burchinal et al., 2008; Gormley & Gayer, 2005; Mashburn & Pianta, 2006; Mashburn et al., 2008; Wong et al., 2008). In Alabama, pre-k that is supported by state funding can be found in public schools, Head Start Centers, private day cares, and faith based centers (Alabama Department of Children’s Affairs, 2009). Furthermore, federally supported pre-k can be found in the same locations utilizing government subsidies, Title I, Child Care Development Funds (CCDF) and TANF (Andrews & Slate, 2002; Barnett et al., 2009; Magnuson et al., 2007; Witte & Trowbridge, 2005; Zigler & Styfco, 2000). There is limited research in which pre-k is examined based on specific location (public school), type of funding received (state/federal funds), and the effects on reading readiness (i.e. letter naming, phonemic awareness, and phonics).

The purpose of the study was to compare state and federally funded public school pre-k programs in Alabama to determine which was more effective in teaching and improving the reading readiness skills of pre-k students. The study will contribute to the
body of research that supports high quality pre-k as important to the development of four-year-olds’ reading readiness upon entering kindergarten. Specifically, the research will assist those in the field of early education to plan for future funding sources and how best to provide quality pre-k in public schools. In addition, the research will assist funding entities to develop the capacity to understand and more fully consider the characteristics or qualities of the pre-k program, standards, and location of services.

**Significance of the Study**

The amount of money any state or local government spends on the education of the very young determines how accessible the program is to children as well as its quality of the service (Barnett & Robin, 2006). This limited access is the problem with the pre-k programs in Alabama. In the *State of Preschool 2008 Yearbook* (Barnett et al., 2008), Alabama was ranked 36th of 38 states. Alabama is now ranked 33rd out of 40 states in terms of access when compared to other states which offer state funded pre-k programs (Barnett et al., 2010). While statistics show improvement, Alabama only serves 3,870 children, or 6%, in state supported programs, and spends $4,544 per child (Barnett et al., 2010). This is a decrease as shown in Barnett, et al. (2009) when Alabama served 5,500 children and spent $5,134 per child.

Oklahoma, Florida, and West Virginia were ranked as the top three states in terms of access to pre-k (Barnett, et al., 2010). These states served 37,356, or 71%; 155,877 or 68%; and 11,522, or 55%, of their respective children. Florida spends $2,514 per child. Oklahoma spends $4,477, and West Virginia spends $5,521 per child. Oklahoma decreased the amount spent per child by $3,376 as shown in Barnett, et al. (2009). While these states were ranked at the top in terms of access, their quality rankings differ
(Barnett, et al., 2010). Oklahoma meets nine of the 10 benchmarks for high quality pre-k. West Virginia meets eight benchmarks, and Florida meets only three.

State funded pre-k in Alabama must meet a number of requirements. All pre-k classes must maintain a minimum teacher-to-student ratio of 18:2, the teacher must have at least a Bachelor’s degree in early childhood education or child development, and the teaching assistant must have a minimum of a Child Development Associate degree (CDA). Furthermore, classes must follow the *Alabama Standards for Four Year Olds*; teacher and assistant must be provided with at least 40 hours of professional development; all children are required to have health screenings for vision, hearing, dental health, and overall health prior to enrollment; meals must be provided; and the state monitors the implementation of the program and provides professional development through technical assistants (Alabama Department of Children’s Affairs, 2009).

Each of these characteristics is the same as those listed in the NIEER study in order for a program to fulfill all quality standards (Barnett et al., 2010). Barnett and Robin (2006) stated that quality is extended when the programs are full day and year round. Gormley and Gayer (2005) and Janus and Duku (2007) supported each of these characteristics and found that pre-k programs that maintain these characteristics will have significant positive effects on student achievement.

While state funded pre-k in Alabama does not provide for year round programs, it does provide for a minimum of 6.5 hours of program operation 180 days per year (Alabama Department of Children’s Affairs, 2009). In addition, all Alabama funded programs must use a research-based curriculum, maintain a minimum score on the Early Childhood Environmental Rating Scale – Revised (ECERS-R), and provide a minimum
of 12 hours of parent enrichment sessions (Alabama Department of Children’s Affairs, 2009). Since total enrollment in the program throughout the state was 3,870 as of 2010 (Barnett et al., 2010), the number of actual pre-k classrooms is minimal. These classrooms can be found in a variety of settings aside from public schools.

This is not to say that Title I funded pre-k cannot be found in public schools as well (Gayl, Young, & Patterson, 2009). *Title I of the Education and Secondary Education Act* of 1965—the largest source of federal funds a school system receives—was written to ensure that all children have the opportunity to receive a high quality education. These funds can be used to help districts meet state standards (Matthews & Ewen, 2010). Early education with an emphasis on accountability is one of the options school systems choose for the disbursement of Title I funds (Currie, 2001; Warden, 1998).

Even though Title I pre-k classes are a less popular funding option for school districts than state or local funding (Gayl, Young, & Patterson, 2010), funding for pre-k is growing because of a growing focus on improving the nation’s education system (Matthews & Ewen, 2010). Although Title I pre-k is not a specified program, school systems are required to use the funds by following the *Improving Head Start for School Readiness Act* of 2007 Section 641A (a) (Matthews & Ewen, 2010). The *Head Start Act* Section 641A (a) has similar requirements to that of the state funded pre-k in Alabama, including using a research-based curriculum, using standards for learning, and providing meals. The similarities and differences between the characteristics of these two levels of the independent variable, pre-k, as identified in the research, are presented in Table 1.
Table 1

**Similarities and Differences of Federal and State Pre-k**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Title I Pre-k</th>
<th>State Pre-k</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Learning Standards</td>
<td>None standardized across programs but based in the Head Start Outcomes Framework</td>
<td>Comprehensive and standardized</td>
</tr>
<tr>
<td>Teacher Degree</td>
<td>None required</td>
<td>Bachelor’s required in early childhood or child development</td>
</tr>
<tr>
<td>Assistant Credentials</td>
<td>None required</td>
<td>CDA required or equivalent</td>
</tr>
<tr>
<td>Teacher In-service</td>
<td>None required</td>
<td>40 clock hours per year</td>
</tr>
<tr>
<td>Research-based Curriculum</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Adult: Child Ratio</td>
<td>None required</td>
<td>1:9</td>
</tr>
<tr>
<td>Health Screening</td>
<td>None required</td>
<td>Required</td>
</tr>
<tr>
<td>Ongoing Monitoring and Technical Assistance</td>
<td>None required</td>
<td>Required</td>
</tr>
<tr>
<td>Calendar</td>
<td>None required</td>
<td>180 student days/ 6.5 hours per day</td>
</tr>
<tr>
<td>Parent Enrichment</td>
<td>None required</td>
<td>12 hours per family</td>
</tr>
<tr>
<td>Meals</td>
<td>Required</td>
<td>Required</td>
</tr>
</tbody>
</table>

*Note.* Summary of characteristics of the two levels of the independent variable pre-k. CDA = child development associate degree.

Andrews and Slate (2002), Bierman et al. (2008), Burchinal et al. (2008), Gormley and Gayer (2005), Mashburn et al. (2008), and Wong et al. (2008) produced important research in the field of pre-k. The current study pulled together many important elements of these studies by incorporating state and federally funded programs in the same research. While each of the background studies showed significant effects on language, academic skills, and/or social competence, state funded programs were only...
compared to either state or private programs, while federally funded programs were examined for effectiveness. Gormley and Gayer (2005) examined state funded programs found in public schools. Wong et al. (2008) looked at five state programs where the classes were found in both public schools and a variety of other settings. Andrews and Slate (2002) compared a state funded program to private programs in a variety of settings. Burchinal et al. (2008) researched state funded programs in different settings, and Bierman et al. (2008) probed federally funded programs. The current research utilized factors of each of these studies by examining state and federally funded classes specifically in public schools.

Conn-Powers, Cross, and Zapf (2006) stated that mixed delivery services such as providing pre-k in Head Start, private centers, faith based centers, and public schools can build a bridge between private and public settings. This increases the quality of services offered in the private setting, improves the educational outcomes, and eases the transition to kindergarten. Conn-Powers et al. (2006) also stated that having the programs in public schools could result in more focus on readiness skills and alignment with school curriculum and standards. Andrews and Slate (2002) added that being located in a school setting with a school routine and a curriculum connection to the kindergarten classes is beneficial for the children who attend pre-k. The research presented is among the first performed on state and federally supported pre-k within Alabama since pre-k is a relatively new concept within the state and currently only 43 of 67 counties have state funded pre-k classes in public schools (Alabama Department of Children’s Affairs, 2009).
Research Questions

- Is there a statistically significant difference in the linear combination of ISF and LNF scores (i.e. phonemic awareness and letter knowledge) at the beginning of the year of kindergarten for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, and socioeconomic status?

- Is there a statistically significant difference in the linear combination of ISF, LNF, PSF, and NWF scores (i.e. phonemic awareness, letter knowledge, and phonics) at the middle of the year of kindergarten of children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, socioeconomic status, and beginning of the year ISF and LNF scores?

- Is there a statistically significant difference in the linear combination of LNF, PSF, and NWF (i.e. phonemic awareness, letter knowledge and phonics) scores at the end of the year of kindergarten of children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, socioeconomic status, and beginning of the year ISF and LNF scores?

Research Hypotheses in Null Form

$H_{01}$: There will be no statistically significant difference in the linear combination of ISF and LNF scores (i.e. phonemic awareness and letter knowledge) at the beginning of kindergarten for children who attended high quality, state supported
pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, and socioeconomic status.

H_{02}: There will be no statistically significant difference in the ISF scores (i.e. phonemic awareness) at the beginning of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, and socioeconomic status.

H_{03}: There will be no statistically significant difference in the LNF scores (i.e. letter knowledge) at the beginning of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, and socioeconomic status.

H_{04}: There will be no statistically significant difference in the linear combination of ISF, LNF, PSF, and NWF scores (i.e. phonemic awareness, letter knowledge, and phonics) at the middle of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, socioeconomic status, and beginning of the year ISF and LNF scores.

H_{05}: There will be no statistically significant difference in the ISF scores (i.e. phonemic awareness) at the middle of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to
children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, socioeconomic status, and beginning of the year ISF and LNF scores.

H₀₆: There will be no statistically significant difference in the LNF scores (i.e. letter knowledge) at the middle of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, socioeconomic status, and beginning of the year ISF and LNF scores.

H₀₇: There will be no statistically significant difference in the PSF scores (i.e. phonemic awareness) at the middle of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, socioeconomic status, and beginning of the year ISF and LNF scores.

H₀₈: There will be no statistically significant difference in the NWF scores (i.e. phonics) at the middle of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, socioeconomic status, and beginning of the year ISF and LNF scores.

H₀₉: There will be no statistically significant difference in the linear combination of LNF, PSF, and NWF scores (i.e. phonemic awareness, letter knowledge, and
phonics) at the end of the kindergarten for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, socioeconomic status, and beginning of the year ISF and LNF scores.

H_{10}: There will be no statistically significant difference in the LNF scores (i.e. letter knowledge) at the end of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, socioeconomic status, and beginning of the year ISF and LNF scores.

H_{11}: There will be no statistically significant difference in the PSF scores (i.e. phonemic awareness) at the end of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, socioeconomic status, and beginning of the year ISF and LNF scores.

H_{12}: There will be no statistically significant difference in the NWF scores (i.e. phonics) at the middle of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, socioeconomic status, and beginning of the year ISF and LNF scores.
Identification of Variables

There were two levels of the pre-k independent variable: (a) federally supported, public school pre-k, and (b) state supported, public school pre-k.

Federally supported, public school pre-k was defined as an educational program, located within a public school setting, for four-year-olds funded through Title I funds. These pre-k classes had to meet the requirements for receiving Title I funds (i.e. be located within a school that receives these funds) and were held to Section 641A (a) of the Improving Head Start for School Readiness Act of 2007.

State supported, public school pre-k was defined as an educational program located within a public school setting for four-year-olds funded through state resources. In order to continue funding, these classes had to follow the state guidelines, utilize the state performance standards for four-year-olds, and utilize a research-based curriculum.

The dependent variable of the research, reading readiness, had three levels: (a) letter knowledge, (b) phonemic awareness, and (c) phonics. Reading readiness was operationally defined as the acquisition of letter knowledge, phonemic awareness, and phonics skills as a result of exposure to a state- or federally-funded pre-k program, curriculum, and activities. The Dynamic Indicators of Basic Early Skills 6th edition (DIBELS) (Good & Kaminski, 2002) was used to assess the acquisition of these skills. The component probes of the DIBELS included Letter Naming Fluency (LNF), Initial Sound Fluency (ISF), Phoneme Segmentation Fluency (PSF), and Nonsense Word Fluency (NWF). Letter knowledge was operationally defined as the LNF subtest of the DIBELS (Good & Kaminski, 2002). Phonemic awareness was defined operationally as
the ISF and PSF subtests of the DIBELS (Good & Kaminski, 2002). Phonics was defined operationally as the NWF subtest of the DIBELS (Good & Kaminski, 2002).
CHAPTER TWO: LITERATURE REVIEW

Introduction

School readiness, particularly reading readiness, has been the subject of much debate in the field of early childhood education (Lundberg, 1998; McCormick & Mason, 1984; National Reading Panel, 2000; Welch & White, 1999; Wong et al., 2008). The importance of being ready to read is not under debate, but the optimal time for children to develop critical early literacy skills and whether or not this should be done prior to children entering formal kindergarten is (Massetti, 2009; Molfese et al., 2006; Whitehurst & Lonigan, 1998). Whitehurst and Lonigan (1998) found a child’s preschool age skills and their development to be strong predictors of future reading achievement.

The No Child Left Behind Act and the Reading First Act were federal responses to concerns about the educational achievement of all children (Molfese et al., 2006). Molfese et al. (2006) emphasized focusing on the preschool ages to improve academic achievement, particularly in the area of reading. Nationwide, states spent in excess of $5 billion on preschool education in the 2008-09 school years (Barnett et al., 2009). This did not include the billions spent by the federal government to support Head Start and other government subsidized programs (Barnett et al., 2009). While state and federal governments are increasing funding for pre-k initiatives (Barnett et al., 2009), the extent of services is often limited. Currently, Oklahoma and Georgia are the only states where virtually every child can attend pre-k (Barnett et al., 2009). However, West Virginia, Florida, and Massachusetts have committed to establishing universal pre-k (Gormley, 2005). Ten states still offer no state supported pre-k program (Barnett et al., 2010).
Furthermore, seven states serve fewer than 5% of four-year-olds. Thirty-six percent of public schools in the southeast offer full day pre-k while only 4% of schools in the central United States offered pre-k in the 2000-01 school year. Since 1989, enrollment in pre-k in the south has doubled (Andrews & Slate, 2002). With the growth and progress in funding for preschool access across the nation and the focus of research on improving readiness skills, the remainder of this literature review will focus on presenting information about the theoretical framework, historical perspective, and research concerning high quality preschool programs, school readiness, and reading readiness.

**Conceptual or Theoretical Framework**

The National Association of the Education of Young Children (NAEYC) lists three critical factors to be considered in early childhood education that make a good summary of the theoretical framework on which this study is based. In the School Readiness position statement, NAEYC (1995) stated:

> Readiness must consider at least three critical factors: the diversity of children’s experiences as well as inequity in experiences; the wide variation in young children’s development and learning; and the degree to which school expectations of children entering kindergarten are reasonable, appropriate, and supportive of individual difference. (p. 1)

In addition, the influences of Jean Piaget, Lev Vygotsky, Fredrich Froebel, John Dewey, Maria Montessori, and many others can be found throughout the field of early childhood education (Beatty, 2009; Powell & Kalina, 2009). Two overarching elements provide the context for the current research: cognitive and social constructivism. The idea that learning occurs within an individual based on his or her own background of
experiences, interaction with the environment, and current schema or understanding, is the foundation of cognitive constructivism (Powell & Kalina, 2009). In addition, social constructivism implies that learning occurs through social interaction and interaction with the environment. I approached the study through the framework of a combination of cognitive and social constructivism, just as Piaget (cognitive constructivism) and Vygotsky (social constructivism) had many overlapping ideas.

As Piaget continually developed his cognitive constructivism theory, he realized and included the social element (Beatty, 2009). However, the social elements included by Vygotsky were more prominently emphasized throughout the development of his learning theory. Both theories include elements of active education, recognize children as full of potential to learn, perceive the role of the child as that of a researcher, and recognize the importance of the environment and the interaction with it (Hewett, 2001). Vygotsky, though, brought out the emphasis of language and communicating with others more heavily than Piaget. However, both saw the child as being in control of his or her learning through interacting with the social and physical environments and adapting and learning through play and social situations (de Cos, 1997). This learning is facilitated by the teacher providing a stimulating environment that offers guidance and appropriate experiences to expand further development (de Cos, 1997). Children have innate knowledge fueled by curiosity and the drive for problem solving. Through interaction with people and the environment, children are continuously revising their knowledge by making, accepting, and rejecting hypotheses (Welch & White, 1999). This type of environment and these theories were used as the framework on which the current research was conducted.
Another aspect of the framework was the curriculum used. The selected school system used the High Scope pre-k curriculum. The High Scope curriculum uses a whole child approach with influences of cognitive and social constructivism that include child-initiated activities (Schweinhart & Weikart, 1999). The High Scope Perry Preschool project took place in Michigan between 1958 and 1962 and included 123 children (Belfield, Nores, Barnett, & Schweinhart, 2006). High Scope has been repeatedly shown to have cognitive and socio-emotional benefits (Barnett, 1996; Belfield et al., 2006; Schweinhart & Weikart, 1999). The cost benefit analysis shows a strong positive impact and reveals that for every dollar spent on pre-k, approximately $7 per child is saved through fewer remediation programs, fewer children placed in special education programs, higher graduation rates, higher earnings as adults, and lower incidences of crime (Barnett, 1996; Belfield et al., 2006).

Studies of the High Scope approach have also shown significant differences in areas of school readiness (Schweinhart, Barnes, & Weikart, 1993). The High Scope approach utilizes a set of “key experiences” that help adults support and extend children’s learning in a variety of areas such as social relationships, language, literacy, music, and mathematics. There is a consistent daily routine, including large and small group experiences. The approach requires careful daily planning on the part of the teacher. While it is similar to direct instruction methods, High Scope should be considered within the constructivist realm (Schweinhart & Weikart, 1998). The focus is not on adults’ use of scripted instruction specifically in the area of academics, but on childrens’ development and the provision of activities that support and extend learning to include the academic, social, emotional, and physical realms. The approach includes ongoing
assessment and progress monitoring, which provides the foundation for the extension and support of a child’s learning.

**Review of the Literature**

**Historical perspective.** Federal and state funds, as well as private funds, have been the financial means for pre-k programs throughout the United States (Barnett et al., 2009). The type and quality of the program ultimately depends on the kind of funding. Often federally funded pre-k is targeted at children from disadvantaged or at-risk situations (Andrews & Slate, 2002). Federally funded preschool often refers to Head Start programs, which began in the summer of 1965 (Zigler & Styfco, 1994) under the direction of President Lyndon Johnson’s administration (Zigler & Styfco, 2000). In contrast to their federally funded counterparts is privately funded programs that enroll mostly Caucasian children from high-income homes (Andrews & Slate, 2002). Furthermore, Head Start and other federal funds are used to focus on closing the gap in the education of disadvantaged children. Private programs have historically focused on educational enrichment and socialization. While Head Start was designed as a comprehensive service for children from at-risk homes, the federal government has never fully funded the program to make it available to all who are eligible (Witte & Trowbridge, 2005).

Another area of federal funds that is less utilized for pre-k comes from the *Title I Elementary and Secondary Education Act* of 1965 (Gayl et al., 2009). Title I provides funds to schools that serve disadvantaged children (Gayl et al., 2010). The funding is dependent upon the number of students in a school who qualify for free and/or reduced lunches (Matthews & Ewen, 2010). Schools are allowed to use Title I funds for pre-k if
the school is serving children who would normally attend that school upon reaching attendance age, and if the program focuses on raising the academic achievement of children once they enter school (Matthews & Ewen, 2010). Districts have not traditionally used this large source of funds for early education, but with increased accountability some districts are choosing Title I pre-k as a strategy to ensure children are prepared to enter kindergarten and have the background to meet future academic standards (Gayl et al., 2010). In order to use this funding source for early education a school system must only follow the Head Start Guidelines in Section 641A (a) (Matthews & Ewen, 2010), which deals with standards related to school readiness such as a scientifically based curriculum, health services, parent involvement, nutrition services, and transition to formal school (Head Start Act §641A (a)). These guidelines also emphasize the development of language and literacy such as phonemic awareness, print awareness, and alphabetic knowledge as well as development in math, science, social and emotional awareness, creative arts, and physical dimensions. There is currently not enough data to determine how many school districts are using Title I funds for this purpose, but in 2002 the Department of Education estimated that 2% to 3% of districts were (Gayl et al., 2010).

In both private and public preschools, enrollment has substantially increased over the last decade (Barnett et al., 2009). Currently almost 30% of four-year-olds attend a state funded pre-k program. When Head Start and early childhood special education are added, the number increases to 42%. The addition of private program enrollment for four-year-olds increases this number to 74%. In 1979, seven states offered public pre-k in the school systems (Mitchell, 1989) and grew to 10 states in 1980 (Morrisey &
In 2009, 40 states offered subsidized pre-k (Barnett et al., 2010). All 50 states offer Head Start and/or private pre-k programs. According to Witte and Trowbridge (2005) 45% of three- to five-year-olds from low-income families are enrolled in some type of program, compared to 75% of three- to five-year-olds from high-income homes. Public school pre-k is funded through federal, state, or local funds and encountered major expansion in the 1990s (Witte & Trowbridge, 2005).

**High quality pre-kindergarten.** According to Lazarus and Ortega (2007) the most effective means of improving academic outcomes is to provide quality pre-kindergarten. Gayl et al. (2010) endorsed quality programs as making critical differences in school readiness. All children are ultimately measured against the standards of *No Child Left Behind*; therefore, children should be given the opportunity to receive quality instruction at an early age and be ready for formal school expectations. Laosa (2005) suggested that universal, top quality pre-kindergarten has the potential to improve school readiness in children from all races and economic backgrounds.

Gormley and Gayer (2005) suggested that universal pre-k may be more likely to attract parents and students of some races and socioeconomic backgrounds than others. Caucasian and mid-level income households choose universal pre-k more often than other races and income levels (Barnett et al., 2008). Laosa (2005) implied that the aim of universal or voluntary pre-k is for children to acquire a set of skills and behaviors that is necessary for school success. This leads to the possible conclusion that minority parents from low-income or lower educational backgrounds are less likely to enroll their children in a quality pre-k than parents of higher socio-economic or higher education backgrounds. Furthermore, many programs focus on specific populations of children due
to the type of funding received. It is possible that the focus on specific populations may lead to the over or underrepresentation of certain races or socioeconomic statuses in the current research.

One possible conclusion from a review of the research is that pre-k must be of high quality to promote maximum benefits. NIEER (Barnett et al., 2008) defined high quality as a program utilizing standards for four-year-olds, teacher and assistant credentials, professional development, competitive compensation, low teacher/child ratios, health screenings, meals, and program evaluation. Clifford et al. (2005) included program length as a measure of quality. Barbarin et al. (2006) added that the assets educators determine to be quality and those that parents determine to be quality often differ. Barbarin et al. further emphasized that parents cite teachers’ experience and their relationships with children as central to quality. Mashburn and Pianta (2006) also suggested that parents refer to their children learning letters, numbers, and colors as an aspect of program quality. Research could be conducted to determine the effectiveness of pre-k based on elements that parents determine high quality, rather than quality as defined by educators.

Mashburn et al. (2008) posited that quality falls into two categories: program design and aspects of the classroom environment (direct experiences). Mashburn et al. (2008) further defined program design as including features of the NIEER definition (Barnett et al., 2008). However, no mention has been made of what direct experiences include. One can assume from the research that routines, activities, lessons and interactions are included (Barnett et al. 2008; Burchinal et al., 2008; Mashburn & Pianta, 2006; Mashburn et al., 2008). It cannot be deduced, however, exactly what constitutes
quality in these experiences. Gormley and Gayer (2005) found that Tulsa’s high quality pre-k program had a significant impact on increased cognitive skills and language in Hispanic and African American children, as well as in children who qualify for free lunch. They only found minimal effects for Caucasians (Gormley & Gayer, 2005). The differences that emerged from these studies raises the question as to whether the differences are due to variations in the understanding and perspectives of program quality. In reference to earlier ideas that universal pre-k attracts Caucasian and middle-income families more than others, should it be concluded that universal pre-k may not really be universal?

According to studies conducted by Clifford et al. (2005), Gormley and Gayer (2005), Mashburn and Pianta (2006), Mashburn et al. (2008), and Vu, Jeon, and Howes (2008), program quality depends on a number of variables. Clifford et al. (2005) found that it was hard to rate program quality in part time or half day programs because of the reduced amount of teachers’ discretionary time. Vu et al. (2008) indicated that not only do teacher credentials affect program quality, but the pre-k director’s credentials as well. Vu et al. (2008) found that quality was affected by the credentials of teachers and directors in private centers and Head Start programs at a higher degree than in public school pre-k classes. Education and teacher training have been shown in the research to be strong predictors of the quality of the pre-k environment (Lara-Cinisomo, Fuligni, Ritchie, Howes, & Karoly, 2008).

Research shows that teachers are better able to support developmentally appropriate practices and school readiness when they hold at least a Bachelor’s degree and have specialized training in early childhood (Bueno, Darling-Hammond, & Gonzales,
This specialized training and education improve teacher-child interactions that promote cognitive, social, and emotional growth (Barnett, 2004). Skilled teachers are able to create a more cognitively stimulating and language rich environment (Bueno et al., 2010). It has been noted that the field of early childhood education often pays low wages (Barnett, 2003). Requiring teachers to hold a degree or specialized training supports higher compensation and easier recruitment of qualified individuals (Bueno et al., 2010). Higher compensation also reduces turnover, which improves program quality. Pre-k teachers in public schools are usually paid based on the state teacher salary matrix and therefore receive salaries and benefits like those of their k-12 colleagues. The area of concern with program quality seems to be the differences in factors such as utilizing standards for four-year-olds, teacher and assistant credentials, professional development, competitive compensation, low teacher/child ratios, health screenings, meals, and program evaluation that determine high quality pre-k. Furthermore, the studies indicate credentials to be a factor in quality, but there is no agreement on the level of education needed in order to be effective. The generally accepted definition of a high quality program and the definition used for the current research were developed by NIEER and include teacher-to-student ratios, teacher and assistant credentials, standards, professional development, health screenings, and meals provided (Barnett et al., 2010).

In the State of Preschool 2008 Yearbook (Barnett et al., 2008) evidence is presented that the 2007-08 school year saw expansion, progress, and higher standards in pre-kindergarten. The trend for growth has continued through the 2009-10 school year (Barnett et al., 2010). This yearbook only reviews state supported programs (40 states have state supported programs); therefore, no information is provided concerning Title I,
Head Start, privately funded programs, or other pre-k providers (Barnett et al., 2010). Barnett and Robin (2006) provided evidence that even though there is growth in the number of children attending state funded pre-k (an increase of more than 100,000 children from 2002 to 2005), there are concerns about program design and program cost.

The funds provided by state sources impact the number of children in pre-k as well as the quality of the program. This also holds true for private and federally funded programs. Historically, federally funded programs have attracted minority, low-income families, while state supported programs have attracted Caucasian, middle-income families. The state supported programs in the Barnett et al. (2010) research hold programs to higher standards both for teachers and a number of other areas. Despite the fact that programs are available to all races and socioeconomic levels, they may not be of equal experiential quality for all students.

While state supported pre-k varies by state (Barnett et al., 2008), the federal government spends over $7 billion each year on center-based child care (Magnuson et al., 2007), not including Title I funds (Matthews & Ewen, 2010). Magnuson et al. (2007) indicated that federal funds are divided between programs like Head Start, CCDF, and TANF. Many of the programs range in hours and days of operation, teacher credentials, and experiences provided. These federally funded programs are often the only option for low-income families since private child care can cost in excess of $6,000 per year (Magnuson et al., 2007). In addition, the federal government provided in excess of $27 billion in Title I funds to schools in 2009, but only a small portion was spent on pre-k initiatives in public schools (Gayl et al., 2009).
Taylor, Gibbs, and Slate (2000) reported that in states like Georgia, where a high proportion of the budget is spent on pre-kindergarten, few studies have focused on the effects of pre-kindergarten and preparing children for school. However, in the Taylor et al. (2000) study in Georgia, children who attended publicly funded pre-kindergarten scored significantly higher on the Georgia Kindergarten Assessment Program than children who did not attend any pre-k at all. This is similar to Gormley and Gayer (2005), who found that Tulsa’s children performed better on state kindergarten assessments when they attended a publicly funded pre-k. These studies assumed that performance on state tests in kindergarten were an indicator of school readiness and only performance levels in kindergarten were evaluated. As a result, only cognitive skills were included, and equally important is the aspect of behavioral and social competencies which should be included in further studies.

The effect of high quality pre-k on school readiness varies depending on the definition of school readiness and the aspects of quality considered in the pre-k program. Janus and Duku (2007) explained that even though a child may exhibit the skills necessary for school, school readiness is really about how children use the skills they have acquired. LaParo and Pianta (2000) found supporting evidence that limiting school readiness to specific cognitive skills provides little support that academic achievement will be sustained in later school years. However, Perry (1999) argued for more quality pre-k in public schools to serve children entering kindergarten who have had no prior experience. Pre-k quality and its effectiveness of preparing children for school can be debated infinitely; moreover, the meaning of school readiness can also be debated.
**School readiness.** School readiness is a complex phenomenon that has been defined in many different ways over the years (Welch & White, 1999). School readiness measures prior to 1990 only included cognitive skills, for example, oral language, phonological awareness, and numeracy skills. According to Kagan (1992), school readiness in the 1990s revealed a more broad definition than that formerly used. The revised definition included a social emotional component (Janus & Duku, 2007). The more recent definition gave importance to the development of social-emotional competence, as well as the ability to use those skills. Villares, Brigman, and Pelusa (2008) added that problem solving and cooperation, in addition to cognitive skills, have the potential to affect attitudes and behaviors that children associate with school. School readiness implies that young children are prepared for k-12 success (Lara-Cinisomo et al., 2007).

Mashburn et al. (2006) and Lara-Cinisomo et al. (2007) implied that these definitions continue to be limited because they do not give credence to childrens’ dependence on opportunities to support further acquisition of social and cognitive competencies. Ladd, Herald, and Kochel (2006) emphasized in their school readiness study that there are interpersonal skills that should be components of school readiness. This implies that these interpersonal skills could offer evidence of later school success. School readiness incorporates an overabundance of skills and attitudes; it is possible that there are more facets to school readiness than have been considered in the research up to 2011.

Bierman et al. (2008) revealed demands on children as they entered kindergarten to be a time of learning compliance with rules, positive social interactions, and sustained
behavior control and time constraint. Ladd et al. (2006) added that the ability to sustain task involvement, participate cooperatively, and comply with class expectations increases these demands. In addition, the demands placed on children in education have grown significantly throughout the years. Perry (1999) emphasized that kindergarten is more academic and structured than ever because of the accountability and pressures on schools to produce high test scores. It is still arguable that the development of self-control may be as important as cognitive development in providing pre-k education (Currie, 2001).

Schools provide a number of challenges for children in the physical, intellectual, and social realms that are unfamiliar. With these thoughts in mind, public school pre-k has the ability to aid children with the transition skills needed to transfer more smoothly into kindergarten and to positively impact future success.

When social and emotional dimensions are emphasized in pre-k, de Cos (1997) suggested that there are more positive effects in later academic achievement. Historically, kindergarten was the time in a child’s life when the focus was on social and emotional domains, but kindergarten has become much more academic in this age of accountability. De Cos also stressed that universal pre-k can assist children and families with the transition to the social and emotional expectations of kindergarten and help diminish the differences in social and emotional development.

In a survey by the Public Policy Forum (2009) it was found that a majority of the kindergarten teachers surveyed felt that social and emotional development in addition to cognitive development, general knowledge, and language, were determined to be very important contributors to success in kindergarten. Gayl et al. (2009) suggested that high quality pre-k contributes significantly to social and emotional gains that allow children to
be more successful throughout their school careers. According to Gayl et al., a Chicago pre-k project showed greater gains in reading and math, lower grade retention, and fewer children placed in special education through sixth grade. The development of the socio-emotional skills and their long term effects on school success have also been shown in the Perry Preschool Project (Belfield et al., 2006) and the Abecedarian Project (Currie, 2000) through lower grade retention, fewer placements in special education, lower crime rates, and lower support on welfare through adulthood.

Magnuson et al. (2007) speculated that preschool attendance increases school readiness in the academic realm and that the effects are more persistent with children from disadvantaged homes. School readiness is affected by socioeconomic status, lack of socialization, health issues, disabilities, and personality (Ladd et al., 2006). Mashburn and Pianta (2006) pointed out that school readiness as a characteristic is limited because it does not identify the process through which children go to acquire the necessary competencies. They further suggested that the social relationships formed between the child, parent, and teachers determine whether children acquire school readiness skills (Mashburn & Pianta, 2006). Burchinal et al. (2008) found that there were significant effects in the areas of school readiness, including social skills, language, and reading, but not in the area of math.

Shephard and Smith (1986) stated that more than three million children begin kindergarten each fall and that the differences in their readiness to learn are tremendous. Kindergarten teachers in Milwaukee felt strongly that those who attend pre-k are more likely to do better in kindergarten and beyond (Public Policy, 2009). Taylor et al. (2000) suggested that attendance in a preschool program results in higher grades, higher
achievement, and a lower likelihood of being retained in a grade or placed in special education. Early education implies a type of care that is not only responsive to a child’s physical and emotional needs, but also implies cognitive care (Magnuson et al., 2007). Magnuson et al. (2007) found that attendance in a preschool program significantly increases academic school readiness. These results are similar to the findings of the Taylor et al. (2000) study seven years earlier.

In a publication by Pre-k Now concerning Title I pre-k (Gayl et al., 2010), it was indicated that pre-k assists children and families in the area of school readiness by providing for a seamless transition to kindergarten. The pre-k classes that are aligned with an elementary vision can be considered a school readiness reform effort and help children have the social and emotional background experiences that allow for future school success and help reduce academic achievement gaps between groups of students. In Elk Grove, California, significant gains were realized in reading and math through third grade for children who attended pre-k as opposed to those who did not.

Kindergarten has become so academically oriented because of accountability measures, and pre-k is one way of helping children be prepared for academic demands, structure, routine, and experiences (Perry, 1999). According to Pratt (1997), studies suggest that children in high quality pre-k achieve at higher levels and also develop an attitude to learning that aids them throughout school. Campbell and Ramey (1994) found that school readiness and kindergarten success is increased when children attend a literature rich pre-k. Early et al. (2001) maintained that high quality pre-k results in a successful transition to kindergarten and formal elementary school. Teachers of pre-k should take steps to increase transitional success by introducing children and families to
kindergarten teachers, allowing pre-k children to visit kindergarten classes, read stories, and sing songs that are used in kindergarten as well as a host of other activities (Kraft-Sayre & Pianta, 2000). This supports the stance of the National Educational Goals Panel (1998) that school readiness is in the child, in the school, and in the family/community support structure. In a survey of kindergarten teachers (Public Policy Forum, 2009) 97% felt they could identify children early in the school year who had attended pre-k. These same teachers felt that pre-k was very important to success in kindergarten. Stuber and Patrick (2010) indicated that pre-k teachers should be used to build a stronger bridge to k-12.

Lara-Cinisomo et al. (2007) used focus groups to analyze important aspects of school readiness. The study was based on pre-k as designed to improve children’s chances for future school success and that beliefs about elements of school readiness were critical to future performance. While some differences in elements of school readiness existed, the focus groups agreed that pre-k should address multiple levels of a child to help the transition to school, and programs should emphasize social and academic skills. Also, educators and parents should help ensure children are ready for social and academic expectations and challenges in school.

Combining the results of these studies implies the possibility that there may be more extraneous variables than can be accounted for in one study. Each study defines quality and readiness in a variety of ways. Each study reviewed implies that quality is a contributing factor to school readiness regardless of the definition of quality. Molfese et al. (2006) contended that pre-k was a critical time to meet the needs of children who may have gaps in their cognitive development, especially in reading readiness.
**Reading readiness.** Reading readiness focuses on the development of skills and attitudes that are predictors of later reading success and achievement (Whitehurst & Lonigan, 1998). These skills include phonological awareness, alphabet knowledge, and concepts of print. Bierman et al. (2008) supported the notion of reading readiness skills as the foundation of success with formal reading instruction that begins in kindergarten and first grade. Fischel et al. (2007) suggested that pre-k provides the opportunity for the development of these skills. These skills help develop the motivation needed for later academic success. Furthermore, Fischel et al. (2007) emphasized that phonological awareness, concepts of print, alphabet knowledge, and oral language are the skills necessary to be a successful reader. This is supported by Bierman et al. (2008) and Fien, Kame’enui, and Good (2009), who stated that the development of these skills is the foundation for success with later formal reading instruction.

Molfese et al. (2006) contended that there is growing evidence that the development of reading readiness skills in the preschool ages affects achievement in elementary school. Children who develop alphabet knowledge skills perform at higher levels on kindergarten and first grade phonological awareness and word reading assessments. Good, Gruba, and Kaminski (2001) emphasized that fluency in letter naming is a strong indicator of the development of other reading skills that lead to reading success. Fien et al. (2009) also supported letter naming as the most stable predictor of later reading performance. Muter and Diethelm (2001) found that letter knowledge is the marker of reading skill development in English and non-English speaking children. Others noticed that research supports the relationship between alphabet knowledge and phonological awareness (Good et al., 2001; Molfese et al., 2006;
Simmons et al., 2000). Further, a relationship can be found between the development of these skills in preschool and reading skills in traditional elementary school. Children who develop the skills to be successful readers become successful readers (Massetti, 2009). These children read well and read more, which affects their learning in other subject areas.

The National Reading Panel (2000) found that reading readiness requires foundational knowledge such as concepts of print, phonemic awareness, and letter naming prior to formal reading instruction. Lonigan, Burgess, and Anthony (2000) demonstrated that phonological and print awareness are two critical areas that predict reading success in later school years. One can conclude that the pre-k environment should offer opportunities for children to develop skills in letter identification, phonemic awareness, and concepts of print in order to be successful readers in elementary and later school years.

According to the National Reading Panel (2000), phonemic awareness and letter knowledge are the two best predictors of future reading acquisition. Phonemic awareness refers to the ability to focus on or hear sounds or phonemes and manipulate the phonemes in spoken words (Good et al., 2001). This includes a conscious control of the sound structure so that the sounds can be manipulated, substituted, and recombined (Lundberg, 2009). Phonemic awareness can be developed through active engagement in sound manipulation experiences whether through songs, stories, play, or direct instruction (Cooke, Krestlow, & Helf, 2010). Phonemic awareness is one of the two best predictors of reading acquisition and is thought to contribute to reading success because the American system of print is alphabetic (National Reading Panel, 2000). According to
Lundberg, Olofsson, and Wall (1980) there exists a strong relationship between phonemic awareness and successful reading. Lundberg (1998) supported phonemic awareness as a basic prerequisite for becoming a successful reader. This is a critical enabling skill for reading acquisition (Lundberg, 2009).

Young children learn concepts of reading prior to formal school (McCormick & Mason, 1984). There exists a hierarchy of pre-reading concepts, including concepts of print or the knowledge that spoken words can be written as well as letter-sound characteristics. Reading readiness requires fundamental knowledge such as these concepts of print and letter knowledge prior to formal reading instruction (National Reading Panel, 2000). Lundberg (1998) stated that “once the alphabetic principle is grasped the child is equipped with a powerful self-teaching mechanism for further exploration of the print environment where the reading skill is developed and refined” (p. 156). Children gradually construct the idea of the symbol-language relationship and come to realize this relationship through the exposure to books and the written language (Lundberg, 1998).

Good et al. (2001) implied that alphabetic principles include alphabetic understanding and recoding strings of letters into sounds that can then be blended into words. Only recently has it been realized how much information children can acquire about print before formal instruction and how it affects the success of the instruction they receive after beginning their formal school careers (McCormick & Mason, 1984). Later reading success is influenced by the proficiency of emergent reading skills (National Reading Panel, 2000).
The National Reading Panel (2000) provided evidence of the skills, experiences, and knowledge children need in order to become successful readers. Young children need to develop the early literacy skill of phonemic awareness, alphabetic understanding, and automaticity with code in order to be on track to attain later formal reading outcomes (Simmons et al., 2000). Good et al. (2001) argued that since improved reading achievement of all children is a national, state, and local school district goal, a good strategy is to prevent reading difficulties from the beginning. Molfese et al. (2006) contended that high quality pre-k provides children with experience in the critical reading skills that address this problem. Good et al. (2001) also recognized utilizing a valid and reliable assessment system that provides information on these important skills and allows educators to plan appropriate future reading instruction. These deficiencies in early literacy skills must be identified prior to the time a child should have met a standard in order to modify formal reading instruction to assist children in acquiring the essential reading skills.

**Role of demographics in the literature.** Early childhood programs have been encouraged to emphasize early reading skills for all populations of children, including at-risk, low SES, and minorities (Witte & Trowbridge, 2005). The at-risk category often includes populations with low SES and minorities (Clifford et al., 2005). One goal of pre-k is to improve early educational experiences so that all children may enter school healthy and ready to learn (Bryant et al., 2003). Governments (federal, state, and local) often support pre-k based on the grounds of equity for at-risk populations (Currie, 2001). Evidence is consistent that these variables of demographics may be considered at-risk factors that impact the success of children early in their school career (Janus & Duku,
Janus and Duku (2007) further suggested that these at-risk factors seem to follow the individual into adulthood. A review of literature revealed that the effects of pre-k are often greater for disadvantaged children (Currie, 2001), especially children of families in poverty (Conn-Powers et al., 2006).

Socioeconomic variables reliably correlate to educational outcomes (Janus & Duku, 2007). Janus and Duku (2007) reported that being economically disadvantaged is strongly correlated with lower cognitive outcomes through the third grade. Children from low SES are targeted in many pre-k programs (Mashburn, Justice, Downer, & Pianta, 2009). For example, in North Carolina almost half of pre-k funds are spent on child care subsidies for the poor (Bryant et al., 2003). Many governments and pre-k programs invest funds in targeting low SES based on the support of research that pre-k enhances readiness for school, especially in children at risk of educational difficulties because of poverty (Barbarin et al., 2006; Gormley & Gayer, 2005). Children raised in poverty stricken situations are particularly likely to experience difficulties in school (Bierman et al., 2008). These children are often identified as poor readers. This is exacerbated by the lack of home learning opportunities such as stimulating conversations and interactions as well as emotional support (Bierman et al., 2008).

In the Henry et al. (2003) study on Georgia pre-k, children from economically disadvantaged backgrounds began pre-k scoring below the national norms on tests of reading and math. After pre-k, this same group began kindergarten scoring above the national norms. Burchinal et al. (2008) revealed low-income children scored below national norms on language and academic tests at the beginning of pre-k. Burchinal et al. (2008) used the demographic related covariates of gender, race/ethnicity, maternal
education and English as a second language. After adjusting for the covariates, children were determined to score at significantly higher levels than their counterparts who did not attend pre-k. Magnuson, Meyers, Ruhm, and Waldfogel (2004) reported that children from low SES backgrounds benefitted more from pre-k than children from more advantaged backgrounds. This was due to the data showing significant differences between the groups existing at the beginning of pre-k, but no differences were noted at the end of pre-k. In a study by Bryant et al. (2003) poverty was a strong predictor of lower scores on reading, math, and language. Mashburn et al. (2009) attributed risk of academic deficiencies to low SES but supported public pre-k as having the potential to decrease the achievement gap.

Another demographic variable often controlled in the literature is race/ethnicity. The perspective from which a family judges pre-k program quality often differs by ethnicity and poverty status (Barbarin et al., 2006). Race/ethnicity may be associated with differences in language, values, and experiences that effect how families perceive quality pre-k. Andrews and Slates’ (2002) findings were statistically significant regarding kindergarten readiness as a function of ethnicity. In all areas (reading, math, and language) Caucasians scored at significantly higher levels than other races. Wong et al. (2007) evaluated five state pre-k programs and concluded that there are similar findings within studies in the case of race and poverty. Clifford et al. (2005) found that programs targeting low SES had a higher percentage of African American and Latino students than the population at large. African American and Latino children were more likely to be identified as low SES. It is often difficult to separate race/ethnicity from socioeconomic status. Providing pre-k targeted for low SES is often viewed as a way to
lessen the achievement gap between poor and non-poor groups as well as between Caucasian and non-Caucasian groups. Gormley and Gayer’s (2005) findings revealed minorities of low socioeconomic status in the Tulsa pre-k benefitted most.

The last demographic variable to be presented based on the literature review is gender. Gender is not considered an at-risk factor by itself (Mashburn et al., 2009), but when combined with race/ethnicity and SES, there can be an effect that bears further consideration (Janus & Duku, 2007; Reed et al., 2007). Janus and Duku (2007) analyzed pre-k data for contributions to an identified achievement gap that included five areas of at-risk factors as well as age and gender. The researchers found that males from low SES households were twice as likely to be identified as at-risk for difficulties with success at school entry as females. In a study on the North Carolina Smart Start pre-k program, Bryant et al. (2003) found that boys scored significantly lower than girls on reading and math. Throughout many studies presented in this literature review, gender, SES, and race/ethnicity were controlled in the analyses (Andrews & Slate, 2002; Bryant et al., 2003; Burchinal et al., 2008; Gormley & Gayer, 2005; Janus & Duku, 2007; Mashburn et al., 2008). While all three demographic variables were not always found to contribute to significant differences, the emphasis of the possible influence on outcome data was presented. These studies (Andrews & Slate, 2002; Bryant et al., 2003; Burchinal et al., 2008; Gormley & Gayer, 2005; Janus & Duku, 2007; Mashburn et al., 2008) used the variables of gender, race/ethnicity, and socioeconomic status either as independent or covariate variables. The pre-k study to be outlined and discussed in-depth in chapters three and four was influenced by these studies.
Summary

While pre-k has been shown to be effective for different populations of children (Burchinal et al., 2008; Early et al., 2007; Magnuson et al., 2007; Mashburn & Pianta, 2006; Molfese et al., 2006; Wong et al., 2008), effectiveness can be interpreted in a variety of ways. The idea of early childhood care is not new, but after President Bush’s Goals 2000, the emphasis on high quality pre-k was renewed. High quality is another term that can be interpreted differently by different groups of people (Barbarin et al., 2006; Barnett et al., 2009; Clifford et al., 2005; Gormley & Gayer, 2005; Mashburn & Pianta, 2006; Mashburn et al., 2008) but it seems to be agreed that quality, no matter the exact definition, is an important facet. Currently, billions of dollars of federal, state, and local resources are being spent on pre-k to promote school readiness (Barnett et al., 2009). More high quality pre-k in public schools, staffed with well-trained teachers using developmentally appropriate practices will help children reach the first goal of Goals 2000 (Perry, 1999). Chapter Three will outline the research design to add to the literature in the area of state and federally supported public school pre-k in the area of reading readiness.
CHAPTER THREE: METHODOLOGY

Introduction

This causal comparative study sought to determine if there was a significant difference in the reading readiness of kindergarteners who attended two types of public school pre-k in Alabama: federal and state funded programs. The purpose of the study was to examine these two levels of public school pre-k programs and contribute to the body of research that supports high quality pre-k as being important to the development of four-year-olds’ reading readiness upon completion of kindergarten. This chapter will present information regarding the participants, setting, instrumentation, procedures, design, and analysis of the data on a school system in east central Alabama. The research specifically addressed the question of significant differences in the reading readiness of kindergarteners who attended public school pre-k, either state or federally supported.

Participants

The participants identified for the study consisted of a convenience sample of children who were enrolled and attended pre-k in the 2007-08 and 2008-09 academic years in each of four elementary schools located within a single school system in east central Alabama. The students are now attending one of six similar elementary schools within the same school system. Children must have been four years old on or before September 1 of their pre-k year in order to be eligible to participate. All children who attended pre-k were zoned to attend kindergarten within the system; however, it was not necessarily the school where they attended pre-k. Eighteen children were enrolled in each pre-k class. Therefore, the 72 children from the 2007-08 class and 72 children from
the 2008-09 class made for a total of 144 participants. Seventy-two children attended state supported, public school pre-k and 72 children attended federally funded, public school pre-k. Thirteen students were excluded from the research because they withdrew from the system during or prior to their kindergarten year. Children were racially, ethnically, and socio-economically diverse. The sample consisted of 29.77% African American students and 64.89% Caucasian students. Of the sample, 5.34% were from a race other than the two listed above. The socio-economic status of the students was also diverse. The school system population was approximately 60% low-income as identified through the free/reduced lunch program. This was reflected in the participant population as well, with 50.38% of participants qualifying for free or reduced lunch. Race, gender, and socioeconomic status were identified as possible confounding variables and were controlled through the use of MANCOVA.

Setting

The setting of the study was a small school system in east central Alabama. The system was rural, with approximately 4,000 students. There were six elementary schools, two middle schools, and two high schools. The school system was accredited by the Southern Association of Colleges and Schools (SACS) for pre-k through 12th grades. Four of the elementary schools had pre-k classes in the 2007-08 and 2008-09 school years. The pre-k students were chosen by a lottery system because there was more four-year-olds seeking pre-k than there were classes available to them. Parents submitted an application of interest during a specified window of time in the spring, and children were randomly assigned numbers. Numbers were drawn to select the 18 children per class. Numbers continued to be selected beyond 18 in order to create a waiting list used to fill
openings that occurred during the school year. Two of the pre-k classes were state funded through the Office of School Readiness, and two classes were funded through Title I federal funds. The state funded classes were held to the *Alabama Standards for Four Year Olds* (Alabama Department of Children’s Affairs, 2004) as well as other state guidelines (Alabama Department of Children’s Affairs, 2009). The federally funded classes used Section 641A (a) of the Head Start Guidelines (Matthews & Ewen, 2010).

This setting was chosen because this system was one of the few in the region that had state funded pre-k and federally funded pre-k within the public schools. These classes were mutually exclusive: State funded teachers taught in state funded sites and federally funded teachers taught in Title I sites. Children enrolled in state funded units only attended state programs during the time they were enrolled in pre-k, and children enrolled in federally funded units only attended federal programs during the time they were enrolled in pre-k. I chose to include two years of pre-k classes to increase the sample size. Prior to 2007, the school system only had one state funded pre-k and four federally funded classes.

In each of the pre-k classes, the lead teacher held at least a minimum of a Bachelor’s degree in early childhood education. A degree is not required in federally funded programs, but these classes were located within a public school. Public school requires all teachers hold a minimum of a Bachelor’s degree. The range of lead teacher experience beginning in 2007-08 was from two years to more than 25 years. The same four teachers were employed in both the 2007-08 school year and the 2008-09 school year. The two teaching assistants in the state-funded classrooms were required to hold a minimum of a Child Development Associate certificate and had received High Scope
training. The two teaching assistants in the federally funded classes had no specialized training in the area of early childhood with the exception that both received High Scope training, and both met the state definition of “highly qualified” support staff. All four pre-k classes maintained an Early Childhood Environmental Rating Scale - Revised (ECERS-R) score of five or higher during the 2007-08 and 2008-09 school years. The scale for the ECERS-R is a measure of one (inadequate) to seven (excellent). A score of five or higher is considered to be in the category of good to excellent. All four pre-k classes used the High Scope curriculum, a scientifically research-based early childhood curriculum (Belfield et al., 2006; Schweinhart & Weikart, 1999). High Scope is a commonly used early childhood curriculum in pre-k and Head Start classrooms (Mashburn et al., 2008).

Each class met for 180 days for a minimum of six and a half hours per day. In state funded classrooms, parents were required to volunteer or attend parent enrichment workshops for a minimum of 12 hours per year. No such requirement was implemented in the federally funded classes. Daily schedules for all classes included whole group and small group activities, plan/do/review as described in the High Scope curriculum, and music/movement activities. All activities were centered around the Key Developmental Indicators as described in the High Scope curriculum. All classes followed the bell schedule for the particular elementary school in which they were located. In state funded classes, children were required to have health screenings prior to enrollment. Technical assistants from the Office of School Readiness observed in state funded classes to provide professional development to teacher and assistant throughout the school year in the areas of identified need. No such resource was provided the federally funded classes.
Instrumentation

Because levels of reading readiness were identified as the dependent variable (specifically the elements of letter knowledge, phonemic awareness, and phonics), the Dynamic Indicators of Basic Early Literacy Skills 6th edition (DIBELS) (Good & Kaminski, 2002) was the measure used. DIBELS was created by Good and Kaminski (2002) at the University of Oregon. The measure was developed to monitor early reading skills in children to provide needed intervention and to evaluate the acquisition of critical early reading skills (Good et al., 2001). This assessment is used to predict childrens’ acquisition of essential literacy skills with 80% probability of achieving the next reading goal (University of Oregon Center on Teaching and Learning, 2008b). The measure is centered on phonological awareness, alphabetic principle, accuracy and fluency. The DIBELS was selected because its measures evaluate the acquisition of early reading skills that were identified in research as necessary for later reading success (Elliott, Lee, & Tollefson, 2001; Fischel et al., 2007; Molfese et al., 2006). These measures also help to predict future problems and allow educators to have the appropriate information to implement effective interventions to prevent future reading problems (Good et al., 2001). The DIBELS assessment can be used repeatedly and is an economical and simple assessment to administer (Good et al., 2001). Each subtest takes approximately one minute to administer per child and corresponds to the five big ideas of reading as identified by the National Reading Panel (Simmons et al., 2000). Furthermore, Alabama state requirements are that DIBELS be administered in kindergarten through third grades, and the state provided training to local education agencies (LEA) through the Alabama Reading Initiative (ARI) on the administration and analysis of DIBELS.
The subtests used in the current study were Initial Sound Fluency (ISF), Letter Naming Fluency (LNF), Phoneme Segmentation Fluency (PSF), and Nonsense Word Fluency (NWF) (University of Oregon Center on Teaching and Learning, 2008b). ISF was used in the beginning and middle of the kindergarten year. LNF was measured three times in kindergarten. PSF and NWF were both administered in the middle and end of the kindergarten year. The subtest of LNF is a measure of letter knowledge and concepts of print (Fien et al., 2009). Two of these subtests address phonemic awareness: ISF and PSF. ISF measures the ability to produce and identify the first sound in a word. PSF assesses the ability to produce each sound individually in a word. NWF is a measure of alphabetic principals and phonics that examines letter-sound correspondence and the ability to blend the sounds together to make nonsense words (e.g. nim, laz, and mab) (Fien et al., 2009). NWF isolates how well students are able to apply phonics rules in decoding (Good, Baker, & Peyton, 2009). The instruments and the benchmark goals for each subtest are listed in Table 2.

Each DIBELS measure has no identified ceiling since the score depends solely on the number of letters or sounds a child can produce in the specified time frame of the assessment (Good & Kaminski, 2002). At the beginning of the year a score of zero to eight is expected for LNF and ISF. Any score above eight is considered high. A score of one or below on ISF and three or below on LNF is considered low. At the middle of the year a score of nine or below on ISF, 14 or below on LNF, six or below on PSF, and four or below on NWF is considered low. A score above 25 on ISF, above 27 on LNF, above 18 on PSF, and above 13 on NWF is considered high. The end of the year scores of 28 or below on LNF, nine or below on PSF, and 14 or below on NWF is low. An end of the
year score above 40 on LNF, above 35 on PSF, and above 25 on NWF is high (see Table 2).

Benchmark goals, as listed in Table 2, represent minimum levels of performance in order to be on track for becoming a proficient reader (University of Oregon Center on Teaching and Learning, 2008b). This table represents research-based, criterion referenced scores for probability of achieving early reading goals. Scores are listed in two different forms: (a) at risk, some risk, and low risk; and (b) deficit, emerging, and established. The first is used to identify whether a child is on track to reach the goal by the time the skill should be firmly established. The second refers to the point in time when the child should be established in the skill in order to become a fluent reader (University of Oregon Center on Teaching and Learning, 2008b).
<table>
<thead>
<tr>
<th>DIBELS Measure</th>
<th>Beginning of Year</th>
<th>Middle of Year</th>
<th>End of Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISF</td>
<td>0-3 at risk</td>
<td>0-9 deficit</td>
<td>Not Administered</td>
</tr>
<tr>
<td></td>
<td>4-7 some risk</td>
<td>10-24 emerging</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 and above low risk</td>
<td>25 and above established</td>
<td></td>
</tr>
<tr>
<td>LNF</td>
<td>0-1 at risk</td>
<td>0-14 at risk</td>
<td>0-28 at risk</td>
</tr>
<tr>
<td></td>
<td>2-7 some risk</td>
<td>15-26 some risk</td>
<td>29-39 some risk</td>
</tr>
<tr>
<td></td>
<td>8 and above low risk</td>
<td>27 and above low risk</td>
<td>40 and above low risk</td>
</tr>
<tr>
<td>PSF</td>
<td>Not Administered</td>
<td>0-6 at risk</td>
<td>0-9 deficit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7-17 some risk</td>
<td>10-34 emerging</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18 and above low risk</td>
<td>35 and above established</td>
</tr>
<tr>
<td>NWF</td>
<td>Not Administered</td>
<td>0-4 at risk</td>
<td>0-14 at risk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5-12 some risk</td>
<td>15-24 some risk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13 and above low risk</td>
<td>25 and above low risk</td>
</tr>
</tbody>
</table>

*Note. ISF = Initial Sound Fluency; LNF = Letter Naming Fluency; PSF = Phoneme Segmentation Fluency; NWF = Nonsense Word Fluency. Adapted from DIBELS benchmark goals: Three assessment periods per year by the University of Oregon Center on Teaching and Learning (2008a). Retrieved from http://dibels.uoregon.edu.*

**Reliability and validity.** The evidence of reliability and validity with the DIBELS assessment has been researched extensively (Good et al., 2001; Simmons et al., 2000). Alternate form reliability ranges from .63 to .93 (Good et al., 2001). The concurrent criterion-related validity with other standardized measures of early reading skills ranges from .36 to .81 (Metropolitan Readiness Test, Stanford Diagnostic Reading Test, and Woodcock Johnson Psycho-Educational Battery) (Good et al., 2001). The Phoneme Segmentation Fluency subtest reliability ranges from .88 to .96. The Nonsense Word Fluency subtest reliability ranges from .92 to .98. The Letter Naming Fluency
The subtest reliability ranges from .93 to .98. The Initial Sound Fluency subtest reliability ranges from .65 to .90. These ranges were calculated using single probe and multi-probe reliability. Validity depends on the subtest given as well. Predictive validity on PSF ranges from .62 to .68; NWF ranges from .66 to .82; LNF ranges from .65 to .81; and ISF ranges from .36 to .45.

**Procedures**

I obtained approval from IRB at Liberty University and approval from the school system selected to participate in the research. After the approval was received, the class lists and DIBELS scores of those who were enrolled and attended pre-k within the selected school system during the 2007-08 and 2008-09 school years were requested. This information was requested from the pre-k director and the testing coordinator in the selected school system during an initial conference to explain the research design. The information requested included the following: class listing with a research code assigned by the school system for each child who attended pre-k in the four elementary schools in the 2007-08 and 2008-09 school years grouped by pre-k class, race of each child, gender of each child, free/reduced lunch status of each child, elementary school attended for kindergarten, and DIBELS scores for each subtest during kindergarten. The data were entered into a table as a Microsoft Excel file and displayed in chart form. The Excel table was opened as a file in *PASW Statistics GradPack 18*, more commonly referred to as SPSS version 18. Coding for nominal and ordinal data was completed, and SPSS was used to calculate the statistical results.
Research Design

The study employed a causal comparative design to examine differences in reading readiness of kindergarteners for students who attended public school pre-k. The study examined reading readiness data on children who participated in federally funded and state supported pre-k programs in a school system in the southeast. The causal comparative method was chosen since children cannot be randomly assigned to attend pre-k programs and archived data was used (Meyers, Gamst, & Guarino, 2006). Therefore, a convenience sample was used. The study examined the effects of public school, publicly funded pre-kindergarten programs, and contributes to the body of knowledge that supports lasting effects on reading readiness of children in kindergarten who attended public school pre-kindergarten. The current research was among the first performed on state supported pre-k within Alabama since the program was relatively new in the state (Alabama Department of Children’s Affairs, 2009).

Research Question 1: Is there a statistically significant difference in the linear combination of ISF and LNF scores (i.e. phonemic awareness and letter knowledge) at the beginning of the year of kindergarten of children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, and socioeconomic status?

Research Question 2: Is there a statistically significant difference in the linear combination of ISF, LNF, PSF, and NWF scores (i.e. phonemic awareness, letter knowledge, and phonics) at the middle of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended
high quality, federally supported pre-k in public schools, while controlling for race, gender, socioeconomic status, and beginning of the year ISF and LNF scores?

**Research Question 3:** Is there a statistically significant difference in the linear combination of LNF, PSF, and NWF scores (i.e. phonemic awareness, letter knowledge, and phonics) at the end of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, socioeconomic status and beginning of the year ISF and LNF scores?

**Data Analysis**

The DIBELS subtests yield a scale score and measure the reading readiness components of phonemic awareness, letter knowledge, and phonics (Good & Kaminski, 2002), and is not an exhaustive measure of all critical and relevant early literacy skills (Good et al., 2001). The DIBELS subtest scale scores for each child were obtained from the LEA for the beginning, middle, and end of kindergarten. Each child then had a total of nine subtest scores across kindergarten administrations. Between-subjects Multivariate Analysis of Covariance (MANCOVA) was used to analyze the scale scores for each subtest at the beginning, middle, and end of the year because MANCOVA examined multiple IVs and multiple DVs and helps to statistically control for possible effects and to equate groups on one or more confounding variables (Boslaugh & Watters, 2008; Tabachnick & Fidell, 2007). In this case, the confounding variables were race, gender, and socioeconomic status. According to Tabachnick and Fidell (2007) these confounding variables were reliable. Between-subjects MANCOVA was selected because I was assessing the effects on one independent variable with two levels and one
dependent variable with three levels (Meyers et al., 2006). The scores of the groups were independent of each other.

The covariates of beginning of the year ISF and LNF subtest scores were also used for the middle of the year and end of the year analysis since these beginning of the year measures helped to further equate the groups. The nature of causal comparative research lends itself to need a statistical matching procedure and analysis to improve the credibility and increase internal validity since matching and creating homogeneous groups was not an option in this particular research. MANCOVA allowed for statistical matching of groups when randomization was not possible (Tabachnick & Fidell, 2007). This helped control for the effects of race, gender, socioeconomic status, and beginning of the year ISF and LNF scores on the areas of letter knowledge, phonemic awareness, and phonics.

The first step was to screen the data in SPSS for missing values. SPSS was used to delete cases with missing data on the dependent variable. The data were then analyzed for possible outliers. Since the data were correctly entered but were more extreme for seven cases on the high end than a normal distribution, the value on the variable was altered (Tabachnick & Fidell, 2007). Normality, linearity, and homogeneity of variance-covariance tests of assumption were conducted prior to the MANCOVA being performed. The $p$ value was calculated for each administration of each subtest across kindergarten in order to determine if there was a significant difference between the two groups of students: those who attended state funded, public school pre-k and those who attended federally funded, public school pre-k. The results were displayed in table form and included the data from each administration of the subtests as well as the results of the
effects of the covariates. The $p$ value was compared to the null hypotheses to determine whether or not the null hypotheses were rejected. According to Meyers et al. (2006), post hoc tests were not needed since there were only two levels of the independent variable pre-k. The results are presented in Chapter Four. Chapter Five summarizes the findings and presents the implications, limitations, and recommendations for future research.
CHAPTER FOUR: RESULTS

Introduction

In this chapter the findings of the causal comparative research, which examined the differences in reading readiness among kindergarten students who attended state or federally funded public school pre-k in Alabama are presented. A convenience sample was used. The size of the sample was reduced from $N = 144$ to $N = 131$ after cases with missing values were deleted. Kindergarten DIBELS data from children who attended these pre-k classes in 2007-08 and 2008-09 were analyzed. The DIBELS measures included Initial Sound Fluency (ISF), Letter Naming Fluency (LNF), Phoneme Segmentation Fluency (PSF), and Nonsense Word Fluency (NWF).

Three between-subjects Multivariate Analysis of Covariance (MANCOVA) were conducted to examine the two-group independent variable of pre-k, state, and federally funded programs, for three administrations of the DIBELS. For each of the three analyses, the dependent variable employed was reading readiness, which consisted of the DIBELS probes. These probes were administered at the beginning (ISF, LNF), middle (ISF, LNF, PSF, NWF), and end of the year (LNF, PSF, NWF). Between-subjects MANCOVA was chosen because I was interested in examining the effects of one independent variable with two levels on one dependent variable with three levels (Meyers et al., 2006). Covariates for each analysis included race, gender, and socioeconomic status. The beginning of the year ISF and LNF were also used as covariates for the mid-year and end of the year analyses. The data were analyzed using SPSS. The effect size
partial eta-squared was used to determine the magnitude of statistically significant differences. The descriptive and inferential statistics are presented in this chapter.

**The Research Questions**

To achieve the purposes of the study, three research questions and 12 null hypotheses were posed:

RQ01: Is there a statistically significant difference in the linear combination of ISF and LNF scores (i.e. phonemic awareness and letter knowledge) at the beginning of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, and socioeconomic status?

H01: There will be no statistically significant difference in the linear combination of ISF and LNF scores (i.e. phonemic awareness and letter knowledge) at the beginning of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, and socioeconomic status.

H02: There will be no statistically significant difference in the ISF scores (i.e. phonemic awareness) at the beginning of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, and socioeconomic status.
H₀₃: There will be no statistically significant difference in the LNF scores (i.e. letter knowledge) at the beginning of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, and socioeconomic status.

RQ₀₂: Is there a statistically significant difference in the linear combination of ISF, LNF, PSF, and NWF scores (i.e. phonemic awareness, letter knowledge, and phonics) at the middle of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, socioeconomic status, and beginning of the year ISF and LNF scores?

H₀₄: There will be no statistically significant difference in the linear combination of ISF, LNF, PSF, and NWF scores (i.e. phonemic awareness, letter knowledge, and phonics) at the middle of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, socioeconomic status, and beginning of the year ISF and LNF scores.

H₀₅: There will be no statistically significant difference in the ISF scores (i.e. phonemic awareness) at the middle of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools,
while controlling for race, gender, socioeconomic status, and beginning of the year ISF and LNF scores.

H06: There will be no statistically significant difference in the LNF scores (i.e. letter knowledge) at the middle of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, socioeconomic status, and beginning of the year ISF and LNF scores.

H07: There will be no statistically significant difference in the PSF scores (i.e. phonemic awareness) at the middle of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, socioeconomic status, and beginning of the year ISF and LNF scores.

H08: There will be no statistically significant difference in the NWF scores (i.e. phonics) at the middle of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, socioeconomic status, and beginning of the year ISF and LNF scores.

RQ03: Is there a statistically significant difference in the linear combination of LNF, PSF, and NWF scores (i.e. phonemic awareness, letter knowledge and phonics) at the end of the kindergarten year for children who attended high quality, state
supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, socioeconomic status, and beginning of the year ISF and LNF scores?

H$_{09}$: There will be no statistically significant difference in the linear combination of LNF, PSF, and NWF scores (i.e. phonemic awareness, letter knowledge, and phonics) at the end of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, socioeconomic status, and beginning of the year ISF and LNF scores.

H$_{10}$: There will be no statistically significant difference in the LNF scores (i.e. letter knowledge) at the end of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, socioeconomic status, and beginning of the year ISF and LNF scores.

H$_{11}$: There will be no statistically significant difference in the PSF scores (i.e. phonemic awareness) at the end of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, socioeconomic status, and beginning of the year ISF and LNF scores.
H₁₂: There will be no statistically significant difference in the NWF scores (i.e. phonics) at the middle of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, socioeconomic status, and beginning of the year ISF and LNF scores.

Each null hypothesis was examined using the MANCOVA. To begin the analysis, DIBELS data were imported into SPSS for three administrations of the assessments: (a) beginning of the year, (b) middle of the year, and (c) end of the year. The null hypotheses for the study addressed whether or not significant differences in reading readiness on the kindergarten DIBELS would be found for those students who attended high quality state supported pre-k in public schools as opposed to those students who attended high quality federally supported pre-k in public schools. The .05 alpha level was used with the analysis of the DIBELS scores for each of the three administrations.

In order to investigate these null hypotheses a convenience sample was selected from a school system in east central Alabama and was included in the study. The participants identified for the study consisted of children who were enrolled and attended pre-k in 2007-08 and 2008-09 in each of the four elementary schools located within a single school system in east central Alabama. At the time of the study, the students were attending one of six similar elementary schools within the same school system. Eligible pre-k study participants were four years old on or before September 1, 2007 or 2008. All children who attended pre-k in this system lived in the attendance zone to enroll in
kindergarten within the system; however, it was not necessarily the school where they attended pre-k.

Eighteen children were enrolled in each pre-k class. Therefore, there were 72 children from the 2007-08 class and 72 children from the 2008-09 class. There were a total of 144 participants. Seventy-two children attended state supported, public school pre-k and 72 children attended federally funded, public school pre-k. The final sample contained 131 children who met the inclusion criteria. The sample group was divided into those children who attended pre-k in a state funded classroom \((n = 65)\) and those who attended a federally funded classroom \((n = 66)\). There was diversity among the children in the areas of race, ethnicity and socio-economic status. The group consisted of 29.77\% African American students and 64.89\% Caucasian students. A total of 5.34\% were from a race other than the two listed above. The socio-economic status of the students was also diverse. A total of 49.62\% came from high socioeconomic status (paid for lunch) and 50.38\% from low socioeconomic status (received free or reduced cost lunch). Females made up 48.85\% of the sample, and males accounted for 51.15\%. Race, gender, and socioeconomic status were identified as possible confounding variables and were controlled through the use of MANCOVA. The frequency of each variable is presented in Table 3.

This group of 131 students’ DIBELS scores was examined after their kindergarten year. These data are routinely collected and reported by the selected school system. The groups were used to address the three research questions and the twelve null hypotheses presented in Chapter One.
Table 3

Frequency of Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-k</td>
<td></td>
<td></td>
</tr>
<tr>
<td>State</td>
<td>65</td>
<td>49.62%</td>
</tr>
<tr>
<td>Federal</td>
<td>66</td>
<td>50.38%</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>Total</td>
<td>39</td>
</tr>
<tr>
<td>State</td>
<td>18</td>
<td>27.69%</td>
</tr>
<tr>
<td>Federal</td>
<td>21</td>
<td>31.82%</td>
</tr>
<tr>
<td>Caucasian</td>
<td>Total</td>
<td>85</td>
</tr>
<tr>
<td>State</td>
<td>45</td>
<td>69.23%</td>
</tr>
<tr>
<td>Federal</td>
<td>40</td>
<td>60.60%</td>
</tr>
<tr>
<td>Other</td>
<td>Total</td>
<td>7</td>
</tr>
<tr>
<td>State</td>
<td>2</td>
<td>3.08%</td>
</tr>
<tr>
<td>Federal</td>
<td>5</td>
<td>7.58%</td>
</tr>
<tr>
<td>Gender</td>
<td>Total</td>
<td>64</td>
</tr>
<tr>
<td>Female</td>
<td>State</td>
<td>30</td>
</tr>
<tr>
<td>Federal</td>
<td>34</td>
<td>51.52%</td>
</tr>
<tr>
<td>Male</td>
<td>Total</td>
<td>67</td>
</tr>
<tr>
<td>State</td>
<td>35</td>
<td>53.85%</td>
</tr>
<tr>
<td>Federal</td>
<td>32</td>
<td>48.48%</td>
</tr>
<tr>
<td>SES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paid</td>
<td>Total</td>
<td>65</td>
</tr>
<tr>
<td>State</td>
<td>34</td>
<td>52.31%</td>
</tr>
<tr>
<td>Federal</td>
<td>31</td>
<td>46.97%</td>
</tr>
<tr>
<td>Reduced</td>
<td>Total</td>
<td>11</td>
</tr>
<tr>
<td>State</td>
<td>5</td>
<td>7.69%</td>
</tr>
<tr>
<td>Federal</td>
<td>6</td>
<td>9.09%</td>
</tr>
<tr>
<td>Free</td>
<td>Total</td>
<td>55</td>
</tr>
<tr>
<td>State</td>
<td>26</td>
<td>40.00%</td>
</tr>
<tr>
<td>Federal</td>
<td>29</td>
<td>43.94%</td>
</tr>
</tbody>
</table>

Descriptive statistics. According to Hair, Anderson, Tatham, and Black (1998), the unique aspect of MANCOVA is that the analysis “optimally combines multiple dependent variables into one dependent variate and maximizes the differences across groups” (p. 334). Meyers et al. (2006) provided guidelines for determining when the use
of MANCOVA is appropriate and recommended that MANCOVA should not be used when the dependent variables are uncorrelated or are too highly correlated. Meyers et al. (2006) recommended using Weinfurt’s (1995) criteria, suggesting that if dependent variables exhibit correlations that fall below .21 they should not be merged into one variate. According to Kline (2005), correlations greater than .85 would indicate that the variables were too highly related and subsequently not recommended to be merged into one variate. This approach was applied to the DIBELS measures for the three administrations during the kindergarten year.

Pearson correlations for the DIBELS probes were examined to determine if the beginning, middle, and end of the year probes for phonemic awareness, letter knowledge, and phonics could be combined to form respective reading readiness variates. The beginning of the year DIBELS ISF/LNF probes (i.e. phonemic awareness and letter knowledge) were correlated at \( r = .587 \). Correlations for the middle of the year DIBELS probes, ISF, LNF, PSF, NWF (i.e. phonemic awareness, letter knowledge, and phonics) ranged from \( r = .225 \) to \( r = .643 \). Correlations for the end of the year DIBELS probes LNF, PSF, NWF (i.e. phonemic awareness, letter knowledge, and phonics) ranged from \( r = .230 \) to \( r = .653 \). All correlations were statistically significant at the .01 alpha level and fell within Kline’s (2005) and Weinfurt’s (1995) criteria of .21 and .85 for each of the dependent variables that would be combined into the beginning of the year, middle of the year, and end of the year reading readiness dependent variates, respectively. Table 4 provides correlations for the DIBELS beginning, middle, and end of the year probes.
Table 4

*Correlation Matrix for DIBELS Probes*

<table>
<thead>
<tr>
<th>DIBELS Probes</th>
<th>ISF Beg Yr</th>
<th>ISF Mid Yr</th>
<th>LNF Mid Yr</th>
<th>PSF Mid Yr</th>
<th>NWF Mid Yr</th>
<th>LNF End Yr</th>
<th>PSF End Yr</th>
<th>NWF End Yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNF Beg Yr</td>
<td>.587*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ISF Mid Yr</td>
<td>1.00*</td>
<td>.286*</td>
<td>.390*</td>
<td>.226*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LNF Mid Yr</td>
<td>1.00*</td>
<td>1.00*</td>
<td>.500*</td>
<td>.651*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSF Mid Yr</td>
<td>1.00*</td>
<td>.505*</td>
<td>1.00*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NWF Mid Yr</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.00*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LNF End Yr</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.00*</td>
<td>.245*</td>
<td>.653*</td>
<td></td>
</tr>
<tr>
<td>PSF End Yr</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.00*</td>
<td></td>
<td>1.00*</td>
<td>.230*</td>
</tr>
<tr>
<td>NWF End Yr</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* A * indicates a statistically significant difference at the .01 level. ISF Beg Yr = Initial Sound Fluency for the beginning of the year measures phonemic awareness; ISF Mid Yr = Initial Sound Fluency for the middle of the year measures phonemic awareness; LNF Beg Yr = Letter Naming Fluency for the beginning of the year measures letter knowledge; LNF Mid Yr = Letter Naming Fluency for the middle of the year measures letter knowledge; LNF End Yr = Letter Naming Fluency for the end of the year measures letter knowledge; PSF Mid Yr = Phoneme Segmentation Fluency for the middle of the year phonemic awareness; PSF End Yr = Phoneme Segmentation Fluency for the end of the year phonemic awareness; NWF Mid Yr = Nonsense Word Fluency for the middle of the year measures phonics; NWF End Yr = Nonsense Word Fluency for the end of the year measures phonics.
**Analysis.** A series of three between-subjects MANCOVAs were conducted to examine the two-group independent variable of pre-k, state, and federally funded programs. For each of the three analyses, the dependent variate used was reading readiness, which was a combination of the DIBELS probes administered at the beginning (ISF, LNF), middle (ISF, LNF, PSF, NWF), and end of the year (LNF, PSF, NWF) respectively. The covariates included race, gender, and socioeconomic status for the beginning of the year analysis. The following MANCOVAs for the middle and end of the year dependent variates of reading readiness included race, gender, socioeconomic status, and the DIBELS pretests (ISF and LNF) administered at the beginning of the year.

The following were examined prior to statistical analysis: normality, homogeneity of variance-covariance, and linearity:

**Multivariate normality:** Mahalanobis distance was calculated. The critical value was 27.88. There were seven instances of multivariate outliers. After examination of the individual cases determined as outliers, it was decided to retain the data with alteration (Tabachnick & Fidell, 2007).

**Linearity:** examination of the scatter plots between all dependent variables and covariates indicated that each variable was reasonably normally distributed and linearly related. Scatter plots can be found in Appendix A. Since there was reasonable linearity, the analysis proceeded.

**Reliability of the covariates:** examination of the correlation matrix indicated that the covariates were measured without error and, therefore; reliable for analysis (Meyers et al., 2006). The means and standard deviations for the DIBELS probes are provided in Table 5.
Table 5

Means (M), Adjusted M, and Standard Deviations (SDs) for Dynamic Indicators of Basic Early Literacy Skills 6th ed. (DIBELS) Probes for Students

<table>
<thead>
<tr>
<th>DIBELS Probes</th>
<th>State Funded n=65</th>
<th>Federally Funded n=66</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>Adjusted M</td>
</tr>
<tr>
<td><strong>Beginning of the year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial Sound Fluency</td>
<td>11.98</td>
<td>11.82</td>
</tr>
<tr>
<td><strong>Middle of the year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial Sound Fluency</td>
<td>44.23</td>
<td>42.84</td>
</tr>
<tr>
<td>Letter Naming Fluency</td>
<td>50.77</td>
<td>49.96</td>
</tr>
<tr>
<td>Phoneme Segmentation Fluency</td>
<td>41.32</td>
<td>40.73</td>
</tr>
<tr>
<td>Nonsense Word Fluency</td>
<td>32.8</td>
<td>23.12</td>
</tr>
<tr>
<td><strong>End of the year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Letter Naming Fluency</td>
<td>60.4</td>
<td>59.64</td>
</tr>
<tr>
<td>Phoneme Segmentation Fluency</td>
<td>58.08</td>
<td>57.74</td>
</tr>
<tr>
<td>Nonsense Word Fluency</td>
<td>54.32</td>
<td>52.82</td>
</tr>
</tbody>
</table>

For each MANCOVA, Wilks’ Lambda test was reported. Tabachnick and Fidell (2007) noted that when the independent variable has only two levels, all the multivariate statistics (Wilks’ Lambda, Pillai’s Trace, Hotelling’s Trace, and Roy’s Largest Root) will produce the same result ($F$ value). The beginning of the year DIBELS probes were examined for the pre-K federal and state funded groups. A between-subjects MANCOVA was conducted to examine the independent variable of pre-k federal and state groups compared to the reading readiness dependent variate (e.g. ISF and LNF). The covariates were gender, race, and socioeconomic status. Table 6 provides means, adjusted means, and standard deviations for the DIBELS probes for students.
To test the first null hypothesis, a between-subjects MANCOVA for the beginning of the year reading readiness composite variable was used. The analysis of Box’s Test of Equality of Covariance Matrices was not statistically significant (Box’s $M = 4.560, p = .214$), indicating that the dependent variable covariance matrices were equal across levels of the independent variable. Levene’s test for equality of variances were not significant, ISF ($F = .150, p = .699$) and LSF ($F = .056, p = .813$). Wilks’ Lambda results are provided in Table 7. Following controlling for the covariates of race, gender and socioeconomic status, no overall effect was observed for the independent variable pre-k, state or federally funded programs and the dependent variate, reading readiness, which consisted of ISF and LNF DIBELS probes administered at the beginning of the year ($p = .620$, partial $\eta^2 = .008$). The descriptive statistics for each subtest can be found in Table 6. However, it is important to note that the power for the pretests (ISF and LNF) was low (.127), indicating that a significant difference may exist. However, the sample size was not large enough to reveal or dispute this possible difference. For the covariates of gender ($p = .019$, partial $\eta^2 = .061$) and SES ($p = .008$, partial $\eta^2 = .075$) significant overall effects were revealed between the covariates and the dependent composite variable. Power was moderate for gender (.715) and SES (.808).
No significant effect was found for the covariate race ($p = .558$, partial $\eta^2 = .009$) and the dependent composite variable.

Table 7

**MANCOVA Results for Pre-K type and the Covariates Race, Gender, and SES for the Reading Readiness Variate for the Beginning of the Year DIBELS Probes**

<table>
<thead>
<tr>
<th>Effect</th>
<th>Wilks’ Lambda Test</th>
<th>$F$</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-K State/Fed Covariates</td>
<td>.992</td>
<td>.480</td>
<td>.620</td>
<td>.008</td>
<td>.127</td>
</tr>
<tr>
<td>Race</td>
<td>.991</td>
<td>.586</td>
<td>.558</td>
<td>.009</td>
<td>.146</td>
</tr>
<tr>
<td>Gender</td>
<td>.939</td>
<td>4.073</td>
<td>.019*</td>
<td>.061</td>
<td>.715</td>
</tr>
<tr>
<td>SES</td>
<td>.925</td>
<td>5.033</td>
<td>.008*</td>
<td>.075</td>
<td>.808</td>
</tr>
</tbody>
</table>

*Note.* * indicates statistically significant difference at .05 alpha level

In order to test the second and third null hypotheses, univariate tests were conducted for ISF and LNF. Results are provided in Table 8. The descriptive statistics for each subtest can be found in Table 6. Levene’s Test of Equality of Error Variances was not significant for the dependent variables: ISF ($F = .150$, $p = .699$) or LNF ($F = .056$, $p = .813$) and indicated the dependent variables exhibited equal error variances. No significant differences were found for either subtest: ISF ($p = .935$, partial $\eta^2 = .001$) and LNF ($p = .398$, partial $\eta^2 = .006$).
Table 8

Univariate Between-Subjects for Beginning of the Year DIBELS Probes

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISF</td>
<td>1</td>
<td>0.725</td>
<td>0.007</td>
<td>0.935</td>
<td>0.001</td>
<td>0.051</td>
</tr>
<tr>
<td>LNF</td>
<td>1</td>
<td>133.681</td>
<td>0.718</td>
<td>0.398</td>
<td>0.006</td>
<td>0.134</td>
</tr>
</tbody>
</table>

To test the fourth null hypothesis, the middle of the year DIBELS probes were examined for the pre-K federal and state funded groups. A between-subjects MANCOVA was conducted to examine the independent variable of pre-K federal and state groups compared to the reading readiness dependent variate (ISF, LNF, PSF, and NWF). The covariates were beginning of the year pretests, gender, race, and socioeconomic status. See Table 9 means, adjusted means, and standard deviations for the DIBELS probes for students.

The MANCOVA for the middle of the year reading readiness analysis Box’s Test of Equality of Covariance Matrices was statistically significant (Box’s M = 20.860, p = .02) indicating that the dependent variable covariance matrices were unequal across levels of independent variables. Levene’s test for equality of variances was significant for ISF1 (F = 4.434, p = .037). Levene’s was not significant for the following: LNF (F = .064, p = .800), PSF (F = 1.834, p = .178), and NWF (F = 1.277, p = .261). Meyers et al. (2006) noted that “violation of this homogeneity of covariance matrices assumption when sample sizes are fairly equal produces minor consequences” (p. 378). Hair et al. (1998) asserted that the Box Test is extremely conservative and that a “significance level of .01 or less” should be used as an “adjustment for the sensitivity of the statistic” (p. 328). This criterion was applied.
Table 9

Means (M), Adjusted M, and Standard Deviations (SDs) for Dynamic Indicators of Basic Early Literacy Skills 6th ed. (DIBELS) Middle of the Year Probes for Students

<table>
<thead>
<tr>
<th>DIBELS Probes</th>
<th>State Funded</th>
<th>Federally Funded</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n=65</td>
<td>n=66</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>Adjusted M</td>
</tr>
<tr>
<td>Middle of the year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial Sound Fluency</td>
<td>44.23</td>
<td>42.84</td>
</tr>
<tr>
<td>Letter Naming Fluency</td>
<td>50.77</td>
<td>49.96</td>
</tr>
<tr>
<td>Phoneme Segmentation Fluency</td>
<td>41.32</td>
<td>40.73</td>
</tr>
<tr>
<td>Nonsense Word Fluency</td>
<td>32.8</td>
<td>23.12</td>
</tr>
</tbody>
</table>

After controlling for the following covariates: beginning of the year ISF and LNF, race, gender, and socioeconomic status, Wilks’ Lambda revealed a significant overall effect for the independent variable, pre-K state or federally funded programs and the dependent variate, reading readiness which consisted of ISF, LNF, PSF, NWF DIBELS probes administered in the middle of the year \( p = .001, \) partial \( \eta^2 = .167 \). The descriptive statistics for each subtest can be found in Table 9. For the covariates of race \( p = .569, \) partial \( \eta^2 = .024 \) and SES \( p = .134, \) partial \( \eta^2 = .056 \) no significant overall effects were found. However, there was a statistically significant effect for the covariate gender \( p = .037, \) partial \( \eta^2 = .080 \), pretest ISF \( p = .013, \) partial \( \eta^2 = .098 \), and pretest LNF \( p = .001, \) partial \( \eta^2 = .298 \). Results are provided in Table 10.
Table 10

MANCOVA Results for Pre-K type and the Covariates Race, Gender, SES, and DIBELS Pretests for the Reading Readiness Variate for the Middle of the Year DIBELS Probes.

<table>
<thead>
<tr>
<th>Effect</th>
<th>Wilks’ Lambda Test</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-K State/Fed Covariates</td>
<td>.833</td>
<td>6.081</td>
<td>.001*</td>
<td>.167</td>
<td>.984</td>
</tr>
<tr>
<td>Race</td>
<td>.976</td>
<td>.736</td>
<td>.569</td>
<td>.024</td>
<td>.232</td>
</tr>
<tr>
<td>Gender</td>
<td>.920</td>
<td>2.647</td>
<td>.037*</td>
<td>.080</td>
<td>.725</td>
</tr>
<tr>
<td>SES</td>
<td>.944</td>
<td>1.798</td>
<td>.134</td>
<td>.056</td>
<td>.534</td>
</tr>
<tr>
<td>Pretests ISF</td>
<td>.902</td>
<td>3.294</td>
<td>.013*</td>
<td>.098</td>
<td>.826</td>
</tr>
<tr>
<td>Pretests LNF</td>
<td>.702</td>
<td>12.811</td>
<td>.001*</td>
<td>.298</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*Note. * indicates statistically significant difference at .05 alpha level.

A series of univariate between-subjects analyses were conducted to determine the source of the statistically significant difference for pre-k, state and federal groups, and the middle of the year DIBELS probes (ISF, LNF, PSF, and NWF). Levene’s Test of Equality of Error Variances was not significant for the majority of the dependent variables: LNF \( (p = .800) \), PSF \( (p = .178) \), or NWF \( (p = .261) \), which indicated that the dependent variables exhibited equal error variances. Levene’s Test of Equality of Error Variances was significant for the dependent variable ISF \( (p = .037) \). As a result, the skew and kurtosis values for the dependent variables were examined. All values for the dependent variables fell within Curran, West, and Finch’s (1996) criteria of skew values not exceeding 2.0 and of kurtosis values not exceeding 7.0.

In order to determine the source of the statistically significant difference for pre-k, state and federal groups, and the middle of the year DIBELS probes (ISF, LNF, PSF,
NWF) each DIBELS probe was examined. The descriptive statistics for each probe can be found in Table 9. A Bonferroni correction was applied which adjusted the alpha level to \( p = .012 \) in order to account for the use of multiple univariate tests and apply a more stringent alpha level. For ISF administered in the middle of the year a significant difference was found for pre-k state/federal \( (p = .001, \text{partial } \eta^2 = .097) \). The federally funded program yielded higher scores \( (M = 58.12, SD = 29.74) \) and was statistically significant when compared to the state funded program \( (M = 44.23, SD = 27.22) \). For PSF a significant difference was revealed \( (p = .005, \text{partial } \eta^2 = .063) \) in favor of the federally funded pre-k program \( (M = 47.62, SD = 17.41) \) when compared to the state funded program \( (M = 41.32, SD = 15.48) \). For LNF \( (p = .536, \text{partial } \eta^2 = .003) \) and NWF \( (p = .059, \text{partial } \eta^2 = .028) \) administered in the middle of the year no significant differences were found when pre-k state and federally funded programs were compared.

Next, univariate between-subjects analyses were conducted for the covariates that yielded statistically significant differences. A significant difference was found for the covariate, gender for the ISF DIBELS probe administered in the middle of the year \( (p = .010; \text{partial } \eta^2 = .053) \). For the pretest ISF and LNF \( (p = .014; \text{partial } \eta^2 = .048) \), a statistically significant difference was found at the .05 alpha level; however, when the adjusted alpha level of \( (p = .012) \) was applied, a nonsignificant difference was revealed. For the pretest ISF, a significant difference was found for the middle of the year DIBELS probe NWF \( (p = .001; \text{partial } \eta^2 = .089) \). For the pretest LNF, a significant difference was revealed for all of the DIBELS middle of the year probes: ISF \( (p = .001; \text{partial } \eta^2 = .129) \); LNF \( (p = .001; \text{partial } \eta^2 = .235) \); PSF \( (p = .001; \text{partial } \eta^2 = .104) \); and NWF
\( p = .002; \text{ partial } \eta^2 = .075 \). Results are provided in Table 11. These univariate between-subjects tests provided the data for analysis of hypotheses five through eight.
Table 11

Univariate Between-Subjects for Pre-K Type, Gender, and the Pretests for the Middle of the Year DIBELS Probes.

<table>
<thead>
<tr>
<th>Source</th>
<th>Dependent Variable</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-K State/Federal</td>
<td>ISF</td>
<td>1</td>
<td>8942.073</td>
<td>13.364</td>
<td>.001**</td>
<td>.097</td>
<td>.952</td>
</tr>
<tr>
<td></td>
<td>LNF</td>
<td>1</td>
<td>80.620</td>
<td>.385</td>
<td>.536</td>
<td>.003</td>
<td>.094</td>
</tr>
<tr>
<td></td>
<td>PSF</td>
<td>1</td>
<td>1805.991</td>
<td>8.268</td>
<td>.005**</td>
<td>.063</td>
<td>.814</td>
</tr>
<tr>
<td></td>
<td>NWF</td>
<td>1</td>
<td>1139.407</td>
<td>3.622</td>
<td>.059</td>
<td>.028</td>
<td>.471</td>
</tr>
<tr>
<td>Covariates Gender</td>
<td>ISF</td>
<td>1</td>
<td>4627.721</td>
<td>6.916</td>
<td>.010**</td>
<td>.053</td>
<td>.742</td>
</tr>
<tr>
<td></td>
<td>LNF</td>
<td>1</td>
<td>4.576</td>
<td>.022</td>
<td>.883</td>
<td>.000</td>
<td>.052</td>
</tr>
<tr>
<td></td>
<td>PSF</td>
<td>1</td>
<td>24.191</td>
<td>.111</td>
<td>.740</td>
<td>.001</td>
<td>.063</td>
</tr>
<tr>
<td></td>
<td>NWF</td>
<td>1</td>
<td>836.449</td>
<td>2.659</td>
<td>.106</td>
<td>.021</td>
<td>.366</td>
</tr>
<tr>
<td>Pretest ISF</td>
<td>ISF</td>
<td>1</td>
<td>94.772</td>
<td>.142</td>
<td>.707</td>
<td>.001</td>
<td>.066</td>
</tr>
<tr>
<td></td>
<td>LNF</td>
<td>1</td>
<td>1303.843</td>
<td>6.220</td>
<td>.014**</td>
<td>.048</td>
<td>.697</td>
</tr>
<tr>
<td></td>
<td>PSF</td>
<td>1</td>
<td>199.988</td>
<td>.916</td>
<td>.341</td>
<td>.007</td>
<td>.158</td>
</tr>
<tr>
<td></td>
<td>NWF</td>
<td>1</td>
<td>3810.557</td>
<td>12.112</td>
<td>.001**</td>
<td>.089</td>
<td>.932</td>
</tr>
<tr>
<td>Pretest LNF</td>
<td>ISF</td>
<td>1</td>
<td>12270.403</td>
<td>18.339</td>
<td>.001**</td>
<td>.129</td>
<td>.989</td>
</tr>
<tr>
<td></td>
<td>LNF</td>
<td>1</td>
<td>7981.942</td>
<td>38.080</td>
<td>.001**</td>
<td>.235</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>PSF</td>
<td>1</td>
<td>3152.629</td>
<td>14.433</td>
<td>.001**</td>
<td>.104</td>
<td>.965</td>
</tr>
<tr>
<td></td>
<td>NWF</td>
<td>1</td>
<td>3177.381</td>
<td>10.099</td>
<td>.002**</td>
<td>.075</td>
<td>.884</td>
</tr>
</tbody>
</table>

Note. * indicates statistically significant difference at .05 alpha level. ** indicates statistically significant difference at .012 alpha level.
To test the ninth hypothesis, the end of the year DIBELS probes were examined for the pre-K federal and state funded groups. A between-subjects MANCOVA was conducted to examine the independent variable of pre-k federal and state groups compared to the reading readiness dependent variate (LNF, PSF, and NWF). The covariates were beginning of the year pretests, gender, race, and socioeconomic status. See Table 12 for means, adjusted means, and standard deviations for the DIBELS probes for students.

The MANCOVA for the end of the year reading readiness analysis Box’s Test of Equality of Covariance Matrices was not statistically significant (Box’s $M = 12.194$, $p = .065$) indicating that the dependent variables’ covariance matrices were equal across levels of independent variables. Levene’s test for equality of variances was not significant for the following: LNF ($F = .509, p = .477$), PSF ($F = 0.20, p = .888$), and NWF ($F = .896, p = .346$). Wilks’ Lambda revealed a non-significant overall effect for the independent variable, pre-K state or federally funded programs and the dependent variate, reading readiness which consisted of (LNF, PSF, NWF) DIBELS probes administered at the end of the year ($p = .078$, partial $\eta^2 = .054$).
Table 12

*Means (M), Adjusted M, and Standard Deviations (SDs) for Dynamic Indicators of Basic Early Literacy Skills 6th ed. (DIBELS) End of the Year Probes for Students*

<table>
<thead>
<tr>
<th>DIBELS Probes</th>
<th>State Funded</th>
<th>Federally Funded</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><em>n</em>=65</td>
<td><em>n</em>=66</td>
</tr>
<tr>
<td><strong>M</strong></td>
<td>Adjusted M</td>
<td>SD</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>End of the year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Letter Naming Fluency</td>
<td>60.4</td>
<td>59.64</td>
</tr>
<tr>
<td>Phoneme Segmentation</td>
<td>58.08</td>
<td>57.74</td>
</tr>
<tr>
<td>Nonsense Word Fluency</td>
<td>54.32</td>
<td>52.82</td>
</tr>
</tbody>
</table>

The descriptive statistics for each subtest can be found in Table 12. No significant overall effects were found for the following covariates: race (*p* = .620, partial $\eta^2 = .014$); gender (*p* = .291, partial $\eta^2 = .030$); and SES (*p* = .369, partial $\eta^2 = .025$). However, there was a statistically significant effect for the following covariates ISF pretest (*p* = .031, partial $\eta^2 = .070$) and pretest LNF (*p* = .001, partial $\eta^2 = .292$). Results are provided in Table 13.
Table 13

**MANCOVA Results for Pre-K type and the Covariates Race, Gender, SES, and DIBELS Pretests for the Reading Readiness Variate for the End of the Year DIBELS Probes.**

<table>
<thead>
<tr>
<th>Effect</th>
<th>Wilks’ Lambda Test</th>
<th>$F$</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-K State/Fed</td>
<td>.946</td>
<td>2.322</td>
<td>.078</td>
<td>.054</td>
<td>.572</td>
</tr>
<tr>
<td>Race</td>
<td>.986</td>
<td>.595</td>
<td>.620</td>
<td>.014</td>
<td>.171</td>
</tr>
<tr>
<td>Gender</td>
<td>.970</td>
<td>1.262</td>
<td>.291</td>
<td>.030</td>
<td>.331</td>
</tr>
<tr>
<td>SES</td>
<td>.975</td>
<td>1.059</td>
<td>.369</td>
<td>.025</td>
<td>.281</td>
</tr>
<tr>
<td>Pretests ISF</td>
<td>.930</td>
<td>3.068</td>
<td>.031*</td>
<td>.070</td>
<td>.707</td>
</tr>
<tr>
<td>Pretests LNF</td>
<td>.708</td>
<td>16.799</td>
<td>.001*</td>
<td>.292</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*Note.* * indicates statistically significant difference at .05 alpha level.

In order to test the 10th, 11th, and 12th null hypotheses, univariate tests were conducted for LNF, PSF, and NWF. Results are provided in Table 14. Levene’s Test of Equality of Error Variances was not significant for the dependent variables: LNF ($F = .509, p = .477$), PSF ($F = 0.20, p = .888$), or NWF ($F = .896, p = .346$) and indicated the dependent variables exhibited equal error variances. The descriptive statistics for each subtest can be found in Table 12. No significant differences were found for any subtest: LNF ($p = .373$, partial $\eta^2 = .006$), PSF ($p = .191$, partial $\eta^2 = .014$), and NWF ($p = .131$, partial $\eta^2 = .018$).
Null hypotheses. There were 12 null hypotheses posed for the three research questions. In determining whether or not the null hypotheses would be rejected, three between-subjects MANCOVAs were used. While some differences were found in the middle of the year, by the end of the year the groups showed no significant differences using the .05 alpha level:

H<sub>01</sub>: There will be no statistically significant difference in the linear combination of ISF and LNF scores (i.e. phonemic awareness and letter knowledge) at the beginning of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, and socioeconomic status.

H<sub>02</sub>: There will be no statistically significant difference in the ISF scores (i.e. phonemic awareness) at the beginning of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, and socioeconomic status.

H<sub>03</sub>: There will be no statistically significant difference in the LNF scores (i.e. letter knowledge) at the beginning of the kindergarten year for children who attended...
high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, and socioeconomic status.

H04: There will be no statistically significant difference in the linear combination of ISF, LNF, PSF, and NWF scores (i.e. phonemic awareness, letter knowledge, and phonics) at the middle of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, and socioeconomic status.

H05: There will be no statistically significant difference in the ISF scores (i.e. phonemic awareness) at the middle of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, and socioeconomic status.

H06: There will be no statistically significant difference in the LNF scores (i.e. letter knowledge) at the middle of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, and socioeconomic status.

H07: There will be no statistically significant difference in the PSF scores (i.e. phonemic awareness) at the middle of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to
children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, and socioeconomic status.

$H_{08}$: There will be no statistically significant difference in the NWF scores (i.e. phonics) at the middle of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, and socioeconomic status.

$H_{09}$: There will be no statistically significant difference in the linear combination of LNF, PSF, and NWF scores (i.e. phonemic awareness, letter knowledge, and phonics) at the end of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, and socioeconomic status.

$H_{10}$: There will be no statistically significant difference in the LNF scores (i.e. letter knowledge) at the end of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, and socioeconomic status.

$H_{11}$: There will be no statistically significant difference in the PSF scores (i.e. phonemic awareness) at the end of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, and socioeconomic status.
H_{12}. There will be no statistically significant difference in the NWF scores (i.e. phonics) at the middle of the kindergarten year for children who attended high quality, state supported pre-k in public schools as opposed to children who attended high quality, federally supported pre-k in public schools, while controlling for race, gender, and socioeconomic status.

The first null hypothesis stated there would be no significant difference in the linear combination of ISF and LNF at the beginning of the year. No significant difference was found ($p = .620$). The power (.127) and effect (.008) sizes were small. Since the power and effect sizes were small there could possibly exist a significant difference but the sample size was not large enough to reveal or dispute this possible difference. The first null hypothesis was rejected based on this possibility.

The second null hypothesis addressed phonemic awareness through the ISF subtest of the DIBELS at the beginning of the year. The results of the univariate test for ISF at the beginning of the year were not significant ($p = .935$). Power (.051) and effect (.001) sizes were small. Based on the possibility that a significant difference could exist based on low power and effect size, the second null hypothesis was rejected.

The third null hypothesis addressed letter knowledge through the LNF subtest of the DIBELS at the beginning of the year. The univariate tests for LNF at the beginning of the year were not significant ($p = .398$). Power (.051) and effect (.006) sizes were small. Due to the possibility that a significant difference could exist based on the low power and effect sizes, the null hypothesis was rejected.

The fourth null hypothesis stated there would be no significant difference in the linear combination of ISF, LNF, PSF, and NWF in the middle of the year. A significant
difference was found ($p = .001$). The power was more than adequate (.984), and the
effect size was large (.167). There was also a statistically significant effect for the
covariates gender ($p = .037$), pretest ISF ($p = .013$), and pretest LNF ($p = .001$). This null
hypothesis was rejected.

The fifth null hypothesis addressed phonemic awareness through the ISF subtest
of the DIBELS at the middle of the year. A significant difference was found ($p = .001$).
Power was more than adequate (.952), and the effect size was moderate (.097). The
federally funded program yielded significantly higher scores than the state funded
program. Significant differences were also found for the covariate gender and ISF
subtest ($p = .010$). Females yielded significantly higher scores than males. The null
hypothesis was rejected.

The sixth null hypothesis stated there would be no significant difference in the
LNF scores in the middle of the year. The univariate test for LNF was not significant
($p = .536$). Power (.094) and effect (.003) sizes were small. Based on the possibility of a
Type 2 error, the null hypothesis was rejected.

The seventh null hypothesis focused on no significant difference in the PSF scores
in the middle of the year. The univariate test for PSF was determined to be significant
($p = .005$). Power was sufficient (.814) and the effect size was moderate (.063). The
federally funded program yielded significantly higher scores than the state funded
program. Significant differences were also noted for the covariate pretest LNF and PSF
($p = .001$). The null hypothesis was rejected.

The eighth null hypothesis refers to no significant differences in the NWF scores
in the middle of the year. The univariate test for NWF was not significant ($p = .059$).
Power (.471) and effect (.028) were small. The null hypothesis was rejected due to the possibility of a significant difference based on the low power and effect size.

The ninth null hypothesis stated there would be no significant difference in the linear combination of LNF, PSF, and NWF at the end of the year. No significance was found ($p = .078$). Power (.572) and effect (.054) were small. Based on the possibility of a Type 2 error, the null hypothesis was rejected.

The tenth null hypothesis addressed LNF subtest of the DIBELS at the end of the year. No significant difference was found ($p = .373$). Power (.144) and effect (.006) were small. The null hypothesis was rejected based on the possibility that a significant difference could exist based on low power and effect size.

The eleventh null hypothesis focused on the PSF subtest of the DIBELS at the end of the year. No significant difference was found ($p = .191$). Power (.257) and effect (.014) sizes were small. The null hypothesis was rejected due to the possibility of a Type 2 error.

The last null hypothesis refers to no significant difference in the NWF subtest scores at the end of the year. No significant difference was found ($p = .131$). Power (.326) and effect (.018) were small. The null hypothesis was rejected due to the possibility of a Type 2 error.

**Summary**

Three research questions yielding 12 null hypotheses were evaluated for the study on reading readiness in pre-k in Alabama. A series of three between-subjects MANCOVAs was performed on beginning of the year, middle of the year, and end of the year DIBELS results in order to address the research questions and null hypotheses. All
12 hypotheses were rejected. All hypotheses but three were rejected based on the possibility of a Type 2 error due to low power and effect sizes. The ISF and PSF in the middle of the year were determined to be significant at a more stringent alpha level ($p = .012$). These three hypotheses were rejected based on statistical significance. In the final chapter the results will be presented in further detail. Implications, limitations, and recommendations for future research will also be provided.
CHAPTER FIVE: DISCUSSION

Summary of the Findings

Pre-k has been shown to be effective in the areas of language, academic skills, and social competencies (Burchinal et al., 2008; Mashburn & Pianta, 2006; Mashburn et al., 2008; Wong et al., 2008). However, few studies could be located that have evaluated pre-k based on the characteristics that make pre-k effective or the setting in which pre-k should take place. In Alabama, pre-k is found in settings such as public schools, Head Start centers, private day care, and faith based centers (Alabama Department of Children’s Affairs, 2009), and is funded by state, federal, and local entities (Barnett et al., 2010). There is limited research that examines the effectiveness of pre-k based on setting, funding, and the effects on reading readiness. In the study, state funded public school pre-k programs were compared against federally funded programs to determine which was more effective in teaching and improving the reading readiness skills of pre-k students.

The school system chosen for inclusion in the study had state and federally funded pre-k classes located within similar elementary schools. The data collected, which consisted of three administrations of the DIBELS, were data that are normally collected and reported by the school system. A total of 131 participants met the inclusion criteria from the 2007-08 and 2008-09 school years. This included children who attended state funded pre-k in the public school \( n = 65 \) and children who attended federally funded pre-k in the public school \( n = 66 \). A series of three between-subjects MANCOVAs (beginning of the year, middle of the year, and end of the year) were
performed to evaluate the DIBELS data in order to control for race, gender, and socioeconomic status. Beginning of the year ISF and LNF scores were also used as covariates for the middle of the year and end of year analysis.

Three research questions that generated 12 null hypotheses were used in the study. In order to test these hypotheses a convenience sample of children who attended pre-k in the 2007-08 and 2008-09 academic years was chosen from the selected school system. DIBELS data from the kindergarten year were collected from the school system since this is data that is normally collected and reported and since DIBELS is an indicator of reading readiness.

To address the overall main effect of state and federally funded pre-k on reading readiness (phonemic awareness, letter knowledge, and phonics), the results of the beginning of the year MANCOVA were analyzed to include the linear combination of ISF and LNF scores. No significant differences in the linear combination of beginning of the year ISF and LNF (reading readiness) were found for children who attended state funded pre-k in public schools as opposed to children who attended federally funded pre-k in public schools at the beginning of the kindergarten year. Low power and effect size introduced the possibility of failing to reject the null hypothesis when there was the possibility of differences. The null hypothesis was rejected.

After analysis of the univariate tests for the beginning of the year ISF and LNF subtests, no significant differences were found for children who attended state funded pre-k in public schools as opposed to children who attended federally funded pre-k in public schools. Again, low power and effect sizes were noted. These two null hypotheses were rejected since the possibility of differences existed.
The linear combination of middle of the year ISF, LNF, PSF, and NWF subtests was analyzed for significant differences of reading readiness. A significant difference was noted. Power and effect sizes were substantial. There was also a significant difference for the covariates gender, pretest ISF, and pretest LNF. Further examination using univariate tests revealed a significant difference for ISF (phonemic awareness) with federally funded programs performing at significantly higher levels than state funded programs. A significant difference was also noted for PSF (phonemic awareness) in favor of the federally funded program. After analyzing the covariates a statistically significant difference was found for ISF and gender with females outperforming males.

The covariate pretest ISF and NWF yielded a significant difference, and the covariate pretest LNF yielded significant differences for all of the middle of the year DIBELS probes. The null hypothesis for the linear combination was rejected since significant differences were noted and power and effect size were large. The null hypotheses for LNF and NWF were rejected due to low power and effect size and the possibility of a Type 2 error. The null hypotheses for ISF and PSF were rejected due to the significant differences noted as well as substantial power and effect size.

It is difficult to account for the differences between state and federally funded programs. There is the possibility that federally funded programs were focused more on phonemic awareness since both the ISF and PSF subtests measure phonemic awareness. These programs possibly utilized more time to manipulate, substitute, and recombine sounds through songs, stories, rhymes, and direct instruction as suggested by Lundberg (2009). Another assumption could be made in light of the work of Molfese et al. (2006). Molfese supported the idea that children who develop alphabet knowledge skills perform
at higher levels on kindergarten phonological awareness assessments. Also, Good et al. (2001) and Fien et al. (2009) supported the idea that fluency in letter naming is a strong predictor of other reading skills. The federally funded classes may have placed more emphasis on alphabet knowledge or letter naming, which affects the phonemic awareness subtests ISF and PSF in kindergarten.

Analysis of the linear combination of end of the year LNF, PSF, and NWF (reading readiness) was conducted. No significant differences were found. The null hypothesis was rejected due to the possibility of a Type 2 error after the low power and effect sizes were evaluated.

No significant differences were found on the univariate analyses for the end of year LNF, PSF, or NWF. Power and effect sizes for each analysis were low. The null hypothesis for each subtest was rejected.

No differences were revealed for beginning or end of the year reading readiness as measured by the DIBELS. Significant differences were found at mid-year with children from federally supported pre-k programs yielding higher scores. This significance level was confirmed when applying the Bonferroni adjustment of $p = .012$. Differences existed at mid-year, but by the end of kindergarten the children who attended state supported pre-k seemed to have closed the achievement gap in the area of reading readiness. Both groups performed at about the same level, and there were no significant differences. Due to low power and effect sizes, there is the possibility significant differences exist.

The two groups differing at mid-year but performing at about the same levels at the end of the year could be a reflection of the kindergarten teachers’ use of the DIBELS
data to drive instruction. DIBELS is a valid and reliable assessment that provides information on each reading readiness skill (phonemic awareness, letter knowledge, and phonics) and allows educators to plan appropriate future reading instruction (Good et al., 2001). DIBELS is used to identify deficiencies in the acquisition of early reading skills in order to modify reading instruction appropriately to assist children in acquiring the essential skills. If teachers used the information from mid-year as such, the instruction would have been individualized for each child not performing at benchmark levels as identified in Table 2. This individualized instruction could have had an effect on the children who attended state funded pre-k closing the gap and achieving at similar levels by the end of the kindergarten year.

Gender was also found to be significant on ISF at mid-year with females performing significantly better than males after the more stringent alpha level of $p = .012$ was applied. By the end of the year, the covariate was no longer found to be significant. This could also be a reflection of kindergarten teachers using the DIBELS data to individualize instruction, as stated above.

Individual t-tests could have been used to analyze the data rather than MANCOVA since no significant differences were noted with the exception of the middle of the year results. Had t-tests been performed, power and effect size could have increased. However, the research used in the literature review consistently showed significant effects in the possible confounding variables identified in this research study. Since there was the possibility of significant effects of the covariates used, MANCOVA was used as the analysis. Furthermore, the research involved combining the levels of the
dependent variable into one variate, which can only be done through the use of multivariate analysis.

**Discussion and Implications**

Results from existing research has presented findings that pre-k has positive benefits for children in language, academic skills, and social competencies (Burchinal et al., 2008; Mashburn & Pianta, 2006; Mashburn et al., 2008; Wong et al., 2008). Limited research has been conducted analyzing the setting (public school, private center, faith based center) in which pre-k takes place and the characteristics that make pre-k effective. Early childhood programs have been encouraged to emphasize early reading skills for all children; therefore, research is needed to evaluate the different types of pre-k programs on reading readiness. Reading readiness also entails multiple critical skills (Fischel et al., 2007), and there exists a need to address each critical skill separately.

Results of the study are inconclusive regarding significant differences in reading readiness at the beginning of the year and end of the year when analyzing federally supported and state supported pre-k in public schools. The inconclusiveness is due to the low power and effect size. The low power and effect size were possibly due to the sample size. Because there was the possibility that race, gender, and socioeconomic status have an effect on the reading readiness dependent variable, these covariates were controlled in the analysis. To further ensure the groups were equal, the initial subtests of ISF and LNF were used as additional covariates throughout the middle of the year and end of the year analysis. Visual analysis of the relationship between the dependent variable and each covariate was reasonably linear (see Appendix A).
While differences were determined to exist at mid-year for the linear combination of ISF, LNF, PSF, and NWF and for the mid-year individual subtests of ISF and PSF, by the end of the kindergarten year there were no significant differences noted. The purpose of the study was to contribute to the body of research that supports high quality pre-k as important to the development of reading readiness and to assist in the planning for early childhood education for the future of providing quality pre-k experiences in public schools. In Alabama, educators have been waiting and hoping that the state government will more fully fund pre-k. Currently, 64 of 67 counties have state funded pre-k, but only 43 have pre-k in the public school system (Alabama Department of Children’s Affairs, 2009). State funded pre-k often does not allocate appropriate funding that allows services to be offered to the extent needed (Barnett et al., 2010). In Alabama, state funded pre-k began in 2000 and still offers a low number of programs (only 3,870 children served state-wide). The funds provided by the state impacts the number of children in pre-k as well as the quality of the program. School systems must look to other funding sources to fill this void. School systems who choose to use federal, Title I funds to provide pre-k seem to be proactive in that they are taking the initiative to address early education needs and help children begin school on a more level playing field.

While Alabama’s state funded pre-k continues to be ranked first among the states in terms of quality (Barnett et al., 2010), the current pre-k study indicates that pre-k in public school funded through other funding sources (i.e. Title I funds) can have a very similar result in reading readiness. Research shows that quality pre-k is important (Andrews & Slate, 2002; Barnett et al., 2010; Bierman et al., 2008; Burchinal et al., 2008, Gormley & Gayer, 2005; Mashburn & Pianta, 2006; Mashburn et al., 2008; Wong et al.,
and the current research implies that these high quality, effective pre-k experiences can be provided without waiting for state funding to be provided. This implies that school systems have at least one other option, using Title I funds to provide high quality pre-k.

The study will also help to fill the void of research on pre-k in Alabama and contributes to existing research that supports high quality pre-k as important to the development of four-year-olds’ reading readiness. Research can assist those in government and education to find the necessary funding for pre-k while also taking into account the characteristics and qualities of the pre-k program that make it effective. This includes the standards used and the location of the services that help make certain that pre-k is of high quality. With the increasing emphasis on accountability, school districts are seeking ways to ensure children are prepared to enter kindergarten (Gayl et al., 2009), have backgrounds to meet future academic standards (Gayl et al., 2010), participate in fewer remediation and special education programs, and graduate at higher rates (Barnett, 1996).

Assumptions, Limitations, and Recommendations for Future Research

There were several assumptions made in the research. It was assumed that the administrators of the DIBELS were trained in the administration of the instrument by the local education agency (LEA) and by the Alabama Reading Initiative (ARI), because DIBELS is a state required assessment for kindergarten through third grades. All school DIBELS teams were required to attend ARI training in order to administer this assessment. It was also assumed the results of the assessment were archived in the DIBELS database for the 2007-08 and 2008-09 school years, and access to the results
was provided to the LEA through an agreement with the University of Oregon. It was assumed the LEA would provide the results for the research. It was assumed that students in each pre-k class were assigned to their class via a lottery system. Therefore, random selection and assignment was not possible so a causal comparative research design was used for the study. Because each of the pre-k classes for the research were within the same school system it was assumed that each followed the same attendance calendar, including number of days and number of program hours daily. Because state funded pre-k classes are under the direction of the Office of School Readiness it was assumed that the federally funded units followed separate standards and guidelines. All four pre-k classes maintained at least a “5” on the ECERS-R scale since the 2007-08 school year. This led me to assume classes were of high quality providing an environment that utilized developmentally appropriate practices matched to the needs of the children.

Since the study was conducted specifically on pre-k in Alabama, there is limited generalizability to the effectiveness of pre-k in other areas of the country. This affects the external validity of the study. Furthermore, the study only examined children who attended pre-k in public school. Children who did not attend any type of pre-k prior to kindergarten were not considered. This limits the study in that it is not specifically known if pre-k itself is effective. Research is needed to extend the study to include those children who did not attend pre-k and those who attended pre-k in settings other than public school. Research is also needed specifically on pre-k in Alabama just as it exists for other high quality state funded pre-k programs in states like Georgia, Oklahoma, and North Carolina.
A further limitation was that the research conducted used a non-experimental design with intact groups and therefore could not be randomly assigned (Tabachnick & Fidell, 2007). There existed a selection threat to validity due to the use of nonequivalent groups. I selected classes that helped control for this. All four elementary schools where the pre-k classes were located were similar in terms of demographics. While demographics were similar there still existed the potential for demographics to influence the dependent variable (Meyers et al., 2006). This potential was controlled through the use of identifying gender, race, and socioeconomic status as covariates.

There was also the possibility of an implementation threat to validity. All four pre-k classes chosen employed a teacher with a minimum of a Bachelor’s degree in early childhood education. Each class utilized the same research-based curriculum and followed the same calendar and hours of operation. Furthermore, because the study utilized the causal comparative design, there were other threats to internal validity.

History was one such threat to the internal validity. Another threat was maturation; since children attended pre-k either in the 2007-08 school year or 2008-09 school year, natural development, exposure to kindergarten curriculum, and other environmental factors may have had an effect on children’s readiness to read. Since all children who participated in the study attended kindergarten in similar elementary schools within the same district that used the same research-based curriculum and pacing guides, this threat was controlled. Mortality was another area of threat to internal validity. Since the nature of causal comparative research is to identify participants after they have been exposed to the area of interest, some participants withdrew from the school system. I considered this as an exclusion criterion. Since the study was
conducted specifically in the area of pre-k in Alabama, there may be limited generalizability to the effectiveness of pre-k in other areas of the country. This affects the external validity of the study.

It would be difficult to conduct the research using experimental groups; however, this has been done in studies including the Perry Preschool Project (Schweinhart et al., 1993). Andrews and Slate (2002) called for more longitudinal studies and studies that further examine demographic variables, socioeconomic status, and family variables that could possibly have an influence on children’s readiness for kindergarten. More experimental research is needed in the field of pre-k in order to more accurately examine the effects pre-k has on reading readiness and to determine if pre-k in public school is more beneficial than pre-k in other settings. The desire for all children to begin school ready to read is at the forefront of educators’ minds as there is more and more emphasis placed on accountability. Pre-k is one part of the puzzle in preparing children for formal school and creating a more level playing field for all children.

Since it has been written that pre-k in public schools could result in more focus on readiness skills and alignment with school curriculum and standards (Conn-Powers et al., 2006), research is needed to determine the effects of public school pre-k as compared to other program locations in the area of reading readiness. The development of readiness skills at an early age can be a predictor of future reading achievement (Whitehurst & Lonigan, 1998). Therefore, research in this area would be beneficial for educators and governments to determine the best way to utilize funds in pre-k education. The current research could help provide future quality pre-k programs that allow children the opportunity to receive quality instruction and be ready for formal school experiences.
Research should also be expanded to go beyond reading readiness to include a variety of cognitive and behavioral skills. School readiness involves more than phonics, phonemic awareness, and letter knowledge. Public school pre-k also has a possible influence on transition skills that help children transfer more smoothly into kindergarten and impact future success.

Conclusions

While pre-k has been shown to be effective for different populations of children (Burchinal et al., 2008; Early et al., 2007; Magnuson et al., 2007; Mashburn & Pianta, 2006; Molfese et al., 2006; Wong et al., 2008), effectiveness can be interpreted in a variety of ways. Early childhood education is not a new idea, and after President Bush’s Goals 2000, the emphasis on high quality pre-k was highlighted. It seems to be agreed that quality, no matter the exact definition, is an important facet (Barbarin et al., 2006; Barnett et al., 2009; Clifford et al., 2005; Gormley & Gayer, 2005; Mashburn & Pianta, 2006; Mashburn et al., 2008). Currently, billions of dollars of federal, state, and local money are being spent on pre-k to promote school readiness (Barnett et al., 2010), but there is no guarantee that the pre-k is high quality. Furthermore, because pre-k located within public schools can lead to a stronger connection to the kindergarten curriculum and ease the transition into formal school, more high quality pre-k in public schools staffed with well trained teachers using developmentally appropriate practices will help children reach the first goal of Goals 2000 (Perry, 1999).

In the study no significant differences were found in state versus federally funded pre-k on reading readiness in Alabama at the beginning and end of the kindergarten year. Significant differences were noted for mid-year in the area of phonemic awareness with
the federally funded program performing at higher levels than the state funded program. The covariate gender was also found to be significant at the mid-year administration with females outperforming males in the area of phonemic awareness. This could have been due to differences in the focus on letter naming and phonemic awareness in the federally funded pre-k classes, or it could have been due to kindergarten teachers using the information gained from DIBELS subtests to individualize instruction in the area of phonemic awareness.

More variables could be introduced that affect future results, and other assessments of reading readiness may also yield different results. Future research is needed to expand on the idea of the importance of pre-k. There are so many facets of pre-k that could be included in research, including expanding studies to include those who have no pre-k experiences, behavioral and social competencies, and math skill acquisition. Furthermore, evaluating pre-k based on varying requirements dictated by funding type and location of pre-k services, especially pre-k in the public schools is an area of need. If Alabama is to continue to fund pre-k research, specifically evaluating the effectiveness of this pre-k program is paramount. It may not be as cost effective to continue state funding when federal funding is available and can possibly have similar outcomes.
REFERENCES


Gayl, C. L., Young, M., & Patterson, K. (2010). *Tapping Title I: What every school administrator should know about Title I, pre-k and school reform*. Washington


SPSS Inc: *SPSS (release 17.0) statistical software.* Chicago, IL: SPSS Inc; 2009.


University of Oregon Center on Teaching and Learning. (2008a). *DIBELS benchmark goals: Three assessment periods per year.* Retrieved from http://dibels.uoregon.edu


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Graph A1

*Gender Code with ISF1 by Pre-k Code Scatterplot*

*Note.* Pre-k code: 0 = state funded pre-k, 1 = federally funded pre-k; Gender code: 0 = male, 1 = female.
Note. Pre-k code: 0 = state funded pre-k, 1 = federally funded pre-k; Gender code: 0 = male, 1 = female.
Graph A3

*Gender Code with LNF1 by Pre-k Code Scatterplot*

*Note.* Pre-k code: 0 = state funded pre-k, 1 = federally funded pre-k; Gender code: 0 = male, 1 = female.
Graph A4

*Gender Code with LNF2 by Pre-k Code Scatterplot*

Note. Pre-k code: 0 = state funded pre-k, 1 = federally funded pre-k; Gender code: 0 = male, 1 = female.
Graph A5

*Gender Code with LNF3 by Pre-k Code Scatterplot*

*Note.* Pre-k code: 0 = state funded pre-k, 1 = federally funded pre-k; Gender code: 0 = male, 1 = female.
Graph A6
*Gender Code with PSF2 by Pre-k Code Scatterplot*

*Note.* Pre-k code: 0 = state funded pre-k, 1 = federally funded pre-k; Gender code: 0 = male, 1 = female.
Graph A7

Gender Code with PSF3 by Pre-k Code Scatterplot

Note. Pre-k code: 0 = state funded pre-k, 1 = federally funded pre-k; Gender code: 0 = male, 1 = female.
Graph A8

Gender Code with NWF2 by Pre-k Code Scatterplot

Note. Pre-k code: 0 = state funded pre-k, 1 = federally funded pre-k; Gender code: 0 = male, 1 = female.
Graph A9
*Gender Code with NWF3 by Pre-k Code Scatterplot*

*Note.* Pre-k code: 0 = state funded pre-k, 1 = federally funded pre-k; Gender code: 0 = male, 1 = female.
Graph A10

Race Code with ISF1 by Pre-k Code Scatterplot

Note. Pre-k code: 0 = state funded pre-k, 1 = federally funded pre-k; Race code: 0 = African American, 1 = Caucasian, 2 = Hispanic, 3 = Multi-race, 4 = Asian.
Graph A11
Race Code with ISF2 by Pre-k Code Scatterplot

Note. Pre-k code: 0 = state funded pre-k, 1 = federally funded pre-k; Race code: 0 = African American, 1 = Caucasian, 2 = Hispanic, 3 = Multi-race, 4 = Asian.
Graph A12

*Race Code with LNF1 by Pre-k Code Scatterplot*

*Note.* Pre-k code: 0 = state funded pre-k, 1 = federally funded pre-k; Race code: 0 = African American, 1 = Caucasian, 2 = Hispanic, 3 = Multi-race, 4 = Asian.
Graph A13

Race Code with LNF2 by Pre-k Code Scatterplot

Note. Pre-k code: 0 = state funded pre-k, 1 = federally funded pre-k; Race code: 0 = African American, 1 = Caucasian, 2 = Hispanic, 3 = Multi-race, 4 = Asian.
Graph A14
Race Code with LNF3 by Pre-k Code Scatterplot

Note. Pre-k code: 0 = state funded pre-k, 1 = federally funded pre-k; Race code: 0 = African American, 1 = Caucasian, 2 = Hispanic, 3 = Multi-race, 4 = Asian.
Graph A15

Race Code with PSF2 by Pre-k Code Scatterplot

Note. Pre-k code: 0 = state funded pre-k, 1 = federally funded pre-k; Race code: 0 = African American, 1 = Caucasian, 2 = Hispanic, 3 = Multi-race, 4 = Asian.
Graph A16

Race Code with PSF3 by Pre-k Code Scatterplot

Note. Pre-k code: 0 = state funded pre-k, 1 = federally funded pre-k; Race code: 0 = African American, 1 = Caucasian, 2 = Hispanic, 3 = Multi-race, 4 = Asian.
Graph A17
*Race Code with NWF2 by Pre-k Code Scatterplot*

*Note.* Pre-k code: 0 = state funded pre-k, 1 = federally funded pre-k; Race code: 0 = African American, 1 = Caucasian, 2 = Hispanic, 3 = Multi-race, 4 = Asian.
Graph A18

Race Code with NWF3 by Pre-k Code Scatterplot

Note. Pre-k code: 0 = state funded pre-k, 1 = federally funded pre-k; Race code: 0 = African American, 1 = Caucasian, 2 = Hispanic, 3 = Multi-race, 4 = Asian.
Graph A19

*SES Code with ISF1 by Pre-k Code Scatterplot*

*Note.* Pre-k code: 0 = state funded pre-k, 1 = federally funded pre-k; SES code: 0 = free/reduced lunch, 1 = paid lunch.
Graph A20

*SES Code with ISF2 by Pre-k Code Scatterplot*

Note. Pre-k code: 0 = state funded pre-k, 1 = federally funded pre-k; SES code: 0 = free/reduced lunch, 1 = paid lunch.
Graph A21

SES Code with LNF1 by Pre-k Code Scatterplot

Note. Pre-k code: 0 = state funded pre-k, 1 = federally funded pre-k; SES code: 0 = free/reduced lunch, 1 = paid lunch.
Graph A22

*SES Code with LNF2 by Pre-k Code Scatterplot*

*Note.* Pre-k code: 0 = state funded pre-k, 1 = federally funded pre-k; SES code: 0 = free/reduced lunch, 1 = paid lunch.
Graph A23

*SES Code with LNF3 by Pre-k Code Scatterplot*

*Note.* Pre-k code: 0 = state funded pre-k, 1 = federally funded pre-k; SES code: 0 = free/reduced lunch, 1 = paid lunch.
Graph A24

*SES Code with PSF2 by Pre-k Code Scatterplot*

*Note.* Pre-k code: 0 = state funded pre-k, 1 = federally funded pre-k; SES code: 0 = free/reduced lunch, 1 = paid lunch.
Graph A25

*SES Code with PSF3 by Pre-k Code Scatterplot*

Note. Pre-k code: 0 = state funded pre-k, 1 = federally funded pre-k; SES code: 0 = free/reduced lunch, 1 = paid lunch.
Graph A26

*SES Code with NWF2 by Pre-k Code Scatterplot*

Note. Pre-k code: 0 = state funded pre-k, 1 = federally funded pre-k; SES code: 0 = free/reduced lunch, 1 = paid lunch.
Graph A27

**SES Code with NWF3 by Pre-k Code Scatterplot**

*Note.* Pre-k code: 0 = state funded pre-k, 1 = federally funded pre-k; SES code: 0 = free/reduced lunch, 1 = paid lunch.
Graph A28

*Linearity Scatterplots for Each Combination of Variables*

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*Note.* ISF1 = Initial Sound Fluency for the beginning of year measures phonemic awareness; ISF2 = Initial Sound Fluency for middle of year measures phonemic awareness; LNF1 = Letter Naming Fluency for the beginning of year measures letter knowledge; LNF2 = Letter Naming Fluency for the middle of year measures letter knowledge; LNF3 = Letter Naming Fluency for the end of year measures letter knowledge; PSF2 = Phoneme Segmentation Fluency for the middle of year phonemic awareness; PSF3 = Phoneme Segmentation Fluency for the end of year measures phonemic awareness; NWF2 = Nonsense Word Fluency for the middle of year measures phonics; NWF3 = Nonsense Word Fluency for the end of year measures phonics.
APPLICATION TO USE HUMAN RESEARCH SUBJECTS

Liberty University

Committee On The Use of Human Research Subjects

1. Project Title: The Differences in Reading Readiness Among Kindergartners who Attended State and Federally Funded Pre-k in Alabama

2. Full Review □ Expedited Review □

3. Funding Source (State N/A if not applicable): N/A

4. Principal Investigator:
   Kelli Moore Tucker, doctoral student
   334-497-0032, ketucker2@liberty.edu, 1812 27th Street Valley, AL 36854
   Name and Title Phone, E-mail, correspondence address

5. Faculty Sponsor (if student is PI), also list co-investigators below Faculty Sponsor, and key personnel:
   Dr. Rollen Fowler
   rcfowler@liberty.edu
   Name and Title Dept., Phone, E-mail address

6. Non-key personnel:
   Name and Title Dept., Phone, E-mail address

7. Consultants:
   Dr. Amanda Rockinson-Szapkiw
   aszapkiw@liberty.edu
   Name and Title Dept., Phone, E-mail address

8. The principal investigator agrees to carry out the proposed project as stated in the application and to promptly report to the Human Subjects Committee any proposed changes and/or unanticipated problems involving risks to subjects or others participating in approved project in accordance with the Liberty Way and the Confidentiality Statement. The principal investigator has access to copies of 45 CFR 46 and the Belmont Report. The principal investigator agrees to inform the Human Subjects Committee and complete all necessary reports should the principal investigator
terminate University association. Additionally s/he agrees to maintain records and keep informed consent documents for three years after completion of the project even if the principal investigator terminates association with the University.

____Kelli M. Tucker_______  _____May 11, 2011_____
Principal Investigator Signature  Date

____Rollen C. Fowler_______  _____May 11, 2011_____
Faculty Sponsor (If applicable)  Date

Submit the original request to: Liberty University Institutional Review Board, CN Suite 1582, 1971 University Blvd., Lynchburg, VA 24502. Submit also via email to irb@liberty.edu

APPLICATION TO USE HUMAN RESEARCH SUBJECTS

10. This project will be conducted at the following location(s): (please indicate city & state)
- [ ] Liberty University Campus
- [x] Other (Specify): Chambers County School System, LaFayette, AL

11. This project will involve the following subject types: (check-mark types to be studied)
- [ ] Normal Volunteers (Age 18-65)
- [ ] Subjects Incapable Of Giving Consent
- [ ] In Patients
- [ ] Prisoners Or Institutionalized
- [ ] Out Patients
- [x] Subjects Incapable Of Giving Consent
- [ ] Patient Controls
- [x] Minors (Under Age 18)
- [ ] Fetuses
- [ ] Over Age 65
- [ ] University Students (PSYC)
- [ ] Cognitively Disabled
- [x] Other Potentially Elevated
- [ ] Physically Disabled
- [ ] Pregnant Women
12. Do you intend to use LU students, staff or faculty as participants in your study? If you do not intend to use LU participants in your study, please check “no” and proceed directly to item 13.

YES ☐ NO ☑

If so, please list the department and/classes you hope to enlist and the number of participants you would like to enroll.

________________________________________________________

In order to process your request to use LU subjects, we must ensure that you have contacted the appropriate department and gained permission to collect data from them.

Signature of Department Chair:

________________________________________________________

Department Chair Signature(s) Date

13. Estimated number of subjects to be enrolled in this protocol: 144

14. Does this project call for: (check-mark all that apply to this study)

☐ Use of Voice, Video, Digital, or Image Recordings?

☐ Subject Compensation? Patients $_____; Volunteers $_____

☐ Participant Payment Disclosure Form

☐ Advertising For Subjects? More

☐ More Than Minimal Risk?

☐ More Than Minimal Psychological Stress? Alcohol

☐ Consumption?

☐ Confidential Material (questionnaires, photos, etc.)? Waiver of Informed Consent?

☐ Extra Costs To The Subjects (tests, hospitalization, etc.)? VO2 Max Exercise?

☐ The Exclusion of Pregnant Women?

☐ The Use of Blood? Total Amount of Blood ______ Over Time Period (days) ______

☐ The Use of rDNA or Biohazardous materials?

☐ The Use of Human Tissue or Cell Lines?

☐ The Use of Other Fluids that Could Mask the Presence of Blood (Including Urine and Feces)?

☐ The Use of Protected Health Information (Obtained from Healthcare Practitioners or Institutions)?
15. This project involves the use of an **Investigational New Drug** (IND) or an **Approved Drug For An Unapproved Use**.

☐ YES  ☒ NO

Drug name, IND number and company: ____________________________

16. This project involves the use of an **Investigational Medical Device** or an **Approved Medical Device For An Unapproved Use**.

☐ YES  ☒ NO

Device name, IDE number and company: ____________________________

17. The project involves the use of **Radiation or Radioisotopes**:

☐ YES  ☒ NO

18. Does investigator or key personnel have a potential conflict of interest in this study?

☐ YES  ☒ NO

EXPEDITED/FULL REVIEW APPLICATION NARRATIVE

A. **PROPOSED RESEARCH RATIONALE** (Why are you doing this study?)

[Excluding degree requirement] The purpose of this study is to compare public school pre-kindergarten programs, state funded versus federally funded, to determine which program is more effective in teaching and improving the reading readiness skills of pre-k students. This study will also contribute to the body of research that supports high quality pre-k as important to the development of four-year-olds’ reading readiness upon entering kindergarten. Specifically, this research will assist those in the field of early education plan for future funding sources and how best to provide quality pre-k in the public schools. In addition, the research will assist funding entities with the capacity to understand and more fully consider the characteristics or qualities of the pre-k program, standards, and location of services.

B. **SPECIFIC PROCEDURES TO BE FOLLOWED**

- In a step-by-step manner, using simple, nonscientific language, provide a description of the procedures of the study and data collection process. Also, describe what your subjects will be required to do. (Note: Sections C and D deal with type of subjects and their recruitment. That information does not need to be included here.)
  - Obtain approval from IRB at Liberty University and from [insert name] School System to conduct the study.
  - Contact via telephone the pre-k director and testing coordinator of the [insert name] School System to schedule an appointment to present the proposed research.
  - Meet with pre-k director and testing coordinator in the [insert name] School System to describe the study, answer any questions or address concerns, and
request data of students who attended pre-k during the 2007-08 and 2008-09 school years. The data requested will include each child identifiable by a research code only assigned by the school system, the pre-k attended, year attended, race, gender, lunch status, current elementary school attending, and DIBELS scores for each subtest. There will be no names or other personally identifiable information since each student will have been assigned a research code by the school system prior to releasing the data to the researcher.

- After the information has been received from the school system, the information will be entered into a table in Excel.
- The Excel spreadsheet will then be opened in SPSS and the researcher will code the nominal data including pre-k attended, gender, race, lunch status, and elementary school attended for kindergarten.
- The DIBELS data will be coded for level including low risk/benchmark, some risk/strategic, and at risk/intensive.
- SPSS will be used to calculate the statistical results using MANCOVA since there are multiple levels of the independent variable pre-k and multiple levels of the dependent variable. MANCOVA helps to equate groups on the confounding variables (race, gender, lunch status).

C. SUBJECTS

Who do you want to include in your study? Please describe in nonscientific language:

- The inclusion criteria for the subject populations including gender, age ranges, ethnic background, health status and any other applicable information. Provide a rationale for targeting those populations.
  - The sample data will be archived data and includes data from children who attended pre-k in 2007-08 or 2008-09 regardless of race, gender or socioeconomic status. All children were four years old by September 1 of their pre-k year. The children will either be in first or second grade when the data is collected; however, the data collected is anonymous archived data and cannot be connected with individual children in any way. The data for all children who attended one of the four pre-k classrooms selected for this study will be included unless the data fits the exclusion criteria.
  - The exclusion criteria for subjects.
    - The only exclusion criteria is if the child moved away from the school district after having attended pre-k their data will be excluded from the research.
  - Explain the rationale for the involvement of any special populations (Examples: children, specific focus on ethnic populations, mentally retarded, lower socio-economic status, prisoners)
    - Children were chosen for this study since it is proposed to examine reading readiness of children.
  - Provide the maximum number of subjects you seek approval to enroll from all of the subject populations you intend to use and justify the sample size. You will not be approved to enroll a number greater than this. If at a later time it becomes apparent you need to increase your sample size, you will need to submit a Revision Request.
- A sample size of 144 is the goal.
- Pre-k classes enroll a maximum of 18 students per class. This research will be examining the archived data of four pre-k classes from a two year period. Therefore, the maximum sample can only be 144.
- **For NIH, federal, or state funded protocols only:** If you do not include women, minorities and children in your subject pool, you must include a justification for their exclusion. The justification must meet the exclusionary criteria established by the NIH.

### D. RECRUITMENT OF SUBJECTS AND OBTAINING INFORMED CONSENT
- Describe your recruitment process in a straightforward, step-by-step manner. The IRB needs to know all the steps you will take to recruit subjects in order to ensure subjects are properly informed and are participating in a voluntary manner. An incomplete description will cause a delay in the approval of your protocol application.
  - Since the research is ex post facto the subjects will be identified after they have been exposed to the area of interest. Therefore, there will be no recruitment of subjects.
  - The researcher will request waiver of consent from IRB at Liberty University due to several factors: 1) the study involves minimal risk since this is information that is generally collected by a school system, 2) the study involves secondary data analysis and no manipulation of variables will be taking place, 3) since there is no manipulation of variables there will be no adverse affects on subjects, 4) since the proposed participants will have been exposed to the independent variable pre-k two years prior to the data being requested consent would be impractical.
  - Since research codes will be assigned to the students from the school system prior to the data being released to the researcher, there will be no personally identifiable information and therefore not a FERPA issue.

### E. PROCEDURES FOR PAYMENT OF SUBJECTS
- Describe any compensation that subjects will receive. Please note that Liberty University Business Office policies might affect how you can compensate subjects. Please contact your department’s business office to ensure your compensation procedures are allowable by these policies.
  - Not applicable

### F. CONFIDENTIALITY
- Describe what steps you will take to maintain the confidentiality of subjects.
In order to ensure confidentiality of subjects, each student will be assigned a research code by the school system prior to providing the data to the researcher. No student names will be used. There will be no key to the research codes provided to the researcher.

Location of pre-k and location of kindergarten classroom will be coded in SPSS but locations will not be disclosed in the narrative of the findings.

The location of the school system will not be disclosed in the narrative, only referred to as a system in the southeast.

Describe how research records, data, specimens, etc. will be stored and for how long.

Information received from the school system will be stored on a password protected flash drive that is personal property of the researcher. The flash drive is stored in a fire proof safe when not in use.

All paper copies of records received from the school system will be shredded as soon as the information is transferred to the Excel spreadsheet used to store all the data.

The data will be kept electronically on the flash drive for three years.

The flash drive will have all files deleted after five years, and the drive will be destroyed.

Describe if the research records, data, specimens, etc. will be destroyed at a certain time. Additionally, address if they may be used for future research purposes.

The records will not be used for future research.

G. POTENTIAL RISKS TO SUBJECTS

There are always risks associated with research. If the research is minimal risk, which is no greater than every day activities, then please describe this fact.

The risk is minimal. This information is of the type that is routinely collected by the school system. The school system will remove the student names and assign a research code prior to providing the information to the researcher.

Describe the risks to participants and steps that will be taken to minimize those risks. Risks can be physical, psychological, economic, social, legal, etc.

Because the research uses secondary data collected after the participants have been exposed to the area of interest, there will be no risks to the participants.

Where appropriate, describe alternative procedures or treatments that might be advantageous to the participants.

Not applicable
Describe provisions for ensuring necessary medical or professional intervention in the event of adverse effects to participants or additional resources for participants.

- Not applicable

H. BENEFITS TO BE GAINED BY THE INDIVIDUAL AND/OR SOCIETY

- Describe the possible direct benefits to the subjects. If there are no direct benefits, please state this fact.
  - There will be no direct benefit to the subjects.
- Describe the possible benefits to society. In other words, how will doing this project be a positive contribution and for whom?
  - This research will assist those in the field of early education plan for future funding sources and how best to provide quality pre-k in the public schools. In addition, the research will assist funding entities with the capacity to understand and more fully consider the characteristics or qualities of the pre-k program, standards, and location of services.

I. INVESTIGATOR'S EVALUATION OF THE RISK-BENEFIT RATIO

Here you explain why you believe the study is still worth doing even with any identified risks.

- The risk involved is minimal since the researcher will not interact with the participants and all identifying information will be removed from the data analyzed. The study is worthy because pre-k is a relatively new concept in Alabama and more research is needed to support the continued funding, as well as possible increased funding. It is also important for funding entities to realize the many ways in which pre-k can be funded and more fully consider the characteristics or quality of pre-k program, standards, and location of services.

J. WRITTEN INFORMED CONSENT FORM

(Please attach to the Application Narrative. See Informed Consent IRB materials for assistance in developing an appropriate form. See K below if considering waiving signed consent or informed consent)

K. WAIVER OF INFORMED CONSENT OR SIGNED CONSENT

Waiver of consent is sometimes used in research involving a deception element. Waiver of signed consent is sometimes used in anonymous surveys or research involving secondary data. See Waiver of Informed Consent information on the IRB website. If requesting either a waiver of consent or a waiver of signed consent, please address the following:

1. For a Waiver of Signed Consent, address the following:
   a. Does the research pose greater than minimal risk to subjects (greater than everyday activities)?
   b. Does a breech of confidentiality constitute the principal risk to subjects?
c. Would the signed consent form be the only record linking the subject and the research?
d. Does the research include any activities that would require signed consent in a non-research context?
e. Will you provide the subjects with a written statement about the research (an information sheet that contains all the elements of the consent form but without the signature lines)?

2. For a Waiver of Consent Request, address the following:
   a. Does the research pose greater than minimal risk to subjects (greater than everyday activities)?
      - There is only minimal risk.
   b. Will the waiver adversely affect subjects’ rights and welfare? Please justify?
      - The study involves secondary data analysis on information generally collected in the school system. Furthermore, data is being requested after subjects were exposed to the area of interest. Since no manipulation of variables is taking place there will be no adverse affects on subjects’ rights and welfare.
   c. Why would the research be impracticable without the waiver?
      - The data to be analyzed is being requested after subjects were exposed to the independent variable, pre-k.
   d. How will subject debriefing occur (i.e., how will pertinent information about the real purposes of the study be reported to subjects, if appropriate, at a later date?)
      - Not applicable

L. SUPPORTING DOCUMENTS (to be attached to the Application Narrative)

M. COPIES:
For investigators requesting Expedited Review or Full Review, email the application along with all supporting materials to the IRB (irb@liberty.edu). Submit one hard copy with all supporting documents as well to the Liberty University Institutional Review Board, Campus North Suite 1582, 1971 University Blvd., Lynchburg, VA 24502.
May 27, 2011

Kelli Tucker
IRB Exemption 1115.052711: The Differences in Reading Readiness among Kindergartners who Attended State and Federally Funded Pre-K in Alabama

Dear Kelli,

The Liberty University Institutional Review Board has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study to be exempt from further IRB review. This means you may begin your research with the data safeguarding methods mentioned in your approved application, and that no further IRB oversight is required unless your data collection extends past the one year approval granted by this memo, in which case you would submit the annual review form attached to your approval email.

Your study falls under exemption category 46.101 (b)(4), which identifies specific situations in which human participants research is exempt from the policy set forth in 45 CFR 46:

(4) Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

Please note that this exemption only applies to your current research application, and that any changes to your protocol must be reported to the Liberty IRB for verification of continued exemption status. You may report these changes by submitting a new application to the IRB and referencing the above IRB Exemption number.

If you have any questions about this exemption, or need assistance in determining whether possible changes to your protocol would change your exemption status, please email us at irb@liberty.edu.

Sincerely,

Fernando Garzon, Psy.D.
IRB Chair, Associate Professor
Center for Counseling & Family Studies

(434) 592-5054

Liberty University
40 Years of Training Champions for Christ: 1971-2011
May 7, 2011

To: Superintendent [Name]

From: Kelli M. Tucker
Doctoral Student, Liberty University

Dear Superintendent [Name],

As a doctoral dissertation requirement, I am collecting information related to my particular area of interest: The Differences in Reading Readiness Among Kindergartners who Attended State and Federally Funded Pre-k in Alabama. The results of this research are intended to contribute to the body of research that supports high quality pre-k as important to the development of four-year-olds’ reading readiness upon entering kindergarten.

Recognizing how the [Name] School District is currently a pioneer in providing pre-k services to children by utilizing state and federally funded units rather than providing the minimum number of state funded pre-k units, your school district and personnel are ideal for my doctoral dissertation study. As a result, I would like to request your permission to collect kindergarten DIBELS data for the children who attended pre-k in the 2007-08 and 2008-09 school years. If you agree, I will collect the DIBLES data according to your instructions. Since this study uses archived data, I will not be receiving consent from participants.

All information received will remain and be used anonymously. Results of this study will only be shared with my dissertation chair and you. While data will be included in my dissertation, I will not identify information specific to any individual or school within your system.

I greatly appreciate your consideration of my request. If you have questions or need additional information, you may contact me by e-mail at ketucker2@liberty.edu or telephone at (334) 497-0032. You may also contact my dissertation committee chairperson, Dr. Rollen Fowler, by email at rcfowler@liberty.edu or telephone at (503) 896-3298.

Sincerely yours,

Kelli M. Tucker

Kelli M. Tucker
May 12, 2011

Institutional Review Board
Liberty University
CN Suite 1582
1971 University Blvd.
Lynchburg, VA 24502

Dear IRB Members,

After reviewing the proposed study, “The Differences in Reading Readiness Among Kindergartners Who Attended State and Federally Funded Pre-k in Alabama”, presented by Ms. Kelli Tucker a graduate student at Liberty University, I have granted permission for the study to be conducted in the School District.

The purpose of this study aligns with the vision of Schools in providing early educational experiences that promote the development of four-year-olds and impact the educational experiences that will be encountered in kindergarten and beyond.

I expect that the entire project will end no later than May 31, 2012. Ms. Tucker will contact and present the study to the Pre-k Director and Testing Coordinator as soon as approval is received from IRB. Ms. Tucker is responsible for coordinating all data collection with the Pre-k Director and Testing Coordinator.

I understand that Ms. Tucker will not be receiving consent for participants since this study utilizes archived data. I have confirmed that she has the cooperation of the school system staff. Ms. Tucker has agreed to provide to my office a copy of all Liberty University IRB-approved documents before she collects data from the district. Any data collected by Ms. Tucker will be assigned a research code from the school district. Ms. Tucker has also agreed to provide us with a copy of the aggregate results from her study.

If the IRB has any concerns about the permission being granted by this letter, please contact me at the number provided within the letterhead.

Sincerely,

School District