# KINDERGARTEN TEACHER KNOWLEDGE OF PHONEMIC AWARENESS AND INSTRUCTION:

# DEVELOPING PROFICIENT EARLY READERS

A Dissertation

Presented in Partial Fulfillment of the Requirements for the

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by

Dana Harris

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Major Professor: Russell Joki, Ed.D

# AUTHORIZATION TO SUBMIT DISSERTATION

This dissertation of Dana Harris, submitted for the degree of Doctor of Philosophy in Education with a major in Educational Leadership and titled "Kindergarten Teacher Knowledge of Phonemic Awareness and Instruction: Developing Proficient Early Readers," has been reviewed in final form. Permission, as indicated by the signatures and dates given below, is now granted to submit final copies.

| | | |
|---|---|---|
| Committee Chair | Dr. Russell Joki | Date 4-11-16 |
| Committee Members | Dr. Taylor Raney | Date 4-11-16 |
| | Dr. Crystalee Sweeting | Date 4-18-16 |
| Doctoral Program Director | Dr. Heidi Curtis | Date 4-11-16 |
| College of Adult and Graduate Studies, Dean | Dr. Paula Kellerer | Date 4/29/16 |

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# DEDICATION

This dissertation is dedicated to my husband, Pete, who has always encouraged my pursuit of learning no matter the path. He cooked, cleaned, and did the laundry. He did it all.

I also dedicate this work to my daughter, Autumn, who patiently listened to my thoughts. I also want to thank Jaxon, a very active three-year-old, who waited patiently for Gramma to finish her schoolwork before she could play ball with him.

# ABSTRACT

Reading proficiently opens doors to college and career pathways. The success of children depends on this fundamental skill, yet students are failing to learn to read. This research investigated the relationship between teacher knowledge of phonemic awareness and the development of early literacy skills in kindergarten students. The study was conducted in a suburban school district of more than 20,000 students. This study sought to identify a kindergarten teacher profile linked to positive student achievement growth in phonemic awareness. The participants included 1,258 kindergarten students and 57 classroom teachers from 21 different elementary schools. Participants ranged between 5- and 7-years old who attended full-time kindergarten classes. Kindergarten student data was collected from the Dynamic Indicators of Basic Early Literacy Skills (DIBELS Next Edition, 2011) assessment. Kindergarten classroom teachers were assessed on their knowledge of phonemic awareness. Teacher demographic data, student growth scores, and results on the kindergarten teacher knowledge assessment were used to create teacher profiles associated with positive student achievement growth in their corresponding classroom. The results of the study demonstrated no clear kindergarten teacher profile correlated to student performance on the phonemic awareness measure. Findings may be useful when identifying effective instructional materials for teaching phonemic awareness to kindergarten students. A possible explanation for increased levels of student achievement may be the degree to which the kindergarten teacher utilized the provided phonemic awareness instructional materials. Recommendations for future studies would be investigation into the relationship between the use of phonemic awareness instructional materials with fidelity and kindergarten student achievement.

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## Introduction

The stakes are high, and relevant federal agencies know it. Proficient reading is critical for educational and personal success as adults (Cascio & Schanzenbach, 2013; Chetty et al., 2011; Reading & Van Deuren, 2007; Torgeson, 2000; Walsh, 2009). Children with below average reading ability are at an increasing disadvantage within a society where demands for effective reading skills in the workplace are growing rapidly (US Department of Education, 2014; US Department of Labor, 2014). Education significantly impacts earning levels throughout life (Bartik, 2014; Cascio & Schanzenbach, 2013; Chetty et al., 2011; Dynarski, Hyman, & Schanzenbach, 2013; US Department of Labor, 2014; Walters, 2014). Not surprising, Baer and Sabatini (2009) found adults with the least amount of schooling were the lowest performers on a variety of reading tasks. Low income adults scored lower in reading proficiency compared to adults in other income categories (Baer & Sabatini, 2015). While 17% of adults in the nation are represented in the poverty category, this same group represents 58% of the adults scoring lower in proficiency ratings on reading assessments (Baer & Sabatini, 2015). The average college graduate earned 62% more than the average high school graduate (National Center for Educational Statistics, 2015). This earnings pattern remained consistent during 2005 through 2013 (National Center for Educational Statistics, 2015).

Increasing literacy among children and adults is sound public policy and an educational necessity (Bartik, 2014; Chandler, 2014; Duncan & Magnuson, 2013; Walters, 2014). Inequalities exist in education today. Children born into poor families have only a 9% chance of obtaining a college degree while the odds improve to 54% for high-income families (Dynarski, 2015). For each dollar spent by the public on high-quality preschool education, the return is $7 as

a result of a reduced need for other programs such as remediation and special education (US Department of Education, 2014). In addition, children who benefit from such programs reach adulthood with increased productivity and earnings (Bartik, 2014; Cascio & Schanzenbach, 2013; Chandler, 2014; Chetty et al., 2011; Duncan & Magnuson, 2013; Dynarski et al., 2013; Walters, 2014).

The National Institutes of Health, the United States Office of Education, and multiple private foundations have provided substantial funding for reading research in recognition of the serious consequences of reading failure in America (Torgeson, 2000; Walsh, 2009). Through the United States Department of Education Reading First Program, states and districts received funds to support all children reading at high levels by the end of third grade (US Department of Education, 2014). The field of literacy has seen significant changes in the last decade; however early intervention and early literacy remain key topics (Carlson, Gillon, & Boustead, 2013; Cassidy & Ortlieb, 2012).

Researchers cite the lack of phonological awareness skills as a reason for failing to learn to read proficiently (Foorman, Francis, Fletcher, & Lynn, 1996; Hurford, Schauf, Bunce, Blaich, & Moore, 1994; Stanovich & Siegel, 1994; Vloedgraven & Verhoeven, 2007; Wagner, Torgeson, & Rashotte, 1994). Despite all the attention focused on phonological awareness and reading development, the role of phonemic awareness in typically developing young children has remained largely undefined (Ouellette & Haley, 2013). Research also demonstrated that the connection between phonological awareness, and therefore, phonemic awareness, is much more complex than many initially believed (Norman & Malicky, 1999).

This study examined two critical areas associated with the acquisition of phonemic awareness that impacts reading development in young children. First, it investigated the depth of

knowledge teachers possess in the area of phonemic awareness. Second, it examined the correlation of teacher knowledge about phonemic awareness with student achievement in phonemic awareness. Information about teacher knowledge of phonemic awareness was gathered from a teacher survey, the Survey of Teacher PhAKS (Phonemic Awareness, Knowledge, and Skills). Student achievement data was collected at two points during the school year through the use of the Dynamic Indicators of Basic Early Literacy Skills (DIBELS Next Edition) Assessment. The correlation analysis assessed the relationship of teacher knowledge about phonemic awareness and student achievement in phonemic awareness.

**Statement of the Problem**

Common agreement exists that reading proficiency is critical for academic and personal success (Bartik, 2014; Chetty et al., 2011; Dynarski et al., 2013; Moats & Foorman, 2003; National Reading Panel, 2000; Reading & Van Deuren, 2007; US Department of Labor, 2014; Walters, 2014). Broad agreement exists that general linguistic skills are critical prerequisites for learning to read proficiently (Carson et al., 2013; Mann & Foy, 2003; Lyster, 2002; National Reading Panel, 2000; Torppa et al., 2007; Vandervelden & Siegel, 1995). Phonological awareness is recognized as a strong predictor of early reading proficiency and so has been at the center of the reading research for the past two decades (Ouellette & Haley, 2013). However, according to the National Assessment of Educational Progress (NAEP) results, there was no significant change in fourth-grade reading scores from 2009 to 2011 (National Center for Education Statistics, 2011).

Making a successful transition to kindergarten is a critical and memorable milestone for children (McClelland et al., 2007; Ponitz, McClelland, Matthews, & Morrison, 2009). Numerous studies demonstrate that phonological ability in kindergarten is a critical factor in predicting

reading performance in the early years of school (Ehri et al., 2001; Engen & Hoien, 2002; Lundberg, Larsman, & Strid, 2012; McCutchen et al., 2002; National Reading Panel, 2000; Ryder, Tunmer, & Greaney, 2008); Schuele & Boudreau, 2008; Torppa et al., 2007; Vandervelden & Siegel, 2001).

Opportunity gaps appear early, with children from poor families entering school less prepared than their kindergarten classmates. (Dynarski, 2015) Reading trajectories are developed early, and students on a low trajectory tend to remain on that path, falling further behind peers (Kaminski & Good, 2011). If identified early and provided with targeted intervention, students at risk for reading problems can see these reading difficulties reduced significantly or prevented (Catts, Fey, Zhang, & Tomblin, 2001; Fielding, Kerr, & Rosier, 2007; Hurford et al., 1994; Jenkins, Hudson, & Johnson, 2007; Kaminski & Good III, 2011; Torgeson, 2000; Welsh, Nix, Blair, Bierman, & Nelson, 2010).

Despite significant research and professional development, many early childhood educators lack basic understanding of the skills comprising phonological awareness and how to foster phonemic awareness growth in young students (Moats & Foorman, 2003; Phillips, Clancy-Menchetti, & Longian, 2008). Few teachers deliver high-quality instruction even when employing specific literacy curricula (Moats & Foorman, 2003; Vesay & Gischlar, 2013). Even with best intentions from educators, lack of knowledge of phonemic awareness makes it difficult for young children to acquire necessary skills (Bos, Mather, Dickson, Podhajski, & Chard, 2001; Cheesman, McGuire, Shankweiler & Coyne, 2009; Landry, Anthony, Swank, & Monseque-Bailey, 2009; McCutchen et al., 2002; Moats, 2011; Spear-Swerling, Brucker, & Alfano, 2005; Vesay & Gischlar, 2013). Contrary to the attention given to phonological awareness, smaller-segment phonemic awareness has generally remained unidentified (Alcock, Ngorosho, Deus, &

Jukes, 2010; Ouellette & Haley, 2013). Few studies have investigated teacher knowledge regarding language and reading (Moats & Foorman, 2003).

**Purpose of the Study**

This study investigated the relationship between kindergarten teacher knowledge of phonemic awareness and student performance in phonemic awareness at the kindergarten level. The first aspect of this study investigated to what extent kindergarten teachers possess the necessary skills in phonemic awareness required to teach phonemic awareness to kindergarten students. This first research question also investigated the relationship between kindergarten teacher knowledge of phonemic awareness and the developing phonemic awareness skills in kindergarten students. The second question addressed the relationship between kindergarten teacher knowledge of phonemic awareness, years of teaching, and type of degree held by the teacher.

Experienced educators stress that kindergarten students who perform below standard in reading proficiency, and particularly phonological skills, rarely close the achievement gap (Hurford et al., 1994; Kaminski & Good III, 2011). Individual performance remains slightly below proficient readers throughout their elementary years. A small, but increasing body of evidence suggests educators knowledgeable in phonological awareness can positively impact student outcomes (Bos et al., 2001; Cheesman et al., 2009; McCutchen et al., 2002; Moats & Foorman, 2003). Teachers must demonstrate knowledge regarding the similarities and differences between oral language and written language to address the needs of all children, particularly with students struggling to learn to read (Bos et al., 2001; Cheesman et al., 2009; Moats & Foorman, 2003).

Bos et al., (2001) found that 53% of pre-service educators and 60% of in-service educators inaccurately responded to half of the knowledge of language structures questions in their survey testing phonemic awareness. While more than 50 percent of the preservice and inservice educators were able to successfully identify phonemes in two-phoneme words, the same participants were unable to do this in four-phoneme words (Bos et al., 2001). While both in-service and pre-service educators reported teachers of young children should have knowledge in teaching phonics, educators' test results on phonics knowledge assessment questions revealed they lacked these basic skills (Bos et al., 2001; Vesay & Vischlar, 2013).

Researchers found that K-3 teachers had inadequate knowledge of the importance of phonemic awareness and its critical role in reading development (Bos et al., (2001); McCutchen et al., 2002; Vesay and Vischlar (2013). Implications suggest teachers are confused by the distinctions between phonological awareness and phonics (Bos et al., 2001; Cheesman et al., 2009; Walsh, 2009). A related hypothesis holds that teachers may not understand the role of phonemic awareness within the larger construct of phonological awareness (Bos et al., 2001; Cheesman et al., 2009; Walsh, 2009). A second implication of the Bos et al., (2001) research suggests that even with advances in reading instruction at the state and national levels, there has not been a significant impact on educators' knowledge and practice. Additional research is needed to better understand the correlation between teacher knowledge and students' achievement in reading (Bos et al., 2001; Cheesman et al., 2009). Further research is warranted regarding whether kindergarten teachers possess enough phonemic awareness knowledge to teach the skills effectively (Ehri et al., 2001).

In this study, involvement in multiple school settings, and using a quantitative approach, allowed a sizable data sample (Creswell, 2014). Correlating teacher demographic data with

teacher knowledge of phonemic awareness led to the identification of educator profiles. Individual student assessment data regarding phonemic awareness was compared to the teacher profiles. Using quantitative research methodology, emerging patterns were identified. These patterns may help educators understand barriers that impede phonemic awareness development in young children. Armed with this understanding, administrators and teachers may be better capable of supporting parents and preschools with suggestions and models for early phonemic awareness development (Ackerman & Barnett, 2005; Landry et al., 2009; Phillips et al., 2008).

Quality early education is fundamental to having students develop the skills they need to succeed (Chetty et al., 2011; Landry et al., 2009; McCutchen et al., 2002; Moats & Foorman, 2003). Children supported by teachers with strong knowledge and instructional techniques, tend to achieve at higher reading levels (Chetty et al., 2011; Landry et al., 2009; McCutchen et al., 2002; Moats & Foorman, 2003). There is, however, a continued discrepancy between educators' stated beliefs and knowledge about early reading instruction and what research demonstrates is effective early reading instruction (Bos et al., 2001; Landry et al., 2009; Spear-Swerling et al., 2005).

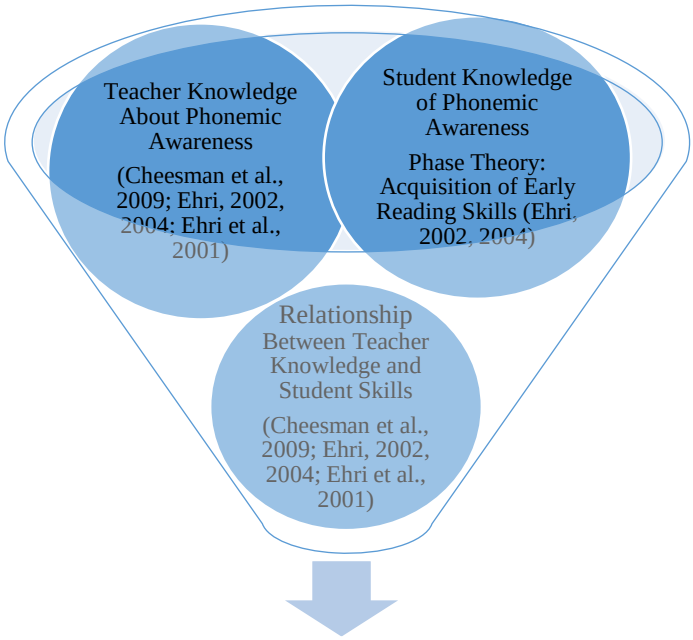
Bos et al. (2001) indicate teachers reported themselves as partially prepared to instruct students in reading (Spear-Swerling et al., 2005). Cheesman et al. (2009) suggest 87% of first-year teachers reported having at least an introduction to phonemic awareness instruction. If teachers are ill prepared to provide quality phonemic awareness instruction, the burden then falls to local school districts to provide the additional professional development required (Cheesman et al., 2009).

**Theoretical Framework**

Language development in children as a research field contains a wide range of theoretical views (Clibbens, 1993; Ehri et al., 2001; Gredler, 2012; Mosenthal, 2001; Shuy, 2001). This research is based on two bodies of knowledge. One concerns teachers' knowledge about the specific skill set of phonemic awareness contained within the larger category of phonological awareness. The other body of research references phonemic awareness acquisition correlated to student achievement in early literacy skills. Figure 1 represents the theoretical framework used in this study.

Figure 1

*Theoretical Framework*




1. What is the relationship between kindergarten teacher knowledge of phonemic awareness and developing phonemic awareness skills in kindergarten students as measured by the Survey of Teacher PhAKS and the Dynamic Indicators of Basic Early Literacy Skills (DIBELS Next Edition) Assessment?

2. What is the relationship between kindergarten teacher knowledge of phonemic awareness as measured by the Survey of Teacher PhAKS (Phonemic Awareness, Knowledge, and Skills) and years of teaching and type of degree held by the teacher?

*Figure 1.* Visual representation of the theoretical framework utilized in this study. Created by the researcher, D. Harris, 2016. Theoretical framework included three areas: (a) teacher knowledge of phonemic awareness (Cheesman et al., 2009; Ehri, 2002, 2004; Ehri et al., 2001); (b) Phase Theory (Ehri, 2002, 2004); and the relationship between teacher knowledge and student skills (Cheesman et al., 2009; Ehri, 2002, 2004; Ehri et al., 2001).

Much discussion has taken place over the years regarding whether the relationship between phonemic awareness and early literacy skills is a causal or reciprocal relationship (Bell, 2010; Ehri et al., 2001; McCutchen et al., 2002; Mann & Foy, 2003; Stanovich, 1986). The argument that phonemic awareness improves literacy while literacy development in other areas also improves phonemic awareness, commonly referred to as the Matthew effect (Stanovich, 1986). As students develop in their reading skills, they read more. As students read more, they further develop their skills (Stanovich, 1986). Ehri (1986) also suggests a possible reciprocal relationship between phonemic segmentation and reading. Knowing how to segment words into phonemes may help students learn to read more effectively while learning the alphabetic system in reading may also strengthen phonemic skills (Ehri, 1987).

Phase Theory defines four phases of reading development: the pre-alphabetic phase, the partial alphabetic phase, the full alphabetic phase, and the consolidated alphabetic phase (Ehri, 2002; Gaskins, Ehri, Cress, O'Hara, & Donnelly, 1997). The concept of literacy being acquired by children in phases is widely accepted (Beech, 2005). Ehri introduced flexibility into her phases that compromise Phase Theory (Beech, 2005). Ehri's Phase Theory will remain useful to researchers for some time because it is a flexible framework to explain reading development in children rather than a set of hypotheses (Beech, 2005). Phase Theory helps educators realize student expectations for reading may be unrealistic if they have not progressed through the prior phases of learning (Gaskins et al., 1997).

The first phase, the *pre-alphabetic phase*, occurs before any alphabetic knowledge and does not include any letter-to-sound associations. Connections are formulated using visual features called cues (Ehri, 2002; Gaskins et al., 1997).

In the next phase, the *partial alphabetic phase*, children utilize a blend of reading some letters in words and then attempt pronunciation. The first and last letters in a word are typically the most critical during this phase (Ehri, 2002; Gaskins et al., 1997).

Ehri's third phase is the *full alphabetic phase*. Developing readers can form alphabetic connections and use the letter to sound associations in sight words (Ehri, 2002). Letter-sound connections begin to solidify in memory during this phase (Gaskins et al., 1997).

The fourth phase in Phase Theory is identified as the *consolidated alphabetic phase*. In this final phase, readers repeated letter patterns become consolidated in memory (Ehri, 2002). A word such as "sing" would be very difficult if a child had not successfully progressed through the use of visual cues in the pre-alphabetic phase or letter-sound connections in the partial alphabetic phase (Gaskins et al., 1997). Figure 2 visually illustrates the Phase.

Figure 2

*Phase Theory*

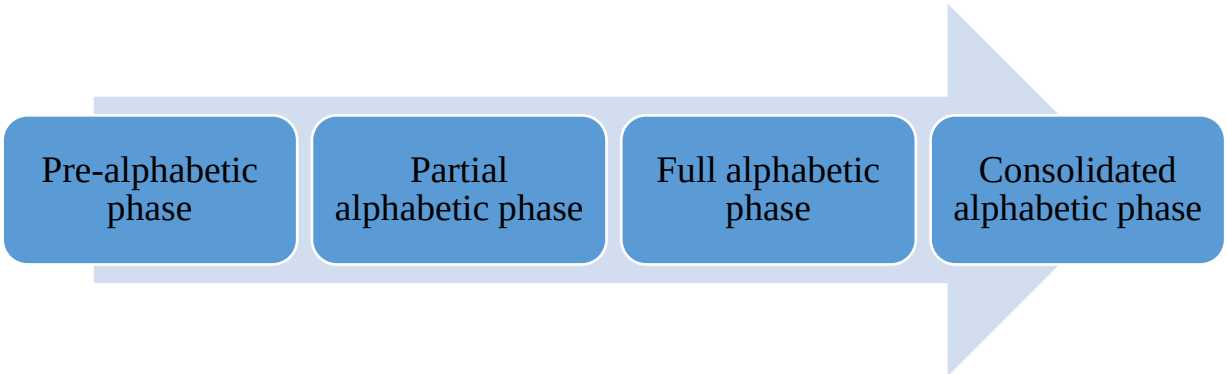



*Figure 2.* Visual representation of the stages of development within Phase Theory (Ehri, 2002, 2004; Gaskins et al., 1997).

Phase Theory explains the progression of skills children experience during reading acquisition. Teacher knowledge regarding phonemic awareness may have a correlating impact on student achievement (Bos et al., 2001; Cheesman et al., 2009; Landry et al., 2009; McCutchen et al., 2002; Moats, 2011; Spear-Swerling et al., 2005; Vesay & Gischlar, 2013). As a result, this study seeks to answer several related research questions.

**Research Questions**

Creswell (2014) described five ways to assess research questions by answering whether the proposed study does the following: (a) fills a void in the literature; (b) replicates a past study, but with different participants; (c) extends past research; (d) gives voice to groups of people in society usually unheard; or (e) informs current practice. The outcomes of this study add to the current literature regarding the relationship between teacher knowledge of phonemic awareness and developing phonemic awareness skills in kindergarten students. The following research questions are posed:

1. What is the relationship between kindergarten teacher knowledge of phonemic awareness and developing phonemic awareness skills in kindergarten students as measured by the Survey of Teacher PhAKS (Phonemic Awareness, Knowledge, and Skills) and the Dynamic Indicators of Basic Early Literacy Skills (DIBELS Next Edition) Assessment?
2. What is the relationship between kindergarten teacher knowledge of phonemic awareness as measured by the Survey of Teacher PhAKS (Phonemic Awareness, Knowledge, and Skills) and years of teaching and type of degree held by the teacher?

**Description of Terms**

Many of the terms used in association with reading development are defined differently by various researchers, therefore, it important to create a common understanding of the terms used in this study (Walsh, 2009). The following is a current list of terms used in this study.

**Alphabetic principle.** The understanding that letters and letter patterns represent sounds and sound patterns which exist in spoken language and that they link in a somewhat predictable way (Walsh, 2009).

**Basic early literacy skills.** Predictive skills for reading acquisition and future reading achievement (Kaminski & Good III, 2012).

**Effortful control.** The regulation of one's behavior in relation to current and future needs such as waiting for a better reward (Rueda, Posner, & Rothbart, 2005).

**Epilinguistic awareness**. A global sensitivity to similarities in speech sounds (Carroll, Snowling, & Hulme, 2003).

**Executive function**. A set of abilities necessary to guide behavior toward a goal (Banich, 2009). Executive function includes attention, inhibition, working memory, and cognitive flexibility (Cartwright, 2012).

**Graphemes.** The units of written language representing the phonemes used in spelling (Armbruster & Osborn, 2004; National Reading Panel, 2000).

**Inhibitory control.** The suppression of the desired response to achieve a goal (Foy & Mann, 2013).

**Metalinguistic awareness.** Awareness at the conscious level of the phonological segments, which are normally phonemes, within a word (Carroll et al., 2003; Walsh, 2009).

**Morpheme.** A morpheme is the most basic element of reading and the smallest meaningful unit of grammar in a language (Lyster, 2002). The word “dogs” has two morphemes (root word dog) and (plural s).

**Morphological awareness.** The ability to be aware of and manipulate morphemes (Lyster, 2002).

**Onset-Rime.** The onset is the part of the word before the vowel. The “b” in the word bat. The rime is the vowel and rest of the word so the “at” in the word bat (University of Oregon Teaching Center, 2009).

**Phonemes.** The smallest sound pieces in words (Phillips et al., 2008). The English language is made up of about 41 phonemes which combine to form syllables and words. (Armbruster & Osborn, 2004; National Reading Panel, 2000).

**Phonics.** An instructional approach matching sounds to letters in words in order to encode or decode words (Walsh, 2009).

**Phonemic awareness.** The ability to identify and manipulate the smallest sound pieces in words, the phonemes (Phillips et al., 2008).

**Phonological awareness.** An awareness of the sound structures that make up spoken language (Kerins, 2006; Lyster, 2002; Schuele & Boudreau, 2008).

**Phonological memory.** How phonological information is coded or entered into working memory before being stored into long term memory (Kerins, 2006).

**Phonological processing.** The group of skills pertaining to an individual’s understanding that words contain sounds or phonemes and an individual’s ability to use those sounds as linguistic building blocks (Hurford et al. 1994; McGuiness, McGuinness, & Donohue, 1995).

**Preschool.** Early learning programs for children ranging between three and five years of age before starting formal public schooling (Callaghan & Madelaine, 2012).

**Self-regulation.** The integration of emotion and cognition (Blair & Razza, 2007)**.**

**Working memory.** The active maintenance and manipulation of information (Foy & Mann, 2013). It can also be defined as the holding of information in mind, updating it and then performing some operation on it (Willoughby, Kupersmidt, & Voegler-Lee, 2012).

## Potential Significance of the Study

The goal is clear to educators: All children should be proficient readers by third grade (US Department of Education, 2014). A critical prerequisite for learning to read proficiently includes phonemic awareness (Cheesman et al., 2009; Ehri et al., 2001; Mann & Foy, 2003; Lyster, 2002; National Reading Panel, 2000; Vandervelden & Siegel, 1995). Without phonemic awareness proficiency, children will not be able to reach the critical goal of reading proficiency (Anthony & Francis, 2005; Bingham & Patton-Terry, 2013; Bos et al., 2001; Catts et al., 2001; Ehri et al., 2001; Engen & Hoien, 2002; Mann & Foy, 2003; Hurford et al., 1994; Hutchinson, Kirby, & Carson, 2000; Kerins, 2006; Lundberg et al., 2012; McGuinness et al., 1995; Ouellette & Haley, 2013; Stanovich, 2008; Vandervelden & Siegel, 1995; Walsh, 2009).

Kuhl (2011) points out the opportunity to impact a student's learning earlier than previously thought, yet the US Department of Education (2014) cites low enrollment in preschools across the nation. With support of President Obama's Preschool for All Program, publicly funded preschool education could be available for all children in the nation (US Department of Education, 2014). According to Phillips et al. (2008), many early childhood educators, especially preschool educators, lack general knowledge of phonological awareness and how to instruct young children in phonemic awareness. The implication of one-fifth of

children not meeting developmentally-appropriate phonemic awareness goals by the midpoint of first grade is alarming (International Reading Association, 1998).

Years of research affirm the critical importance of phonemic awareness; however current research lacks evidence of teacher knowledge regarding phonemic awareness and its relationship to student performance. Also lacking is a clearly defined relationship between teacher knowledge of phonemic awareness and how educators obtain that knowledge through experience or educational teacher preparation program. This study addresses phonemic awareness and factors influencing its acquisition at the kindergarten level.

**Overview of Research Methods**

This quantitative study examined two fundamental components of kindergarten reading education: kindergarten teacher knowledge and kindergarten student achievement. This study investigated whether there is a relationship between kindergarten teacher knowledge of phonemic awareness and development of phonemic awareness skills in kindergarten students. Secondly, this study examined the relationship between kindergarten teacher knowledge of phonemic awareness, years of teaching, and type of degree held by the teacher.

A validated teacher survey was employed to gather demographic data on educators, as well as their knowledge about phonemic awareness: the Survey of Teacher PhAKS (Phonemic Awareness, Knowledge, and Skills) created by Elaine Cheesman (2009). It was administered to kindergarten teachers in a large suburban school district.

Ex post facto data from the fall and winter kindergarten first sound fluency portion of the Dynamic Indicators of Basic Early Literacy Skills (DIBELS Next Edition) Assessment was collected from classes from 21 elementary schools in the same large suburban school district. The first sound fluency portion of the Dynamic Indicators of Basic Early Literacy Skills

(DIBELS Next Edition) Assessment is a short, direct measure of a child's fluency in identifying the beginning sounds in words (Kaminski & Good, 2011).

The role of phonemic awareness, teacher knowledge of phonemic awareness, reading readiness, and the role of executive function of the brain will be explored in the Chapter 2 literature review. Each topic will be discussed along with its connection to the early reading development in young children. The literature review will provide an in-depth examination of the past and recent research regarding early reading acquisition.

# Chapter 2

## Review of Literature

### Introduction

This literature review provides a greater understanding of the role phonemic awareness plays in the development of early reading skills. It examines the following topics: (a) the role of phonemic awareness as a critical element in phonological awareness; (b) the role of teacher knowledge and beliefs about phonemic awareness; (c) reading readiness skills and their impact on early reading development; and (d) the role of executive function of the brain and its impact on phonemic awareness development. Figure 3 provides an overview of the literature reviewed for this study.

Figure 3

*Categories of the Literature Review*

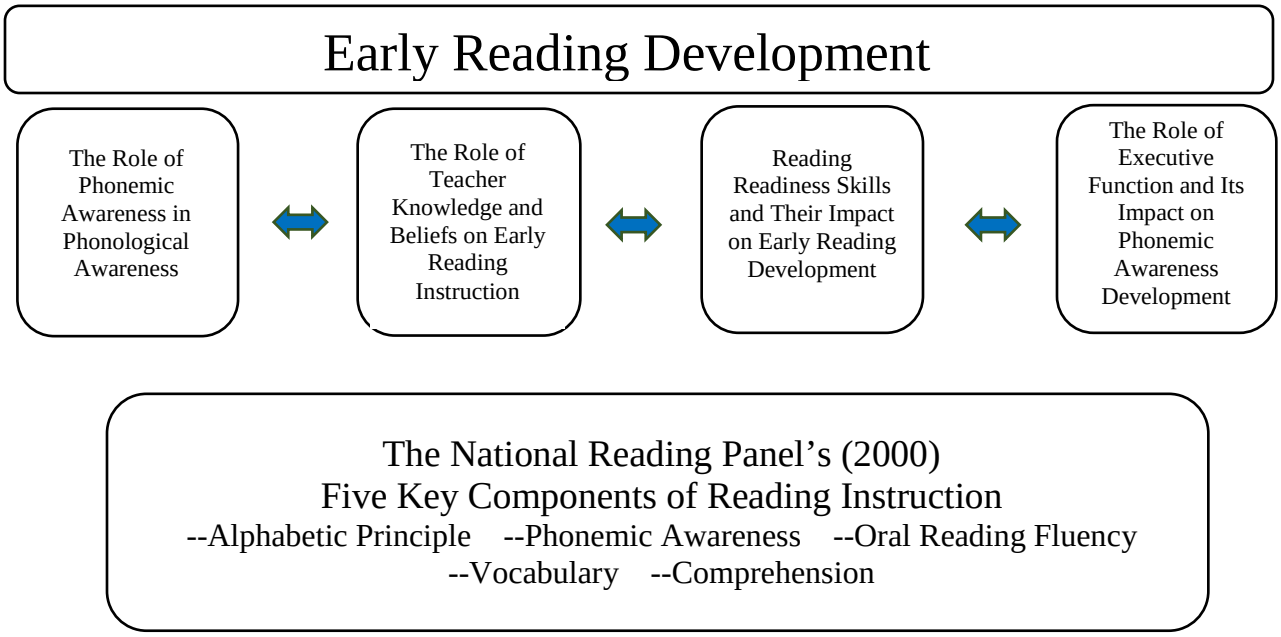



*Figure 3.* Areas of early reading development explored as part of the literature review. Created by the researcher, D. Harris, 2016.

Education in the United States is always in the midst of reform. Within these vast efforts exists reading and with it a promise to the American people to “leave no child behind,” otherwise known as the No Child Left Behind (NCLB) Act (2001). On December 10, 2015, President Obama signed The Every Student Succeeds Act (ESSA) which reauthorizes the 50-year-old Elementary and Secondary Education Act (ESEA) (US Department of Education, 2015). These laws represent longstanding commitments to equal educational opportunities for each child. Reform goals include assuring that 60% of students meeting reading proficiency continue to progress while the remaining 40% of students who are below standard, catch-up and make annual growth (Fielding et al., 2007). Struggling readers generally enter kindergarten behind their peers and continue to perform below grade level throughout elementary school, remaining behind their peers in middle and high school (Fielding et al., 2007; Torgeson, 2000).

The amount of reading research conducted suggests reading instruction is complex (Bingham & Patton-Terry, 2013; Carroll et al., 2003; Cartwright, 2012; Ehri et al., 2001; National Reading Panel, 2000; Norman & Malicky, 1999; Ouellette & Haley, 2013; Phillips et al., 2008; Pufpaff, 2009; Reading & Van Deuren, 2007; Schuele & Boudreau, 2008; Vandervelden & Siegel, 1995; Walsh, 2009). Children enter kindergarten with varying levels of reading development. Learning to read requires a combination of many skills, including alphabetic principle, phonemic awareness, oral reading fluency, vocabulary, and comprehension (Cheesman et al., 2009; Kerins, 2006; National Reading Panel, 2000; Ouellette & Haley, 2013; Torppa et al., 2007; Vesay & Gischlar, 2013).

**Theoretical Framework**

One hundred research studies from 2006 journal issues were reviewed by Koro-Ljungberg, Yendol-Hoppey, Smith, and Hayes S. B., (2009) to understand the use of theoretical

frameworks in a variety of contexts. The theoretical viewpoint of each study was identified and only one-quarter of the articles referred to a theoretical perspective (Koro-Ljungberg et al., 2009). In six of the twenty-four articles containing a theory, the authors used the terminology of theoretical framework or conceptual framework (Koro-Ljungberg et al., 2009).

The theoretical perspective is not always addressed adequately in the research process which leads to ambiguity (Koro-Ljungberg et al., 2009). Researchers who provide clear and transparent descriptions of the values and beliefs that shaped their decision making help scaffold the learning contained in the research for the readers (Koro-Ljungberg et al., 2009). The theoretical framework used in this study refers to the phases children pass through when developing reading proficiency.

As children acquire reading skills, they pass through developmental phases (Ehri, 2002, 2004; Gaskins et al., 1997). The phases make up Phase Theory (Boyer & Ehri, 2011; Ehri, 2002, 2004; Gaskins et al., 1997). The phases are named the pre-alphabetic phase, the partial alphabetic phase, the full alphabetic phase, and the consolidated alphabetic phase (Boyer & Ehri, 2011; Ehri, 2002, 2004; Gaskins et al., 1997).

Children read words by using visual cues in the *pre-alphabetic phase*. Words are remembered by the visual context associated with the word. The visual representation may be a picture related to the word or the shape of the word itself. Environmental print is associated with this developmental phase including familiar restaurant signs or a stop sign. Research with preschool-age children found even with changing a letter, student read words associated with signs by memory based on the visual cues of shape and colors (Boyer & Ehri, 2011; Ehri, 2002, 2004). In this phase, words are associated with actions. An example would be when a young child associates the word “Crest” with the context of brushing teeth (Ehri, 2002, 2004). Young

children utilize visual cues because they have not developed letter-sound connections (Ehri, 2002, 2004).

As children progress to the *partial alphabetic phase*, early readers start to acquire letter knowledge (Boyer & Ehri, 2011; Ehri, 2004; Gaskins et al., 1997). Learning to write their name was a strong predictor of future reading skills in children (Ehri, 2004). Letters provide concrete phoneme representations that disappear as soon as they are heard (Boyer & Ehri, 2011).

Once there are no longer enough visual cues to support a child's reading; they move to a combination of cues and letter knowledge (Ehri, 2004). Children in the *partial alphabetic phase* demonstrate quick growth in their sight vocabulary (Ehri, 2004). Reading using either visual cues or partial phonetic cues is insufficient for reading success (Gaskins et al., 1997). Relying only on visual cues burdens a child's memory while phonetic cues also do not always work (Gaskins et al., 1997). Students often misread similar words such as balloon and button because they are relying on the first and last letter sound while ignoring the letters in between (Gaskins et al., 1997).

In the *full alphabetic phase*, make connections between letters and sounds. The sound-symbol relationship retained in memory can be triggered when needed for reading (Gaskins et al., 1997). Learning to read requires recognizing words from memory through connections between letters and phonemes (Boyer & Ehri, 2011). Phonemic awareness is necessary to read words from memory while also identifying phonemes in unfamiliar spoken words (Boyer & Ehri, 2011).

The *consolidated alphabetic phase* leads to further efficiency in reading. Students have mastered the sound-symbol relationships and chunk consistent letter groups such as –ing, -ment,

and –tion (Gaskins et al., 1997). Decoding words becomes easier with consolidated letter units (Gaskins et al., 1997).

Early language acquisition, phonemic awareness skill development, and teacher professional development each play a critical role in a child's ability to learn to read (McCutchen et al., 2002). This chapter's literature review considers how Phase Theory, describing phonemic awareness skill development for kindergarten students, and teacher knowledge of phonemic awareness are interrelated to form a theoretical framework for this study.

**The Role of Phonemic Awareness as a Critical Element in Phonological Awareness**

There is an immense body of research which has been conducted over the last 50 years related to the development of early reading skills (Alcock et al., 2010; Bingham & Patton-Terry, 2013; Carroll et al., 2003; Ehri et al., 2001; Hatcher, Hulme, & Ellis, 1994; Norman & Malicky, 1999; Ouellette & Haley, 2013; Phillips et al., 2008; Reading & Van Deuren, 2007; Schuele & Boudreau, 2008; Vandervelden & Siegel, 1995; Walsh, 2009; Welsh et al., 2010).

Phonological awareness, as a causal factor in reading development, is a controversial topic (Aaron, 2003; Anthony & Lonigan, 2004; Cuevas, Hubble, & Bell, 2012; Norman & Malicky, 1999; Walsh, 2009). The amount of reading research is substantial, so beliefs and practices must constantly be updated and revised (Aaron, 2003). Researchers and educators have focused with increasing urgency over the past decade on teaching all students to read well (Torgeson, 2000). Specific skills may be more critical than others such as letter naming or sounding out words (Foy & Mann, 2003).

The terms phonological awareness and phonemic awareness are often used interchangeably (National Institute of Child Health and Human Development, 2014; Pufpaff, 2009; Walsh, 2009). Phonological awareness is the broader concept with phonemic awareness as

a part (Ouellette & Haley, 2013; Shanahan, 2006). Phonological awareness is the sensitivity to the sound structure of words including syllables and rhyme (Shanahan, 2006).The lack of a clear definition of phonemic awareness argues Walsh (2009), contributes to the ongoing debate among researchers. However, phonological awareness is best defined as the ability to analyze the sound structure of words, while phonemic awareness is the ability to isolate the specific phonemes or sounds (Alcock et al., 2010; Lyster, 2002; McGuinness et al., 1995; Norman & Malicky, 1999; Ouellette & Haley, 2013; Pufpaff, 2009; Shanahan, 2006; Walsh, 2009). In its purest form, phonological awareness does not involve print (Schuele & Boudreau, 2008). Phonological awareness tasks require children to analyze, make judgments about, and manipulate the sounds in spoken words (Alcock et al., 2010; Ouellette & Haley, 2013; Pufpaff, 2009; Schuele & Boudreau, 2008; Shanahan, 2006). Phonological awareness develops quickly once literacy instruction begins by learning the names and sounds of the associated letters (Anthony & Francis, 2005; Ouellette & Haley, 2013).

Children utilize and process large amounts of phonological information in speaking and listening without conscious effort (Walsh, 2009). Even before being able to count or stand on one leg, young children are quite competent at using their native language (Chater & Christiansen, 2010). Mosenthal (2001) explored language and thinking, arguing thinking is not observable and, contrary to what some researchers assume, speaking and thinking are not the same process. Linguists refer to speaking as grammar or the categorizing of nouns, verbs, and adjectives (Mosenthal, 2001). According to Mosenthal (2001), linguists do not agree on what the categories and their relationships to language mean. Some linguists make the argument that these relationships are syntactic while others claim they are semantic (Mosenthal, 2001). Vygotsky (1962), an early theorist, proposed that speaking and thinking develop as parallel processes and

then become related when words, parts of the speaking system, are associated with concepts, part of the thinking system (Mosenthal, 2001). Whorf (1956) believed that words and language structures influence how a speaker views the world (Mosenthal, 2001). He explains this by presenting how different languages have a variety of words for the same concept (Mosenthal, 2001).

The last decade had brought about advances in neuroscience research regarding language acquisition (Kuhl, 2010). Using neural signatures of the brain, scientists can measure brain responses to phonetic stimuli (Kuhl, 2010). Linguistic development can be measured starting in infants and through the pre-reading stages of preschool age children (Kuhl, 2010). According to Kuhl (2010), the neural evidence demonstrates the need for the learning of phonetic structures within a social context. Kuhl (2010) argues these recent findings do not support Skinner's or Chomsky's theories. Evidence shows an infant's learning of language is complex and multi-modal, developing as a result of faces, actions, and voices of other people in their lives (Kuhl, 2010).

The world's languages are made up of approximately 40 distinct elements called phonemes that alter a word's meaning such as *rat* to *bat* in English (Kuhl, 2010). In the first year of life, an infant must sort through all the sounds available to discover the specific sounds associated with their native language (Kuhl, 2010). If students can distinguish between the 40 phonemes, then these students have already accomplished steps toward becoming literate before being introduced to the written form of the language (Anthony, 2003).

Roth, Speece, & Cooper (2002) suggest there is evidence that supports three domains of oral language development related to reading ability: structural language, metasemantics, and narrative discourse. Structural language includes the ability to gain meaning from printed words

and then use sentence structure to predict the grammatical order and form or words (Roth et al., 2002). According to Roth et al. (2002), metasemantics includes the ability manipulate the meaning of words, phrases, and sentences including nonliteral forms such as idioms. Narrative discourse is believed to be the transition between oral language and literacy (Roth et al., 2002). Roth et al. (2002) postulate that oral language and reading are subject to both qualitative and quantitative change as they develop. While one skill may play an important role early on, others may exert more influence over time. Roth et al. (2002) suggest this is true in each of the framework domains.

The relationship between thoughts and words has been questioned for centuries (Wells & Wells, 2001). More importantly, is the way in which two individuals understand and make meaning of speech interactions (Wells & Wells, 2001). In the research conducted by Wells and Wells (2001), a strong correlation was found between pre-school language development and future success in school. Language is learned by children as they interact with others in a variety of activities (Wells & Wells, 2001). Children then take these interactions and incorporate the feedback into their developing language skills (Wells & Wells, 2001).

Metalinguistic refers to the awareness of language as a thing, and its development begins with spoken language (Callaghan & Madelaine, 2012; Walsh, 2009). Because phonemic awareness is a metacognitive and metalinguistic skill, it is believed by some researchers that young children are unable to use the skill (Bell, 2010). Phonemic awareness is neither natural nor spontaneous in young children (Bell, 2010). It could be hypothesized that phonological awareness might be contingent on vocabulary development and as vocabulary grows it is organized by the learner in phonological representations (Carroll et al., 2003; Engen & Hoien,

2012). Strong phonological awareness may also strengthen reading confidence that is an important factor in reading comprehension (Engen & Hoien, 2012).

In addition to strengthening reading confidence, it is apparent that young children need a certain level of phonological awareness to become proficient in reading (Alcock et al., 2010; Anthony & Francis, 2005; Bingham & Patton-Terry, 2013; Bos et al., 2001; Catts et al., 2001; Ehri et al., 2001; Engen & Hoien, 2002; Foy & Mann, 2003; Hurford et al., 1994; Hutchinson et al., 2000; Kerins, 2006; Lundberg et al., 2012; McGuinness et al., 1995; Ouellette & Haley, 2013; Stanovich, 1986, 2008; Vandervelden & Siegel, 1995; Walsh, 2009).

There are differing views on how children develop phonological awareness skills (Alcock et al., 2010; Carroll et al., 2003; Ehri et al., 2001; Foulin, 2005; Foy & Mann, 2003; Hutchinson et al., 2000; Nithart, Demont, & Metz-Lutz, 2011; Nyman, 2013; Pufpaff, 2009; Puolakanaho, Poikkeus, Ahonen, Tolvanen and Lyytinen, 2003; Shanahan, 2006). In fact, there exists significant controversy about the nature of phonological development (Alcock et al., 2010; Anthony & Lonigan, 2004; Ehri et al., 2001; Engen & Hoien, 2002; Hutchinson et al., 2000).

A theoretical view held by many researchers is that phonological awareness progresses through a developmental sequence from an awareness of words as units of speech followed by awareness of syllables, onset rime units, and then phonemes (Carroll et al., 2003; Ehri et al., 2001; Puolakanaho et al., 2003; Vloedgraven & Verhoeven, 2007). Phonological skills are a part of normal language development and seen even in non-alphabetic languages (Shanahan, 2006). Anthony and Francis (2005) argue that a definition of phonological awareness has emerged from the research along with a sequence of phonological development that is universal across languages. The relationship between phonological awareness and reading has been supported by four decades of research and is apparent in all alphabetic languages (Anthony & Francis, 2005).

An understanding that printed letters represent speech phonemes and associating them with learning to read and spell is essential for children (Alcock et al., 2010; Manolitis &Tafa, 2011; Moats & Foorman, 2003). Phonological awareness is directly associated with both letter-sound and letter-name knowledge (Alcock et al., 2010; Manolitis & Tafa, 2011; Moats & Foorman, 2003). Current viewpoints, held by researchers on phonological awareness, can be placed on a continuum from general to specific as seen in Figure 4.

Figure 4

*Continuum of Phonological Awareness Skills*

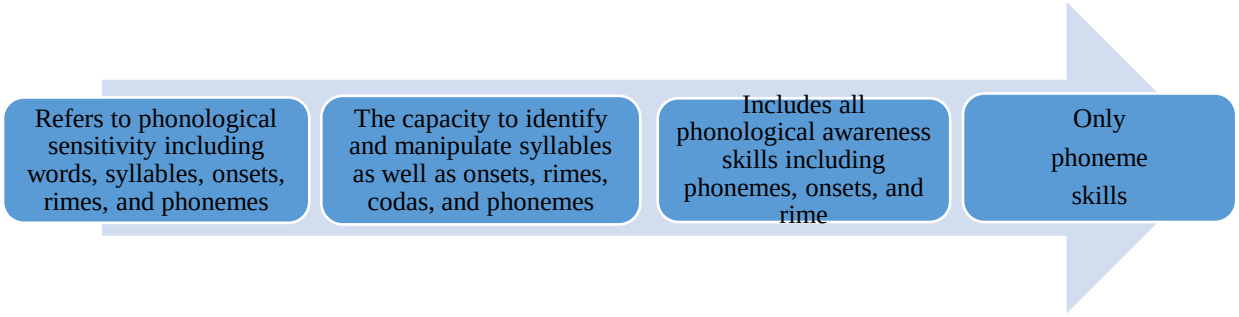



*Figure 4.* Graphic representation of the continuum of phonological awareness skills (Alcock et al., 2010; Ehri et al., 2001; Ouellette & Haley, 2013; Phillips et al., 2008; Shanahan, 2007; Vloedgraven & Verhoeven, 2007).

A component of phonological awareness is phonemic awareness, which is the ability to recognize and segment the phonemes which comprise spoken language (Anthony & Francis, 2005; Carlson et al., 2013; Ehri et al., 2001; National Reading Panel, 2000; Ouellette & Haley, 2013; Torppa et al., 2007; Vandervelden & Siegel, 1995; Walton, Walton, & Fenton, 2001). Phonemic awareness is a critical subset of skills included in the larger category of phonological awareness and the processing ability most closely related to early literacy acquisition (Anthony & Francis, 2005).

Phonemic awareness is a basic early literacy skill which is a predictor of reading acquisition and future reading success (Carlson et al., 2013; Kaminski & Good III, 2012; Mann

& Foy, 2003; Ouellette & Haley, 2013). Two of the best predictors of reading acquisition during the first two years of school are phonemic awareness and letter knowledge as evidenced by correlational studies (National Reading Panel, 2010).

Phonemic awareness refers specifically to the identification of individual sounds in words (Armbruster & Osborn, 2004; Ehri et al., 2001; Kaminski & Good, 2011; Kerins, 2006; National Reading Panel, 2000; Ouellette & Haley, 2013; Reading & Van Deuren, 2007; Torppa et al., 2007; Walsh, 2009). Phonemic awareness includes the ability to manipulate individual phonemes in words, along with oral rhyme, alliteration, syllables, onsets, and rimes (Reading First in America, 2010).

Interconnected with the development of speech sounds in young children is the development of specific phonemes which become the building blocks of words (Lyster, 2002; McGuinness et al., 1995; Norman & Malicky, 1999; Pufpaff, 2009; Shanahan, 2006; Walsh, 2009). For example, the word bat had three phonemes or sounds: /b/ /a/ /t/. The word rake also has three phonemes: /r/ /a/ /k/. Phonemic awareness is the awareness of sounds, not letters. Even though “rake” has four letters, you only hear three phoneme or sounds when the word is spoken. Phonemic awareness complexity is indicated by the number of phonemes in a word; the greater the number of phonemes, the higher the complexity (Bell, 2010).

Phoneme segmentation is the ability to divide a word into its sounds while phoneme synthesis is the ability to blend sounds together to make a syllable or word (Ouellette & Haley, 2013). Shanahan (2006) points out that breaking words up into individual sounds is an easy task for adults; however it is very difficult for young children. Dividing words into their phonemes is difficult for children below the age of five or six because there are no clear boundaries in speech and the sounds tend to overlap (Ehri, 1986). The ability of young children hear the individual

sounds within words varies which led Stanovich (1986) to hypothesize about the importance of phonemic awareness in early reading development.

According to Nyman (2013) and Pullen and Justice (2003), oral language development should not be overlooked as an important precursor to reading. Oral language plays a significant role in phonological awareness development (Anthony & Francis, 2005; Bell, 2010). Oral language strength does not guarantee strong reading, just as poor reading skills do not always lead to low reading ability (Bell, 2010). Support for oral language is viewed as a positive intervention for at-risk students in their literacy development (Bell, 2010).

Most children develop some level of phonemic awareness before formal reading instruction begins (Anthony & Francis, 2005). Ehri (1986) suggests a visual letter helps in the process of phonemic awareness and is part of reading instruction, not a precursor. Students taught to segment words into their phonemes with letters learned the skill better than those who did not have access to the visual letters (Ehri, 1986). Research supports teaching phonemic awareness after learning the alphabet; however this doesn't mean phonemic awareness can't be taught prior (Bell, 2010).

The nature of the oral language to reading connection is missing from the research (Roth et al., 2002). By clarifying oral language and reading connections, advances can be made in the theoretical constructs regarding these two domains (Roth et al., 2002). This work is critical for both early intervention and effective instruction for children, especially those who may be at-risk for reading problems (Roth et al., 2002).

There is a body of evidence indicating phonemic awareness is a critical skill in reading development (Armbruster & Osborn, 2004; Bingham & Patton-Terry 2013; Carroll et al., 2003; Ehri et al., 2001; Kaminski & Good, 2012; Lundberg et al., 2012; McCutchen et al., 2002;

Ouellette & Haley, 2013; Reading & Van Deuren, 2007; Schuele & Boudreau, 2008; Torgeson, 2000; Vandervelden & Siegel, 1995; Walsh, 2009). The National Reading Panel (2000) and Ehri et al. (2001), cited evidence to support phonemic awareness and letter knowledge as two of the most reliable predictors of how well children will learn to read in their first two years of school.

Key findings from the National Institute of Child Health and Human Development (2003) and the National Reading Panel (2000) included phonemic awareness can be taught and learned and this explicit phonemic awareness instruction assists children in learning to read and spell. Research by the National Institute of Child Health and Human Development (2003) and National Reading Panel (2000) found phonemic awareness instruction is most successful when it focuses on only one or two types of phonemic manipulation including segmenting and blending which are critical skills. The most effective phonemic awareness instruction exists when children are progressively taught to manipulate phonemes by using alphabet letters (National Institute of Child Health and Human Development, 2003; National Reading Panel, 2000).

The strong relationship between reading development and the ability to reflect upon spoken language is widely accepted (Bell, 2010; Ehri et al., 2001; Engen & Hoien, 2002; Lyster, 2002; Mann & Foy, 2003; National Institute of Child Health and Human Development, 2014; Norman & Malicky, 1999; Walsh, 2009). Struggling readers first have difficulty understanding how words in oral language are represented in print and secondly, making the connections between the sounds in words and the letters representing them (Bell, 2010; Ehri et al., 2001; Mann & Foy, 2003; Shanahan, 2006; Torgeson, 2000). Phonemes provide readers with a strategy for decoding unknown words which help build vocabulary knowledge (Armbruster & Osborn, 2004; Mann & Foy, 2003; Vandervelden & Siegel, 1995).

A critical issue for researchers and practitioners is the understanding of how phonemic awareness develops (Carroll et al., 2003; Ehri et al., 2001; Engen & Hoien, 2002). Phillips et al., (2008), Pufpaff (2009), Vandervelden and Siegel (1995), and Walsh (2009) suggest that phonemic awareness has its own continuum of skills in early reading development. Initial consonants are acquired first for children, followed by final consonants, with medial vowels developing last (Puolakanaho et al., 2003; Vandervelden & Siegel 1995). Evidence demonstrates that rhyme awareness and phoneme awareness are separate skills (Carroll et al., 2003). Rhyme awareness appeared to correlate with short-term memory while phoneme awareness correlated with reading and letter knowledge (Foy & Mann, 2013). Figure 5 provides a visual description of this phonemic progression.

Figure 5

*Progression of Phonemic Development*

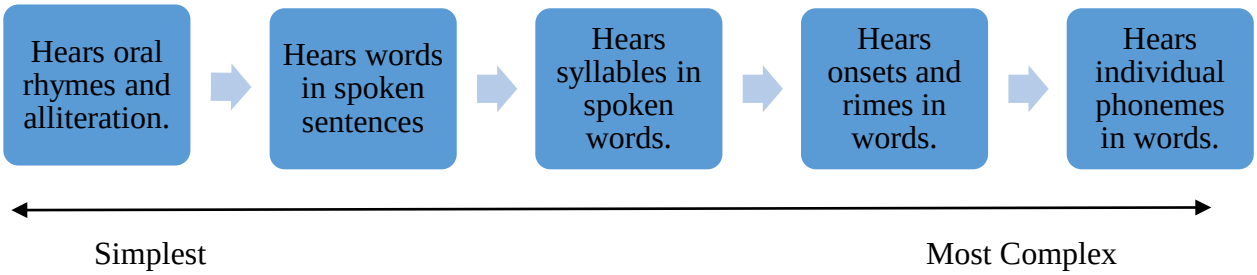



*Figure 5.* Visual representation of phonemic awareness development in children (Reading First in Virginia, 2010).

Due to the way oral language develops from simple speech sounds to syllables, there is nothing about the written alphabet that connects to what a native speaker would naturally do (McGuinness et al., 1995). Werker and Tees (1983) believe the phonemic level of development is lost to conscious awareness before a child enters formal schooling. For this reason, the common practice of starting with phonics as the basic building block of reading development is backward because it teaches the alphabet principle from print to sound (McGuinness et al.,

1995). Arguing that this makes the alphabet code entirely abstract, McGuinness et al. (1995), believe following this practice causes children never to learn where sounds originate. Bingham and Patton-Terry (2013) suggest that code based programs focusing on print come at the expense of oral language skills such as listening and speaking. According to Pullen & Justice, 2003, phonological awareness along with print awareness influences a child's later reading ability.

Phonemic awareness should not be confused with phonics (Shanahan, 2006). Phonics instruction refers to the letter-sound relationships that are then used to decode words (Shanahan, 2006). Phonemic awareness is not about how letters and sounds correspond or how to sound out letters to create words; it is hearing, thinking, and manipulating individual sounds within words (Kaminski & Good, 2012; Shanahan, 2006). The skills making up phonemic awareness include phoneme isolation, phoneme identity, phoneme categorization, phoneme blending, phoneme segmentation, and phoneme deletion (National Reading Panel, 2000).

In phoneme isolation, children must be able to recognize the individual sounds in words such as "What is the first sound in bat?" *(/b/)* Phoneme identity involves recognizing common sounds in several words. For example, "What is the sound you hear that is the same in boy, bug, bike?" *(/b/)* Phoneme categorization requires a student to hear the odd sound in a word list such as "Which word doesn't belong, cat, cut, rat?" (*rat*). When phoneme blending, children must listen to a sequence of sounds and then combine them to form a word. An example would be "What word is /c/ /a/ /t/?" (*cat*) Phoneme segmentation requires children breaking down a word into the sounds such as "How many sounds (phonemes) in bike?" *(Three: /b/ /i/ /k/).* Phoneme deletion is when a child removes a specific phoneme upon request. An example is "What is spark without the /s/?" (*park*) Even with growth in phoneme deletion tasks over time, it is still the most difficult task which demonstrates it may take longer to develop (Nithart et al., 2011).

**The Role of Teacher Knowledge of Phonemic Awareness in Early Reading Development**

In the past decade the knowledge about critical foundational reading skills including phonemic awareness development has increased immensely (Landry et al., 2009; McCutchen et al., 2002; Shanahan, 2006; Spear-Swerling et al., 2005). Gaps in teacher knowledge about reading instruction exist (Moats & Foorman, 2003). In a study by Moats and Foorman (2003), nearly 20% of teachers demonstrated very limited understanding of reading instruction that should be required for elementary certification. According to Nguyen (2004), there was a high discrepancy between teacher perception of the Big 5 ideas in reading (Alphabetic Principle, Phonemic Awareness, Oral Reading Fluency, Vocabulary and Comprehension) and actual implementation within the classroom in the strands of phonics, vocabulary, and fluency. Nguyen (2004) suggests reasons may include a need for professional development in the area of vocabulary and lack of instructional time for fluency each day.

Jaskolski (2013) concluded that even though research has shown phonological awareness is critical in reading development, it cannot be assumed that educators are well educated on the topic (McCutchen et al., 2002). Being a skilled reader adult reader does not guarantee a teacher is equipped with the knowledge necessary to instruct students in the complexities of phonology (McCutchen et al., 2002). In a study by Moats and Foorman (2003), each of the teacher participants demonstrated weak knowledge of phonological awareness. Early reading instruction and classroom practices are influenced by teacher knowledge of phonological awareness, which predicts student learning in kindergarten (Moats & Foorman, 2003).

It can be argued, according to Jaskolski (2013), that teachers need explicit instruction and practice in phonological awareness to confidently teach the skills in their classrooms

(McCutchen et al., 2002). Moats & Foorman (2003) found 28% of K-2 teachers mistakenly counted the phonemes in the word *sawed*. Phoneme matching was very difficult for teachers with 46% failing to recognize the /z/ phoneme ending the words *was* and *nose* (Moats & Foorman, 2003). It could be expected that teachers would have difficulty interpreting screening and diagnostic assessments needed to make instructional decisions (Moats & Foorman, 2003).

Each teacher needs oral language development strategies based on classroom observations (Rangel, 2013). Oral language proficiency is a prerequisite for reading instruction (Moats & Foorman, 2003). The how and why to modify lessons would be an important professional development piece because Rangel (2013) found teachers were modifying inappropriately at times, thus reducing the effectiveness of the lesson. Programs serving young children must be staffed with teachers who are well trained in phonological awareness along with early literacy instructional practices (Jaskolski, 2013).

While it can be argued that some curricular aspects enhance literacy success, a conclusion reached by researchers is that teaching ability is the major contributor to student success (Block, Oaker, & Hurt, 2002; Moats & Foorman, 2003). It is a reasonable conclusion that particular skills are required of teachers who serve students along a continuum of stages in their literacy development (Block et al. 2002). Research has demonstrated that teacher expertise has a significant role in students' literacy growth and effective teachers share similar characteristics (Block et al., 2002).

Researchers have identified five stages of development for highly skilled teachers including novice, advanced beginner, competent, proficient, and expert (Block et al., 2002). Teachers are in different stages of development as they gain various skills. The stages of teacher development are visually represented in Figure 6.

Figure 6

*Stages of Teacher Development*

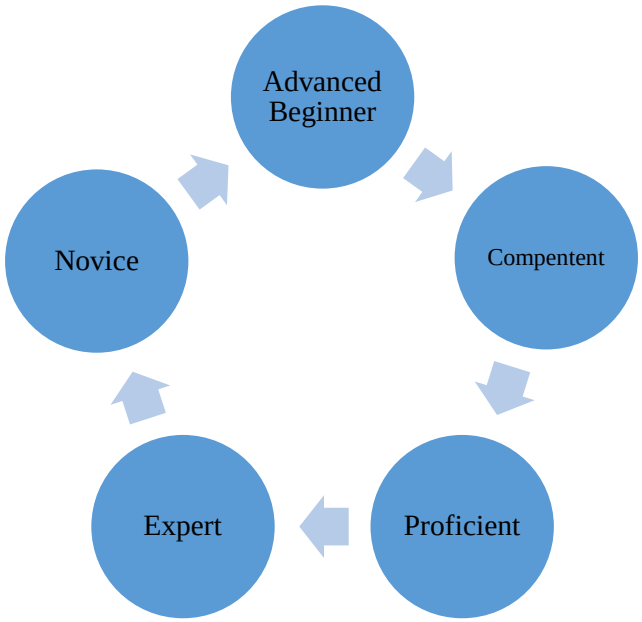



*Figure 6.* Graphic representation of the cycle of teacher development when implementing newly acquired instructional skills (Block et al., 2002).

The first stage in teacher development is the novice or beginner stage. Teachers in this stage use educational rules taught in their college classes. In the second stage, teachers become more advanced, yet remain beginners. In the second or third-year teaching includes the development of additional strategic knowledge. Teachers in this stage begin to break the global rules they were taught. Stage three is the competency stage. Researchers often agree that teachers in this stage prioritize, select sensible methods, and determine what is relevant to the skill (Block et al., 2002). In stage four, teachers become proficient as intuition increases. Teachers at this stage recognize the many similarities between content areas and skills. The expert teacher in stage five can be described as seamless. Teachers at this level know both content and student need intimately (Block et al., 2002).

Gallimore, Ermeling, Saunders, & Goldenberg (2009) utilized a framework for professional development that included four sections: (1) shared goals, (2) indicators of progress toward the goals, (3) assistance by others outside of the school setting, and (4) shared leadership that supported reaching the goal. According to Gallimore et al. (2009), teachers discovered they were not able to devote the time required to the process of improving instruction. Even the most dedicated teams were only able to spend about 77% of the allotted time actually improving instruction (Gallimore et al., 2009).

Another conceptual framework for explaining teacher learning and development within a community of learners is called the “Fostering a Community of Learners” (FCL) Program (Shulman & Shulman, 2004). The “Fostering a Community of Learners” (FCL) Program identified differences in teacher learning and considered conditions where teacher skills might change and develop (Shulman & Shulman, 2004). Five attribute clusters identified as cognitive, dispositional, motivational, performance, and reflective which contribute to effective teaching are included (Shulman & Shulman, 2004). Another layer is a model of teaching which includes both teaching and learning to teach within communities of teacher learners (Shulman & Shulman, 2004).

The elements of the theory proposed by Shulman and Shulman (2004) include ready, willing, able, reflective, and communal. Being ready includes having a vision of learning, while being willing refers to being motivated to teach (Shulman & Shulman, 2004). Being able refers to knowing the necessary concepts and being reflective is learning from experience about what works and doesn’t work (Shulman & Shulman, 2004). In another format, teacher development and teacher learning are explained by vision, motivation, understanding, practice, reflection, and community (Shulman & Shulman, 2004).

Desimone (2009) proposes studying a defined set of core features related to effective professional development described in a conceptual framework. Teachers experience activities and learning that increase their knowledge of teaching, and these may take both formal and informal formats (Desimone, 2009). Professional development can range from seminars and workshops to hallway discussions (Desimone, 2009). Based on research by others, Desimone (2009) formed a framework integrating of the characteristics of professional development for teachers that also increased student achievement. This framework includes (a) content focus, (b) active learning, (c) coherence, (d) duration, and (e) collective participation (Desimone, 2009).

The main problem with most teacher education programs is that they take place away from the actual teaching environment (Ball, Sleep, Boerst, & Bass, 2009). This format for teacher training leads to more focus on analysis rather than the performance of teaching skills (Ball et al., 2009). The first step in teacher improvement is to articulate the core tasks of teaching such as planning and discussions (Ball et al., 2009). Each of these core tasks should be broken down into teachable aspects that could be studied, taught, and rehearsed before being integrated back together (Ball et al., 2009). More work needs to be done to make teacher knowledge and teacher education stronger (Gallimore et al., 2009).

Ball et al., (2009) suggests a lack of support provided to educators. There is a lack of teaching pedagogy and structures for teacher learning in place which leaves teachers virtually on their own for improving practice (Ball et al., 2009). Teachers are partially responsible for developing student teachers, yet there is little opportunity for those teachers to improve their practice (Ball et al., 2009). Arguing this point, Dufour & Eaker (1998), state schools with Professional Learning Communities focus on the curriculum content and quality of connections

between staff and students. When educators connect with each other collectively, they accomplish much more than working individually (Dufour & Eaker 1998).

Teacher inquiry is not embedded as part of teacher improvement in the US educational system (Gallimore et al., 2009). According to Gallimore et al. (2009), it is important for teachers to work on educational problems long enough to solve them, but also to see the causal connections between their teaching and the learning. Making these connections is what leads to continuous improvement of instruction (Gallimore et al., 2009). Often, teacher improvement comes from trial and error followed by teacher self-reflection (Stigler & Thompson, 2009).

One view to improve reading is to hire teachers better prepared in reading instruction. Another view is to improve the performance of the teachers already in the classrooms Stigler & Thompson, 2009). A third approach and the one Stigler and Thompson (2009) propose, is to improve teacher methods regardless of experience or competence. Each approach to teacher improvement has merit, but striving for teaching advancement for all teachers over time leads to sustainable growth (Stigler & Thompson, 2009).

Rangel (2013) discovered that even in a small population of teachers, the knowledge and skills differ substantially. According to Desimone (2009), the success or failure of many educational reform efforts depends on the understanding of effective professional development for teachers. Innovations in teaching that help students learn better or faster can be replicated over time and then passed on to future generations of teachers (Stigler & Thompson, 2009). In many fields, innovations are frequent; however education in the United States remains slower to change (Stigler & Thompson, 2009). Teaching has become a cultural activity, according to Stigler and Thompson (2009), and cultural activities tend to be very resistant to the change process.

Nyman (2013) argues that educators should support learning standards by utilizing curricula that contain many opportunities for children to manipulate the language, expand their vocabulary, and be introduced to new words. Increasing vocabulary in children is more difficult for new teachers, so guidance and support with language development are important (Nyman, 2013). Peer support or mentor systems may help newer teachers while also helping young children build strong oral language skills (Nyman, 2013).

Parents and teachers may know the teaching of phonics; however, phonemic awareness as a distinct skill is a newer idea (McCutchen et al., 2002; Shanahan, 2006). Without a solid foundation in phonemic awareness, phonics skills are harder to learn for children (Shanahan, 2006). Creating high-quality instructional classroom environments for young learners requires special skills (Landry et al., 2009; McCutchen et al., 2002; Spear-Swerling et al., 2005). Pre-service teacher preparation programs may not be fully preparing teaching candidates in phonemic awareness instruction (Martinussen, Ferrari, Aitken, & Willows, 2015). Understanding the attributes of quality phonemic awareness instruction is critical to providing students with foundational early reading skills (Ehri et al., 2001; Landry et al., 2009; Spear-Swerling et al., 2005).

Intentional classroom instruction in phonological awareness is necessary for all preschool and kindergarten age children (Callaghan & Madelaine, 2012; Catts et al., 2001; Mann & Foy, 2003; Ehri et al., 2001; Lyster, 2002; National Reading Panel, 2000; Schuele & Boudreau, 2008). Intentional classroom instruction provides a foundation for early readers on which to build additional skills. Boyer and Ehri (2011) found preschool-age children demonstrated letter knowledge, but phonemic skills were limited or nonexistent. Evidence demonstrates students will vary in their acquisition of phonemic awareness skills by developing their phonemic

awareness skills at different rates (Catts et al., 2001; Ehri et al., 2001; Fielding et al., 2004; Lundberg et al., 2012; Lyster, 2002; National Reading Panel, 2000; Welsh et al., 2010). Teachers need to understand how phonemic awareness develops in children and which phonemic awareness tasks are easier or harder along with effective techniques (Carlson et al., 2013; Ehri et al., 2001; Vesay & Gischlar, 2013). Key to teaching phonemic awareness skills is the knowledge of common mistakes children make and how to effectively correct those errors (Ehri et al., 2001).

Figure 7 illustrates the components comprising phonemic awareness which must be intentionally taught to children (Catts et al., 2001; Callaghan & Madelaine, 2012; Lyster, 2002; National Reading Panel, 2000; Schuele & Boudreau 2008).

Figure 7

*Components of Awareness Framework*

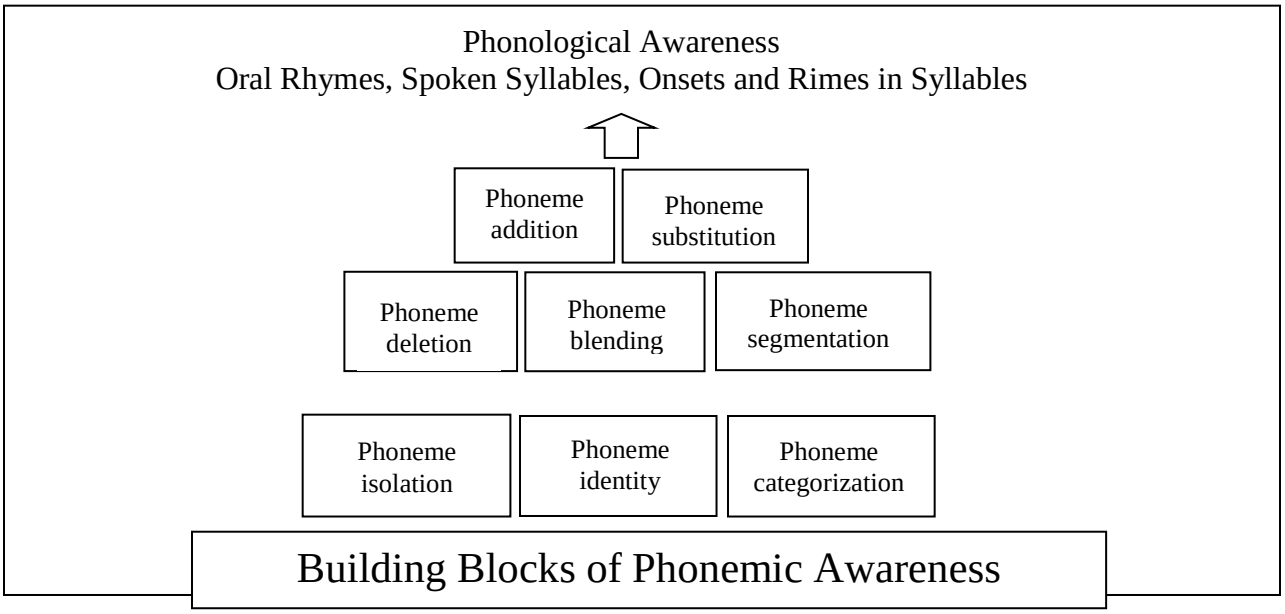



*Figure 7.* Visual representation of phonemic awareness components requiring explicit teaching for reading proficiency (Catts et al., 2001; Callaghan & Madelaine, 2012; Lyster, 2002; National Reading Panel, 2000; Schuele & Boudreau 2008).

Research data demonstrates intentional phonological awareness training does have a positive effect on the acquisition of early reading skills (Catts et al., 2001; Ehri et al., 2001; Fielding et al., 2004; Lundberg et al., 2012; Lyster, 2002; National Reading Panel, 2000; Ryder et al., 2008; Shanahan, 2006 Welsh et al., 2010). Callaghan and Madelaine (2012) argue early intervention and intentional instruction in phonemic awareness must take place at the preschool level or children will likely enter kindergarten with high variability in their early reading skills potentially leading to reading difficulties.

There is a large body of evidence demonstrating words learned earlier in life are recognized and produced faster than words learned later in life (Monaghan & Ellis, 2002). Carroll et al. (2003) argues a critical issue is understanding exactly how phonemic awareness originates during the preschool time period. Research conducted by Carroll et al. (2003) demonstrated that preschool students first developed a sensitivity to sound similarities followed later by an awareness of the individual sounds. Several researchers argue that the earlier a child can be identified as “at-risk,” the sooner interventions can be put in place to help strengthen phonological skills (Bell, 2010; Hurford et al., 1994; Jenkins et al., 2007; & Welsh et al., 2010). Children struggling with oral language development require support in order to develop language while also receiving the acknowledgment from teachers and peers (Dockrell, Stuart, & King, 2013). Preschools vary greatly, and it is important to develop supports for oral language development for all children (Dockrell et al., 2013). Phonological training helped kindergarten children develop better attention and awareness for the linguistic structures in language (Catts et al., 2001; Lyster, 2002; Mann & Foy, 2003).

According to Desimone (2009), a challenge to researchers in the area of teacher professional development is the multitude of experiences that make up teacher learning. Arguing that research has given educators a clear picture of what effective professional development includes, Desimone (2009) recommends using the information to improve the quality of teacher training. Desimone (2009) suggests moving away from past research biases, tied to particular research tools. Doing so would allow for valuable, additional research which should be judged on the quality of design and methodology.

**The Role of Teacher Knowledge and Beliefs about Phonemic Awareness**

During kindergarten and the first grade school years, elementary teachers face the challenging task of teaching students to read. Generally, student teachers and practicing teachers believe they are only somewhat prepared to teach reading to students (Bos et al., 2001). Student teachers and practicing teachers also perceive themselves as somewhat prepared to utilize phonological awareness and phonics in their teaching (Bos et al., 2001). In research by Bos et al. (2001), student teachers scored incorrectly on four of eight items linked to phonics. The same student teachers answered seven of 12 questions associated with phonological awareness incorrectly (Bos et al., 2001). Current teachers scored higher than student teachers on phonological awareness knowledge, however, still only scored an average of 12 out of 20 items correctly (Bos et al., 2001). Research results suggest educators responsible for teaching reading have an incomplete knowledge about specific language structures included in phonological awareness (Bos et al., 2001; McCutchen et al., 2002).

Comparing teacher perceptions and knowledge can be tricky. While student teachers and currently practicing teachers agree poor phonemic awareness leads to reading difficulty, two-thirds of a research group misunderstood the components of phonological awareness (Bos et al.,

2001). Preservice teachers indicated strong beliefs regarding phonics and skill instruction in research conducted by Barnyak and Paquette (2010). Educators are prepared to discuss the risk factors for reading acquisition, but not the language structures required for reading (McCutchen et al., 2002; Spear-Swerling & Brucker, 2003; Spear-Swerling et al., 2005). Teachers comfortable with the language structures in phonological awareness perceive themselves as better prepared to teach reading to all children (Bos et al., 2001). This is a critical finding because educators who felt a greater perception of preparedness are more agreeable to innovations in teaching (Bos et al., 2001).

Even when promising and proven practices are published and shared, teachers often filter these practices through their own assumptions and belief system. What might be a successful and effective practice is then altered, lessening its effectiveness (Stigler & Thompson, 2009). Effective instructional strategies learned in teacher preparation programs are disregarded by teachers because of their personal school experiences (Barnyak & Paquette, 2010). This makes it difficult to communicate and fully implemented new teaching strategies (Stigler & Thompson, 2009). Wells and Wells (2001) argue that teacher goals and classroom reality do not match. Teacher beliefs are not always predictors of actual classroom practice (McCutchen et al., 2002; Spear-Swerling et al., 2005).

Progress in the linguistic field has been very slow due to inaccurate information, incomplete knowledge, and language stereotypes that educators inherit and then pass on to future generations (Shuy, 2001). According to Wells and Wells (2001) the relationship between language and learning has long been recognized by educators. Advances in knowledge about reading instruction do not appear to have had a substantial impact on teacher knowledge (Bos et

al., 2001). Teachers remain confused about the differences between phonological awareness and phonics, which in turn, limits the ability to teach reading to young children (Bos et al., 2001).

Several myths perpetuated by educators over the years, include that children learn language by imitating others (Fox & Zidonis, 2001). Language is functional in nature rather than focused on form and so becomes self-generated for that reason (Shuy, 2001). Educators lose the natural learning that students bring to school from self-generated language if they try to impose too much school-generated language (Shuy, 2001). Evidence from filming shows children contribute to their own use of language by generalizing (Fox & Zidonis, 2001).

Children who do not say anything, do not know the information is another myth according to Fox and Zidonis (2001). This is a bias of the teacher and children can comprehend language structures that they do not yet use (Fox & Zidonis, 2001). Another myth is that grammar is in place by school age; however some syntactic structures are not fully mastered until the upper elementary years (Fox & Zidonis, 2001). Assuming assessments accurately represent what a child knows is another myth, according to Fox and Zidonis (2001). This myth was illustrated by test items presented in a negative or passive format resulted in higher student errors (Fox & Zidonis, 2001).

A mistaken belief held by some educators is that words mean the same to everyone (Fox & Zidonis, 2001). The context of language is relevant, and so educators should have at the core of learning how to navigate a variety of contexts (Shuy, 2001). According to Fox and Zidonis (2001), this myth frequently causes communication barriers and misunderstandings. The Social Gating Hypothesis, presented by Kuhl (2010), suggests social interaction creates different learning experiences for each child. Gating includes factors introduced by social context including attention or arousal, information, relationship, and brain mechanisms (Kuhl, 2010).

Brain mechanisms link perception and action (Kuhl, 2010). During interactions with live people, infants will follow the person's gaze, look at pictures in a book, or focus on toys as the individual speaks (Kuhl, 2010).

The last myth explored by Fox and Zidonis (2001), is that children should work more and play less with language. Meaningful activities allow for varied and rich use of language associated with a variety of functions (Anthony, 2003; Fox & Zidonis, 2001). Conversation is critical during the preschool years where children are "learning to talk, but also talking to learn" (Wells & Wells, 2001). In their research though, Wells and Wells (2001) found school conversations dominated by the teacher. Schools do not provide linguistically rich environments even for those students from deprived backgrounds (Wells & Wells, 2001). It is through frequent opportunities for collaborative talk with teachers and other adults that children learn language effectively (Anthony, 2003; Wells & Wells, 2001).

Language is holistic and constructivist so does not fit into the model most educators use in the classroom (Shuy, 2001). Classrooms use a reductionist model that breaks language down into smaller segments (Shuy, 2001). According to Shuy (2001) language education should include constructivist, holistic, functional, natural, self-generated, and contextual approaches. Shuy (2001) differentiates between language and writing by stressing language is self-generated, but writing is almost completely school-generated.

**Reading Readiness Skills and Their Impact on Early Reading Development**

School readiness is more than just academic progress. According to Gonzalez et al. (2011), children do not all come to school equally prepared to learn. Effective curricula in early education strengthen cognitive and non-cognitive skills (Council of Economic Advisers, 2014).

Developmental studies suggest children learn at a younger age and can learn more than previously thought (Kuhl, 2011).

Children need high-quality preschool programs with excellent instruction to be prepared for reading success (Council of Economic Advisers, 2014; Gonzalez et al., 2011). Preschools vary, and it is important to develop supports for oral language development for all children (Dockrell et al., 2013). The literature demonstrates that preschool benefits school readiness, increase future earnings and leads to further education later (Council of Economic Advisers, 2014). Educators, advocacy groups, policy makers, and researchers are calling for changes in early literacy education as a response to disappointing trends in which low-income and minority children are still not receiving high-quality preschool experiences (Council of Economic Advisers, 2014; Gonzalez et al., 2011).

First steps to school readiness for all children is to examine whether teachers are provided the professional development necessary to foster that school readiness (Landry et al., 2009). School readiness has been described to include the physical, social and emotional health and motor development of a child along with the child's language development, cognition, and general knowledge (National Educational Goals Panel, 1990). There exists some debate over these characteristics and how they should be measured **(**Ackerman & Barnett, 2005; Blair & Diamond, 2008**).**

There is a growing consensus that high-quality preschool instruction is foundational for children, yet there is a mismatch in the quality of the preparation of early childhood educators (Ackerman & Barnett, 2005; Landry et al., 2009). Quality instruction and intervention in preschool education would maximize the number of children entering kindergarten with sufficient phonological awareness skills to access reading instruction (Phillips et al., 2008).

Greater attention to language instruction, including vocabulary development in preschool, benefits all children and teacher capacity to influence word knowledge is part of a growing body of research (Phillips et al., 2008).

There are natural connections that can be made from the research on the development of early reading skills. Researchers and educators are asking the question, “How can the connections between preschool and kindergarten be strengthened?” Emig (2000) cites kindergarten entry as a critical time for a child’s development, so preschool teachers should be dialoging with kindergarten teachers to ease this transition. Across the five key components of reading instruction (National Reading Panel, 2000), teachers reported they received training in phonological awareness most often (Vesay & Gischlar, 2013). Unfortunately, teachers often do not get the in-depth training necessary for high-quality literacy instruction (Ackerman & Barnett, 2005; Phillips et al., 2008; Vesay & Gischlar, 2013).

A 2014 report published by The United States Department of Education stated there is a need for high-quality preschool programs throughout the United States. Children who have high-quality early learning experiences are more prepared to succeed in kindergarten and later years, however, less than three in ten children aged four are enrolled in high-quality preschool programs (US Department of Education, 2014). President Obama’s Preschool for All Program (2014) is part of a Department of Education 10-year plan that builds and strengthens the current state systems in order to provide a high-quality preschool program each child in the United States.

Research also demonstrates phonological awareness skills in preschool as one of the most consistent predictors of school reading success in the first few years of formal schooling (Bingham & Patton-Terry, 2013; Callaghan & Madelaine, 2012; Mann & Foy, 2003; Ouelette &

Haley, 2013). The development of foundational literacy skills is critically important before the start of formal schooling (Ackerman & Barnett, 2005; Fielding et al., 2004; Missall et al., 2007). The risk for reading failure is high for children who enter school behind their peers in early literacy development (Ackerman & Barnett, 2005; Fielding et al., 2004; Missall et al., 2007). Smith (2009) found very young children that demonstrated greater difficulties with language production than their peers, often showed evidence of reading disabilities later in life. Children having reading disabilities produced fewer words overall with less complexity in the words they chose (Smith, 2009). According to Smith (2009), children with reading disabilities chose words with fewer syllables and had a greater percentage of partially intelligible and unintelligible speech than the other groups. 30-month-old children, who were later diagnosed with a reading disability, used a slower speaking rate while engaging in spontaneous speech than children without a reading disability (Smith, 2009).

Findings by Bell (2010) and Lonigan, Farver, Phillips, and Clancy-Menchetti (2011), demonstrated it is possible to utilize a skill-focused curriculum in preschool and still be developmentally appropriate. Higher levels of teacher directed activities along with small and large group instruction are necessary to close the achievement gap for at-risk preschool students (Lonigan et al., 2011; Pullen & Justice 2003). Phonological awareness should be included in the everyday activities of every preschool classroom (Pullen & Justice 2003). Explicit instruction refers to meaningful, enjoyable, and engaging activities, not drill type activities (Pullen & Justice, 2003).

A number of studies have shown phonological development in kindergarten to be a strong factor in predicting future reading performance (Ehri et al., 2001; Engen & Hoien, 2002; McGuiness et al., 1995; Shanahan, 2006). Results demonstrated by Engen and Hoien (2012)

indicated there are children who still do not master the simple tasks associated with phonological awareness even by the end of first grade. Research is abundant which demonstrates children displaying weak phonological skills continue to have reading difficulties (Bingham & Patton-Terry 2013; Callaghan & Madelaine, 2012; Catts et al., 2001; Engen & Hoien, 2002; Foy & Mann, 2003; Hurford et al., 1994; Hutchinson et al., 2000; Kerins, 2006; McGuinness et al., 1995; Ouellette & Haley, 2013; Vandervelden & Siegel, 1995; Walsh, 2009). Furthermore, poor readers often demonstrate several weaknesses in phonological development when compared to children with normal reading proficiency (Engen & Hoien, 2002; McEwan, 1997; McGuiness et al., 1995).

Torgeson (2000) found even with good classroom instruction, approximately 20% of children failed to acquire a sufficient foundation of phonological awareness. Students enter formal schooling at different levels of early reading skills and this variability, suggests Callaghan and Madelaine (2012) and Foy and Mann (2003), is largely due to the home environment. There are specific associations, according to Foy and Mann (2003), between the home environment and the development of pre-reading skills leading to phonological awareness. Differences in the home environment may be a result of beliefs or attitudes of the parents around early literacy (Foy & Mann, 2003). The mothers' education appears to be an important predictor of reading development (Catts et al., 2001; Cottone, 2012; Hutchinson et al., 2000; Lyster, 2002; Stevenson & Baker, 1987).

Parents have long been considered critical in the development of their child's reading skills (Burgess, Hecht, & Lonigan, 2002; Grolick & Slowiaczek, 1994; National Reading Panel, 2000; Reutzel, Fawson, & Smith, 2006; Warren et al., 2013). Many preschool parents are anxious and willing to help their children become successful readers (Ehri et al., 2001). There is

no argument regarding the importance of home in a child's development (Cottone, 2012; Stevenson & Baker, 1987; Warren et al., 2013). Burgess et al. (2002) and Cottone (2012) based part of their research hypothesis on the body of work from the past three decades which recognized the importance of home in the development of early reading skills. Access to high-quality preschool programs serves as a win-win for students, parents, and society (Council of Economic Advisers, 2014). Research suggest investment in early childhood programs leads to expansion of the workforce and higher earnings (Council of Economic Advisers, 2014).

Callaghan and Madelaine (2012) state that preschoolers enter kindergarten with varying levels of emergent skills due in part to the home environment. One reason it may be difficult to measure the effects of the home literacy environment on phonological awareness is that these factors may be mediated by other factors such as previous letter knowledge and vocabulary (Foy & Mann, 2003). The connection between the home literacy environment and phonological development is largely unexamined (Foy & Mann, 2003).

Nancy Kerr, President of the National Children's Reading Foundation stated, "From birth to kindergarten, a child who is read to at least 20 minutes a day absorbs 600 hours of structured language" (Fielding et al., 2007, p. 219). Cottone's (2012) results indicated when mothers spend more time on the enjoyable aspects of reading such as storytelling, reading for pleasure, and singing, there is a greater interest in reading and motivation to read in the child which leads to more proficient reading skills. Parents who read with their children help them get interested in reading at an early age and model good reading habits (National Reading Panel 2000). Foy and Mann (2003) found the practice of shared reading in the home helped build receptive vocabulary in children.

Outside the classroom environment, the home environment is an important source of exposure for children (Burgess et al., 2002; Foy & Mann, 2003). Foy and Mann (2003) suggest exposure to print by parents at an early age is not sufficient for the acquisition of phonological awareness skills in young children. Similar to the development of vocabulary, learning to identify letters takes practice with letter names and their sounds.

Parents with more education were more involved in activities at school including Parent Teacher Associations/Organizations and parent-teacher conferences (Grolick & Slowiaczek, 1994; Stevenson & Baker, 1987). Parents of younger children were more likely to be involved in school activities, and this was especially true for parents with young boys (Stevenson & Baker, 1987). This parent involvement may be a result of parental understanding about the importance of early schooling and the value of their involvement (Baker & Scher, 2002; Grolick & Slowiaczek, 1994; Stevenson & Baker, 1987).

Warren et al. (2013) describes the lack of research on the parent's potential for teaching phonemic awareness to their children. Most of the research conducted on phonological processing, family support, and self-concept associated with reading has been done in isolation (Hutchinson et al., 2000). Widespread belief that family support is important in early literacy development exists; however, there is little agreement on how to investigate this factor (Hutchinson et al., 2000; Reutzel, et al., 2006).

Another interesting finding was that gender differences were found specifically in reading and memory tasks with girls scoring higher causing researchers to hypothesize girls may have an advantage when it comes to memorizing the alphabet code (Lundberg et al., 2012; McGuinness et al., 1995). In a study by McGuinness et al. (1995), girls performed higher in some areas of reading development. Deficiencies in phonological awareness appear to have more

of an impact on boys (Limbrick, Wheldall, & Madelaine, 2011; McGuiness et al. 1995). One explanation does not account for more boys struggling in reading (Limbrick et al., 2011). In fact, gender does not appear to be a strong predictor of reading ability (Limbrick et al., 2011).

The duration of preschool attendance was a significant predictor of educational success with the hypothesis that prior school experience prepares students for the demands of kindergarten (Ladd & Price, 1987). Beyond behavior, Ladd and Price (1987) found the transition context as a predictor of peer status in kindergarten. Students who had previous classmates formed a secure base from which to develop new relationships and extend their social connections (Ladd & Price, 1987). Peer connections built confidence in children thus encouraging them to build more personal relationships with other children (Ladd & Price, 1987).

Age was studied in research conducted by Huang and Invernizzi (2012), with the youngest students consistently having lower phonological awareness scores than the oldest students. The youngest students gained literacy skills at a faster rate than the oldest students which resulted in a narrowing of the age gap over time; however, Huang and Invernizzi (2012) found the age gap remained statistically significant at the end of grade two.

**The Role of Executive Function of the Brain and Its Impact on Early Reading Development**

Past and current research explores many factors, including executive function of the brain and the home environment, effecting the acquisition of phonemic awareness (Callaghan & Madelaine, 2012; Cartwright, 2012; Foy & Mann, 2003; Welsh et al., 2010; Willoughby et al., 2012). Researchers continue to explore the connection between executive function of the brain and the components of reading development with mixed results (Blair & Razza, 2007; Cartwright, 2012; Cuevas et al., 2012; Foy & Mann, 2013; Ponitz et al., 2009; Welsh et al., 2010; Willoughby et al., 2012).

Executive function and its associated brain development parallels reading acquisition and has profound implications for early reading development (Blair & Razza, 2007; Cartwright, 2012, McClelland et al., 2005; Ponitz et al., 2009; Willoughby et al., 2012). In order to complete tasks and manage behavior, children must purposely direct their mental processes and actions to reach particular goals (Banich, 2009; Carlson, 2005; Cartwright, 2012; McClelland et al., 2007). Between the ages of three and five, children demonstrate dramatic growth in executive function including higher order cognitive and self-regulatory processes (Blair & Razza, 2007; Carlson, 2005; Cartwright, 2012; Foy & Mann, 2013; Welsh et al., 2010). Within the definition of executive function are the fundamental skills of attention, working memory, inhibitory control and cognitive flexibility (Banich, 2009; Carlson, 2005; Cartwright, 2012; Espy & Bull, 2005; Foy & Mann, 2013; McClelland et al., 2005; Welsh et al., 2010; Willoughby et al., 2012).

Even in infancy, children begin to develop executive function skills and by age three, demonstrate working memory along with the ability to shift attention, and inhibitory control (Carlson, 2005; Cartwright, 2012; Kuhl, 2011). Working memory, attention, and inhibitory control all develop substantially between the ages of three and five or the preschool years (Carlson, 2005; Cartwright, 2012; Espy & Bull, 2005; Hongwanishkul, Happaney, Lee, & Zelazo, 2005; Kuhl, 2011; Welsh et al., 2010). Between the ages of three and six, children improve their inhibitory control which aides with the behavioral and cognitive demands of school (Carlson, 2005; Cartwright, 2012; Hongwanishkul et al., 2005; Kuhl, 2011; Welsh et al., 2010). According to research by Carlson (2005), natural maturation at the biological level (brain) and contextual level (social experiences) help children to comprehend rules and the self-regulation to follow them.

Recent research found executive function skills to be an indicator of future reading performance (Cartwright, 2012; Foy & Mann, 2013; Grolick & Slowiaczek, 1994; McClelland et al., 2005; Ponitz et al., 2009; Welsh et al., 2010). Working memory and inhibitory control are two of the most studied executive functions and often linked (Foy & Mann, 2013). As hypothesized by Cuevas et al., (2012), higher post-kindergarten executive function skills were associated with higher pre-kindergarten levels of temperament based inhibitory control and working memory task performance. Cuevas et al. (2012) found pre-kindergarten executive function measures accounted for 57% of the variance in post-kindergarten executive function measures.

Foundational skills for executive function, just like the phonological foundations for literacy, may develop before children start formal schooling (Foy & Mann, 2013; McClelland et al., 2005; McClelland et al., 2007; Ponitz et al., 2009; Welsh et al., 2010; Willoughby et al., 2012). Puolakanaho et al. (2003) found children as young as three and a half years of age could attend to a task involving identification and blending of phonological segments when presented in a motivating context. In contrast, Adams and Snowling (2001), found students with attention problems scored lower on reading tasks involving phonemic awareness that required inhibition of familiar responses. Research results showed verbal and nonverbal executive function skills appear to be independent of each other with students making more errors on verbal tasks (Foy & Mann, 2013). Table 1 displays a complete list of executive functions.

Table 1

*Processes Typically Included in the Definition of Executive Function*

| Process | Definition |
|---|---|
| Attention Control | Ability to focus on information or a task even with distractions or fatigue |
| Cognitive Flexibility | Ability to consider multiple pieces of information or ideas at one time and switch between them when involved in a task |
| Inhibition or Inhibitory Control | Ability to restrain normal or habitual responses |
| Initiation | Ability to begin a task |
| Metacognition | Ability to reflect on thoughts, perspectives, and assess their effectiveness |
| Organization | Ability to order information and objects or to create systems for managing information or objects |
| Planning | Ability to decide which tasks are needed to complete a goal, including understanding the importance and order in which the tasks should be completed to most effectively reach the goal |
| Response to Feedback | Ability to adjust one's behavior or alter one's plan when given new information |
| Self-Regulation | Ability to control one's behavior and emotions in order to achieve goals |
| Switching or Shifting | Ability to change one's attention from an initial idea to a new one (related to cognitive flexibility) |
| Working memory | Ability to hold information in mind to support the completion of tasks |

*Note.* Table includes definitions of typical executive function processes (Cartwright, 2012).

Three phonological abilities have been identified by research: phonological memory, phonological access to lexical storage, and phonological awareness (Anthony & Francis, 2005).

Phonological memory is the coding of sound-based representations into memory (Anthony & Francis, 2005). According to Anthony and Francis (2005), phonological access to lexical storage is the ability to retrieve easily these sound-based codes from memory. The levels of phonological processing including memory develop markedly during reading development (Nithart et al., 2011). In fact, phonological memory eventually becomes more critical as students are required to memorize information during the acquisition of higher level reading skills (Nithart et al., 2011). These abilities are interrelated, and all tied to reading acquisition. Difficulties with phonological awareness appear to be part of a more general problem with the phonological processes including verbal working memory and verbal perception (Foy & Mann, 2013).

**Conclusion**

This literature review illustrates the many factors influencing the development of phonemic awareness. The role of phonemic awareness, a subcomponent of phonological awareness, was defined and reviewed regarding its specific impact on early reading development. During the review of literature, several factors emerged with potential implications for this study. These factors affecting phonemic awareness acquisition can be grouped into the following themes seen in Figure 8.

Figure 8

*Emerging Literature Themes*

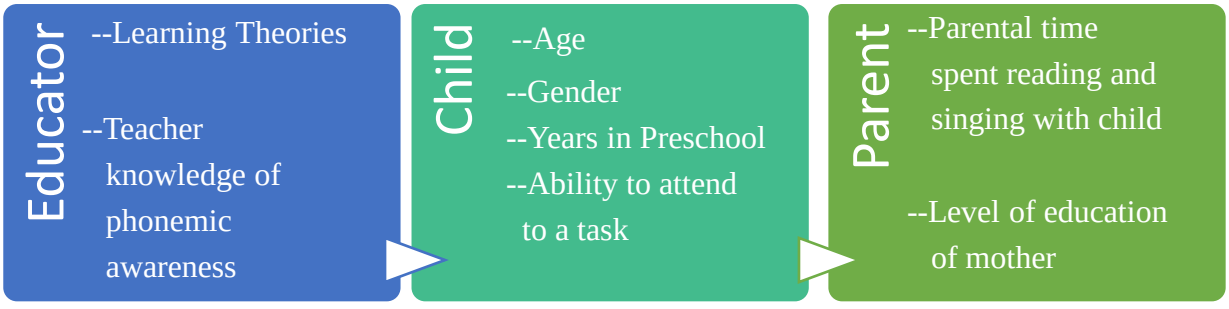



*Figure 8.* Visual representation of the emerging literature themes from the literature review conducted for this study. Created by the researcher, D. Harris, 2016.

The research demonstrates implications for educators, parents, and children. The triad of teachers, parents, and children are intertwined when it comes to the development of early reading skills. Furthermore, the research connects learning and teaching as well as learning and home (Cottone 2012; Fielding et al., 2007; National Reading Panel, 2000; Stevenson & Baker, 1987; Warren et al., 2013). Teacher knowledge in phonemic awareness and student achievement will be investigated in-depth to identify the specific relationship and its impact on the development of phonemic awareness skills in young children.

The literature review supports the premise that a child's reading development begins with early reading readiness skills that are affected both positively and negatively by outside forces. Additionally, both preschool educators and parents play a significant role in the development of reading skills. Warren et al. (2013) and Reutzel et al. (2006) demonstrated that parental involvement in phonemic awareness tutoring in kindergarten and first grade increased reading readiness skills. The partnership between formal schooling at kindergarten and both preschool educators and parents is essential to student success.

While the literature stresses the importance of phonological development and its critical role in reading development along with parent involvement as key to a child's success in education, the research appears inadequate in identifying the factors impeding the development of phonemic awareness in young children in general. Ladd and Price (1987) suggest understanding factors that predict a child's social functioning and school adjustment would help educators design programs to facilitate children's competence. Reutzel et al. (2006) propose some parents lack the instructional skills necessary to work productively with their children teaching early reading skills. Additional research in this area would provide parents with concrete examples of quality strategies to support their child's learning. More research is also

needed to identify what teachers need to know and be able to do to teach phonemic awareness effectively and to integrate their instruction with other elements of beginning reading instruction (Bos et al., 2001; Cheesman, 2009; Ehri et al., 2001; Landry et al., 2009; Spear-Swerling et al., 2005).

# Chapter III

## Design and Methodology

### Introduction

This chapter discusses the quantitative research design and methods used to collect and analyze data related to kindergarten teacher knowledge of phonemic awareness and kindergarten student data in phonemic awareness. The researcher's role along with descriptions of the study's settings, site, and population are discussed. Included is a discussion on the trustworthiness of the data and ethical considerations. Instruments, such as the Survey of Teacher PhAKS (Phonemic Awareness, Knowledge, and Skills) and Teacher Demographics Questionnaire are located in the appendices of this study.

In quantitative research, it is the variables that create curiosity in the researcher (Tanner, 2012). The researcher may start with questions and theories about the variability of the categories measured and the relationship between them (Tanner, 2013). Yoshikawa, Weisner, Kalil, & Way (2013) define quantitative methods as those that analyze numeric representations while qualitative methods are non-numeric representations. Ercikan and Wolff-Michael (2006) suggest if the purpose of educational research is to generate new knowledge, then it is the research question, not the methods that should drive the research design. A researcher must make choices about data sources, data analysis, and data construction to best answer their research question. According to Ercikan and Wolff-Michael (2006), various approaches and multiple modes of inquiry are necessary.

This study investigated two research questions exploring the topic of phonemic awareness at the kindergarten level. The questions addressed by this research study included the following:

1. What is the relationship between kindergarten teacher knowledge of phonemic awareness and developing phonemic awareness skills in kindergarten students as measured by the Survey of Teacher PhAKS (Phonemic Awareness, Knowledge, and Skills) and the Dynamic Indicators of Basic Early Literacy Skills (DIBELS Next Edition) Assessment?
2. What is the relationship between kindergarten teacher knowledge of phonemic awareness as measured by the Survey of Teacher PhAKS (Phonemic Awareness, Knowledge, and Skills) and years of teaching and type of degree held by the teacher?

**Research Design**

This study investigated kindergarten teacher knowledge of phonemic awareness. Additionally, it correlated kindergarten teacher knowledge of phonemic awareness with their students' proficiency in phonemic awareness measured by the knowledge of letter sounds.

A quantitative approach was utilized as a means of collecting and analyzing the data. In this study the antecedent variable was teacher knowledge of phonemic awareness and, as the independent variable thought to have an effect on student achievement. The dependent variable was student performance on the *First Sound Fluency* portion of the Dynamic Indicators of Basic Early Literacy Skills Assessment (DIBELS Next Edition) Benchmark Assessment and was the variable judged affected.

There are five steps in the quantitative research process including identifying a sampling process, describing the types of permissions needed, recognizing the types of data to collect,

determining the data recording process, and understanding the ethical issues possible (Creswell, 2014, p. 171). Koro-Ljungberg et al. (2009) argue that research methods should be open and accessible to the audience.

This quantitative study examined three fundamental components of kindergarten reading education: (a) teacher knowledge; (b) teacher experience and training; and (c) student achievement. First, the study investigated phonemic awareness knowledge demonstrated by teacher participants. Secondly, this study examined the relationship between teacher knowledge of phonemic awareness with the number of years teaching and the type of degree held by the teacher. Lastly, this study correlated teacher knowledge of phonemic awareness with the proficiency of kindergarten students in phonemic awareness using the *First Sound Fluency* benchmark scale from the Dynamic Indicators of Basic Early Literacy Skills Assessment (DIBELS Next Edition). The use of standard questions on the Survey of Teacher PhAKS (Phonemic Awareness, Knowledge, and Skills) allows for comparisons between the respondents (Muijs, 2004).

Table 2

*Data Collection Methods*

| Data Collection |
| --- |
| Teacher Demographic Data |
| Teacher Knowledge Survey |
| Kindergarten Student DIBELS Scores |

*Note.* Data collection methods used by research D. Harris, 2016.

Data collection techniques were selected and utilized to create as little disruption to the participants' everyday instruction and learning as possible. Teacher responses were possible outside the instructional day causing no interruption to teaching. Ex-post facto kindergarten student data was collected with no impact on student learning.

**Establishing Trust**

Potential ethical issues were carefully considered in the implementation of procedures used in this study. Examples of ethical procedures are included in the informed consent form collected from participating teachers in the study. (See Appendix D.)

Table 3

*Research Activity Timeline*

| Research Activity | Dates |
|---|---|
| Final preparation and validation of data tools | January-August 2015 |
| Distribute Teacher Knowledge Survey | End of September 2015 |
| Collect Fall and Winter 2014-2015 DIBELS Benchmark Student Data | September-October 2015 |
| Data Analysis | October-December 2015 |

*Note.* Timeline for research activities utilized in this study.

**Participants**

A sample size of 1,258 kindergarten student assessment data sets on the *First Sound Fluency* portion of the Dynamic Indicators of Basic Early Literacy Skills Assessment (DIBELS Next Edition) was analyzed in this study. This sample included approximately 80 percent of all kindergarten students from each general education classroom in the North Point School District's (pseudonym) 21 elementary schools. Twenty percent of kindergarten students were eliminated from the study because they were in a class where the teacher no longer taught kindergarten or

the student had only one assessment score. There were 57 general education kindergarten teachers within the North Point School District, fictional name, invited to participate in this study. Every general education kindergarten teacher with DIBELS assessment scores from the 2014-2015 school year and still teaching kindergarten in the 2015-2016 school year was invited to participate. Creswell (2014) states a larger sample decreases the chances of potential error that the sample will differ from the population.

**Setting**

The school district participating in this study was a large suburban school district of approximately 21,759 (May 2015) students (OSPI Report Card, 2015). The school district employed approximately 1,083 certificated teachers and 1,388 classified employees. Teacher statistics for the 2014-2015 school year identified the average years of teaching experience as 14.9 with 68.7% of teachers holding at least a Master's Degree (OSPI Report Card, 2015). 95.6% of classes were taught by teachers meeting the ESEA highly qualified (HQ) definition (OSPI Report Card, 2015).

Table 4

*District Demographics*

| | |
|---|---|
| Gender | 51.8% Male, 48.2% Female |
| Ethnicity | Hispanic, 15.2%; American Indian/Alaskan Native, 0.9%; Asian, 4.7%; Black/Africa American, 3.6%; Native Hawaiian/Pacific Islander, 1.3%; White, 62.7%; Two or more races, 11.6% |
| Free or Reduced Lunch | 35.3% |
| Special Education | 12.8% |
| Transitional Bilingual | 3.4% |

| | |
|---|---|
| Unexcused Absence Rate | 0.4% |
| Adjusted 4-Year Cohort Graduation Rate | 84.2% |

*Note.* District demographic profile (Office of Superintendent of Public Instruction Washington State Report Card, 2015).

Table 5

*Participating School Demographics*

| School Size (K-6 Students) | Number of Teacher Participants | Number of Student Participants | Free/Reduced Lunch Rate | Transitional Bilingual Percentage | 3rd Grade English Language Arts (ELA) Smarter Balanced Assessment (SBA) Results (14-15) |
|---|---|---|---|---|---|
| A-706 | 2 | 39 | 30.2% | 3.7% | 55.4% |
| B-986 | 4 | 89 | 35.0% | 4.4% | 49.2% |
| C-793 | 4 | 87 | 23.6% | 1.4% | 40.1% |
| D-570 | 4 | 74 | 63.3% | 20.5% | 51.5% |
| E-575 | 3 | 73 | 26.4% | 2.3% | 69.8% |
| F-643 | 4 | 76 | 41.1% | 5.3% | 32.0% |
| G-351 | 1 | 21 | 59.5% | 17.9 | 30.6 |
| H-423 | 1 | 24 | 31.0% | 1.4 | 56.2 |
| I-434 | 2 | 44 | 31.8% | 1.2% | 41.9% |
| J-316 | 2 | 41 | 36.4% | 3.5% | 48.3% |
| K-365 | 2 | 47 | 37.8% | 8.5% | 50.0% |
| L-557 | 3 | 67 | 36.3% | 3.6% | 41.4% |
| M-520 | 3 | 71 | 38.5% | 4.2% | 48.4% |
| N-586 | 4 | 95 | 20.6% | 2.4% | 51.6% |
| O-305 | 2 | 32 | 62.0% | 5.2% | Suppressed |
| P-356 | 2 | 36 | 63.2% | 4.8% | 51. % |
| Q-541 | 3 | 73 | 51.2% | 4.6% | 23.6% |
| R-303 | 2 | 43 | 53.1% | 6.3% | 59.4% |
| S-524 | 3 | 69 | 56.9% | 7.4% | 45.5% |
| T-696 | 4 | 77 | 47.4% | 1.9% | 37.9% |
| U-825 | 3 | 60 | 33.2% | 5.2% | 63.7% |
| Total 21 | 57 | 1,238 | | | |

*Note.* Demographic profiles for each of the schools participating (Office of Superintendent of Public Instruction Washington State Report Card, 2015).

**Data Collection**

Data collection for this study took place between September 1, 2014 and December 31, 2015. In this study, quantitative research methodology allowed the researcher to measure teacher knowledge of phonemic awareness. Informed consent forms were sent to each teacher explaining the research and asking for their participation.

One of the most common quantitative research tools is survey research (Muijs, 2004). Surveys provide flexibility to researchers because questionnaire forms can be administered by telephone, face-to-face, paper and pencil, mail or the web (Muijs, 2004). Surveys, such as the Survey of Teacher PhAKS (Phonemic Awareness, Knowledge, and Skills) used in this study, are an efficient way to collect large amounts of data (Muijs, 2004).

Teacher knowledge of phonemic awareness was collected from teacher responses on a validated survey titled, the Survey of Teacher PhAKS (Phonemic Awareness, Knowledge, and Skills), created by Elaine Cheesman (2009) (See Appendix B). The Survey of Teacher PhAKS (Phonemic Awareness, Knowledge, and Skills) included nine initial items assessing teacher knowledge about phonemic awareness instruction. The first six questions contained a foil that was an answer describing phonics (Cheesman et al., 2009). The phonics foils represented the connections between letters and the speech sounds used to read and spell. These answers contrast with the phonemic awareness responses in the same questions that represented recognition and work with the sounds of spoken language. Questions one to four measured the respondent's understanding of the definition and content related to phonemic awareness (Cheesman et al., 2009). Survey questions five to seven gauged the teacher's ability to identify activities that related to phonemic awareness development (Cheesman et al., 2009). Question eight measured the teacher's knowledge of task difficulty (Cheesman et al., 2009). Question nine addressed the

student who would benefit from phonemic awareness instruction (Cheesman et al., 2009). Questions 10, 11, and 12 measured the respondent's ability to identify and match phonemes in written words. Items 13 and 14 addressed the capacity to recognize what part remains in a word once an individual sound was deleted (Cheesman et al., 2009).

Content validity was completed for the Survey of Teacher PhAKS before final development of the tool (Cheesman et al., 2009). A question pool of 25 items was rated by 17 experts chosen based on experience in phonemic awareness instructions and professional accomplishments (Cheesman et al., 2009). The experts represented university professors, special education teachers, language therapists, and state department of education consultants (Cheesman et al., 2009). In a 16 item pilot study, Cheesman et al. (2009) used a convenience sample of 127 graduate students enrolled in a teacher education preparation program to test the items. Changes were made to the final instrument based on this pilot study (Cheesman et al., 2009).

The teacher survey used in this study was designed for internal consistency or reliability. Cheesman et al. (2009) conducted an analysis of reliability yielding a Kuder Richardson 20 (K-$R_{20}$)[1] coefficient of .69. The Kuder Richardson Coefficient of reliability (K-R-20) tests to see if the items within an instrument result in the same binary results in a population of test subjects (StatsToDo, 2014; Tanner, 2012). The K-R 20 was developed in 1937 and modified in 1940 by Hoyt to apply to measurements that are not binary in nature (StatsToDo, 2014). This modification by Hoyt has become known as Cronbach's Alpha that has wider applicability as a measurement of agreement or internal consistency (StatsToDo, 2014; Tanner, 2012).

The survey was kept short to encourage responses, so the Spearman-Brown Formula was used to estimate the reliability of scores from a test that was twice as long and similar in content

(Cheesman et al., 2009; Tanner, 2012). By doubling the number of test items and using the Spearman-Brown Formula, the reliability increased to .82 (Cheesman et al., 2009).

Demographic data from teachers including years of teaching experience and educational background was collected. Teaching experience was provided by individual kindergarten teachers in time bands of 1-2 years, 3-5 years, 6-10 years, 11-20 years, and 20 plus years. The response options correspond to the five stages of teacher development identified as novice, advanced beginner, competent, proficient, and expert by Block et al. (2002).

Kindergarten teachers also identified the type of teaching degree(s) held from three choices including early childhood, elementary, and special education. Teachers could also specify a different degree from the options provided in a category marked "other."

Ex-post facto student data was collected from the fall and winter 2014-2015 first sound fluency portion of the kindergarten Dynamic Indicators of Basic Early Literacy Skills (DIBELS Next Edition) Assessment. Three experienced DIBELS testers were each assigned seven of the district's elementary schools. The district Kindergarten Assessment Team conducted the benchmark assessments at each school in September 2014 and January 2015. Each student was assessed individually by the same district tester for both time periods.

The DIBELS Data System, developed at the University of Oregon in the late 1980's, was initially a holding location for screening measures for students in kindergarten through third grade (Good III & Kaminski, 2014; University of Oregon, 2014). Currently, DIBELS Next and DIBELS 6$^{th}$ Edition are utilized to progress monitor and formally assess students in kindergarten through sixth grade. DIBELS Assessments are used in thousands of schools in all 50 states as well as internationally (University of Oregon, 2014).

The Dynamic Indicators of Basic Early Literacy Skills (DIBELS Next Edition) are a set of measures used to assess the acquisition of early reading skills. DIBELS Benchmark scores are empirically developed, criterion-referenced targets that indicate adequate reading progress (Kaminski & Good III, 2011). The DIBELS Benchmark scores represent cut point indicating risk (Kaminski & Good III, 2011). Cut points for risk represent the skill level where a student is not likely to achieve further reading progress without targeted instructional support (Kaminski & Good III, 2011).

Purposely designed to be short, one-minute fluency measures, DIBELS measures can be used to regularly progress monitor the development of early literacy skills. Seven measures comprise DIBELS that serve as indicators of phonemic awareness, alphabetic principle, accuracy and fluency, comprehension, and vocabulary (Good III & Kaminski, 2014). An ongoing series of studies has documented the reliability and validity of the DIBELS measures (Good III & Kaminski, 2014; Kaminski & Good III, 2011).

Organization of the data began with the collection of the informed consent forms from kindergarten teachers. The teacher demographic questions and Survey of Teacher PhAKS were coded in teacher sets for later comparison. Teacher names, along with student and teacher data, were stored in locked file cabinets. All data was stored in a safe environment with only the researcher having access to the passwords.

**Analytical Methods**

The first research question posed in this study investigated the relationship between kindergarten teacher knowledge of phonemic awareness and developing phonemic awareness skills in kindergarten students. The Survey of Teacher PhAKS was administered to kindergarten

teachers and scored to assess teacher knowledge of phonemic awareness. Raw scores on the 15 item measurement were collected and a mean, median, and mode calculated.

Ex-post facto DIBELS data on first sound fluency was collected from the September 2014 initial benchmark testing of new kindergarten students. A second data collection was obtained from the winter benchmark assessment in January 2015. The DIBELS data was available as a numerical score and assigned to the following categories: well below benchmark, below benchmark, and at or above benchmark. A paired sample t-test was conducted using SPSS to analyze the growth in phonemic awareness skills of kindergarten students as measured by the DIBELS *First Sound Fluency* measure in the fall and winter of the same school year. Dependent samples are defined as closely matched observations such as before and after test scores (Runkel, 2013). The paired t-test was used to determine the mean difference between the two sets of kindergarten student scores (Runkel, 2013).

To test whether kindergarten teacher knowledge of phonemic awareness had a significant correlation with developing phonemic awareness skills in kindergarten students, a Pearson's *r* was used (Tanner, 2012). Correlation values between +1 and -1 signified positive or negative correlations (Tanner, 2012). If one variable goes up and so does the other, then a positive correlation exists; while a decline in the other signifies a negative correlation (Tanner, 2012). A Pearson's *r* was utilized to describe the relationship between the Survey of Teacher PhAKS raw score for a kindergarten teacher and the same teacher's corresponding mean growth score for the paired set of student DIBELS data.

To answer the second research question about the relationship between kindergarten teacher knowledge of phonemic awareness, years of teaching and type of degree held by the kindergarten teacher, an ANOVA was utilized. Using an ANOVA, accuracy scores from teacher

responses to the phonemic awareness knowledge survey (PhAKS) were analyzed with demographic groups defined by years of teaching experience and also by type of degree. The analysis of variance (ANOVA) is used to compare any number of groups in one test (Tanner, 2012). A resulting p-value equal to or less than 0.05 was considered significant.

Table 6

*Analytical Methods*

| Quantitative Methods |
| --- |
| SPSS |
| Paired Sample T-Test |
| ANOVA |
| Pearson Correlation |
| Cronbach's Alpha—internal reliability |
| Spearman-Brown Formula--reliability |

*Note*. Quantitative methods used in study by researcher D. Harris, 2016.

**Limitations**

Limitations are possible weaknesses in the study identified by, and outside the control of, the researcher (Creswell, 2014). Limitations should be clearly outlined and are typically related to data collection and analysis (Creswell, 2014). Useful to future researchers, limitations become factors when choosing to do a similar study (Creswell, 2014). Limitations assist readers in judging whether the findings can generalize to other people and situations (Creswell, 2014).

From the start of any study, it is important that the researcher understand and clarify any biases (Creswell, 2013). Researchers should comment on any past experiences, assumptions or biases that may have shaped the approach to the study (Creswell, 2013). Every effort was made

to limit bias in this study. The Survey of Teacher PhAKS (Phonemic Awareness, Knowledge, and Skills) questionnaire was sent to 57 teachers from one school district. The educator surveys were dependent upon the participation of teachers returning the surveys which decreased the sample size available. A second limiting factor were teacher responses to the Survey of Teacher PhAKS. The accuracy of the survey results was dependent upon accurate reflection and completion by individual teachers.

Delimitations in this study were related to the areas being measured and that are controlled by the researcher. One delimitating feature was the use of first sound fluency which is just one area of DIBELS Assessment. This provides a snapshot of just one small area in the big picture of reading development. Phonemic awareness is the sequence of individual sounds or phonemes that make up spoken words (Kaminski & Good III, 2012). Phonemic awareness is fundamental in an alphabetic system because letters are the representation of sounds or phonemes in spoken words. Phonics makes little sense to children without a strong phonemic awareness base (Kaminski & Good III, 2011). The DIBELS *First Sound Fluency* (FSF) measure was selected as a concise, but direct measure of a student's fluency in identifying the initial sounds in words. The *First Sound Fluency* measure of DIBELS measures the basic early literacy skill of phonemic awareness (Kaminski & Good III, 2011).

**Trustworthiness of the Data**

Researchers should employ strategies that document the accuracy of their studies (Creswell, 2013). With accuracy come increased trustworthiness of the data. According to Roberts, Priest, & Traynor (2006), demonstrating and communicating reliability and validity indicates the rigor of the research process and the trustworthiness of the findings.

Reliability is critical in research. As reliability increases, measurement error is decreased (Tanner, 2012). Data reliability is indicated by scoring consistency that can be achieved several ways including testing and retesting using the same measure, retesting with an alternate form, or by the consistency of scoring within a single measure (Roberts et al., 2006; Tanner, 2012). When researchers administer an instrument multiple times, the scores should be the same or nearly the same (Creswell, 2014). This consistency in scoring is called reliability.

Validity refers to the degree that an instrument measures what was intended (Creswell, 2014). Reliability and validity can be overlapping and at other times exclusive (Creswell, 2014). The higher the reliability of scores, the more valid the results (Creswell, 2014).

**Ethical Considerations**

In correlational research, ethical issues appear throughout the process (Creswell, 2014). During data collection, ethics may relate to a sufficient sample size (Creswell, 2014). Data analysis must include complete findings and the use of appropriate statistical procedures (Creswell, 2014). When presenting results, researchers should share and publish data willingly through scholarly publications (Creswell, 2014).

The primary researcher in this study took care to reflect on all ethical considerations. Permission and consent forms, necessary to adhere to Federal, State, and Local Policy, were obtained prior to initiating this study (see Appendices A-I). School District permission was obtained, including the Superintendent and School Board, which followed the required process defined by Board Policy (see Appendices F-G). Each building principal was informed about the study with a request for support. (see Appendix C). Consent to use their responses was obtained from the kindergarten teachers responding to the surveys (see Appendix D). Prior to beginning any data collection, permission was obtained from the Human Research Review Committee

(HRRC) at Northwest Nazarene University (see Appendix I). Artifacts related to the approvals and consents described can be reviewed in Appendices A-J.

It is important to safeguard the protection of all research participants both physically and mentally (French, 2014). This researcher honored the rights of all participants in all aspects of this study. FERPA rights were honored for all participants during the data collection, analysis, and presentation of results. The US Department of Education guidelines were followed for study participants. Appendix H provides evidence of the certification awarded to this researcher by the National Institute of Health (NIH) for conducting human research.

Chapter III described the sampling procedures and the demographics of the school sites included in this study. Further, background information was provided regarding the measurement instruments used in this study. Finally, Chapter III described the analytical processes utilized in this study. The data and findings will be described in detail in Chapter IV.

# Chapter IV

# Results

## Introduction

Reading proficiency is critical for academic and personal success (Bartik, 2014; Chetty et al., 2011; Dynarski et al., 2013; Moats & Foorman, 2003; National Reading Panel, 2000; Reading & Van Deuren, 2007; US Department of Labor, 2014; Walters, 2014). An essential prerequisite for learning to read proficiently includes phonemic awareness (Cheesman et al., 2009; Ehri et al., 2001; Mann & Foy, 2003; Lyster, 2002; National Reading Panel, 2000; Vandervelden & Siegel, 1995). This critical goal of reading proficiency will not be reached by students without phonemic awareness proficiency (Bingham & Patton-Terry, 2013; Ehri et al., 2001; Kerins, 2006; Ouellette & Haley, 2013; Stanovich, 2008; Walsh, 2009). It is reasonable to surmise that teacher knowledge of phonemic awareness has the potential to either hinder or accelerate student achievement in reading. Determining if this is true specifically in kindergarten reading instruction could have profound benefits to kindergarten students learning to read.

This study investigated the relationship between kindergarten teacher knowledge of phonemic awareness and kindergarten student performance in phonemic awareness. First, this study investigated to what extent kindergarten teachers possess the necessary skills in phonemic awareness required to teach phonemic awareness to kindergarten students. Additionally, this study explored the relationship between kindergarten teacher knowledge of phonemic awareness and the developing phonemic awareness skills in kindergarten students. The second research question addressed whether a relationship between kindergarten teacher knowledge of phonemic awareness and years of teaching and type of degree held existed. The research questions guiding this dissertation study included the following:

1. What is the relationship between kindergarten teacher knowledge of phonemic awareness and developing phonemic awareness skills in kindergarten students as measured by the Survey of Teacher PhAKS (Phonemic Awareness, Knowledge, and Skills) and the Dynamic Indicators of Basic Early Literacy Skills (DIBELS Next Edition) Assessment?

2. What is the relationship between kindergarten teacher knowledge of phonemic awareness as measured by the Survey of Teacher PhAKS (Phonemic Awareness, Knowledge, and Skills) and years of teaching and type of degree held?

As described in Chapter III, the data collection methods included:

- A kindergarten teacher survey titled, the Survey of Teacher PhAKS (Phonemic Awareness, Knowledge, and Skills, which assessed kindergarten teacher knowledge of phonemic awareness
- A demographic page asking kindergarten teachers to indicate years of teaching within given range bands
- A demographic page asking kindergarten teachers the type of teaching degree(s) currently held
- Ex-post facto DIBELS benchmark data on *First Sound Fluency* from the fall and winter 2014-2015 assessments

This chapter reports the results of this study. Organization of the results was based on the research questions and reports the data in a complimentary fashion to the order in which it was collected: 1) kindergarten teacher responses to the Survey of Teacher PhAKS; 2) kindergarten teacher responses to the demographic data; and 3) ex-post facto data on kindergarten student performance on the *First Sound Fluency* measure of the DIBELS fall and winter 2014-2015

benchmark assessment. A variety of tables will be presented to summarize the large amount of data collected (Creswell, 2013).

**Survey Response and Participation Rate**

The comprehensive data analysis portion of this research included a teacher survey titled, The Survey of Teacher PhAKS. A total of 57 surveys were sent to kindergarten teachers who taught in the school district during both the 2014-2015 and 2015-2016 school years. The same kindergarten teachers also had DIBELS student data available for the 2014-2015 school year. Of the 57 original teacher surveys sent, 20 surveys were originally returned. A reminder email and a second copy of the survey were sent to the remaining kindergarten teachers. Seventeen additional kindergarten teachers returned the survey for a total of 37 responses received which represents a 65% return rate for the teacher surveys.

**Demographic Section**

In addition to the teacher survey, a demographic page was included. This page included years of teaching experience and the type of degree held by the kindergarten teacher. Each of the 37 respondents completed this information. The 37 kindergarten teachers returning the demographic information along with the teacher survey were all female.

**Research Question #1: The Survey of Teacher PhAKS**

Phonemic awareness or the ability to recognize and segment the phonemes which comprise spoken language is a critical subset of skills necessary for early reading acquisition (Anthony & Francis, 2005). Phonemic awareness is a basic early literacy skill and a predictor of reading acquisition (Carlson et al., 2013; Kaminski & Good III, 2012; Ouellette & Haley, 2013). To answer the first research question investigating the relationship between kindergarten teacher knowledge of phonemic awareness and developing phonemic awareness skills in kindergarten

students, the Survey of Teacher PhAKS (Phonemic Awareness, Knowledge, and Skills) created by Elaine Cheesman (2009) was administered to kindergarten teachers. The Survey of Teacher PhAKS was scored for accuracy to assess teacher knowledge of phonemic awareness. Raw scores on the 15 item measurement were collected and a mean, median, and mode calculated.

Table 7

*Raw Scores from the Survey of Teacher PhAKS*

| Raw Score (Correct Answers) | Score Distribution |
|---|---|
| 1 | 0 |
| 2 | 0 |
| 3 | 1 |
| 4 | 0 |
| 5 | 0 |
| 6 | 0 |
| 7 | 2 |
| 8 | 3 |
| 9 | 4 |
| 10 | 5 |
| 11 | 8 |
| 12 | 5 |
| 13 | 6 |
| 14 | 3 |
| 15 | 0 |
| | Total 37 |

*Note.* The Survey of Teacher PhAKS (Phonemic Awareness, Knowledge, and Skills), created by Elaine Cheesman (2009), measures teacher knowledge of phonemic awareness. Two participants skipped one question each. Skipped questions were omitted from the score.

Outliers are unrepresentative scores and have potential to distort the data (Tanner, 2012). The more extreme the score, the greater the distorting effect (Tanner, 2012). One option is to eliminate the score from the analysis. Outliers are can be defined as scores outside the interval extending from 1.5 times below or above the interquartile range (IQR) (Tanner, 2012). Because the one score of three on the Survey of Teacher PhAKS fits this definition of an outlier, it was eliminated from the calculation of descriptive statistics.

Table 8

*Descriptive Statistics for the Survey of Teacher PhAKS Scores*

| | | |
|---|---|---|
| N | | 36 |
| Missing | | 1 |
| Mean | | 10.89 |
| Median | | 11.00 |
| Mode | | 11.00 |
| Std. Deviation | | 1.97 |
| Range | | 7.00 |
| Minimum Score | | 7.00 |
| Maximum Score | | 14.00 |
| Percentiles | 25 | 9.2500 |
| | 50 | 11.00 |
| | 75 | 12.75 |

*Note.* Calculated using SPSS software eliminating the one score of 3 as an outlier.

The average kindergarten teacher score or mean on the 15 item Survey of Teacher PhAKS Scores was 10.89 items correct. The scores ranged from seven to fourteen items correct with one outlier of three. The median score for kindergarten teachers was 11 questions correct. The most frequently occurring raw score or mode was 11 items correct.

The 25$^{th}$ percentile for the Survey of Teacher PhAKS was calculated at 9.25 and rounded to nine questions correct. The 50$^{th}$ percentile was calculated at 11 questions correct. The 75$^{th}$ percentile was calculated at 12.75 and rounded to 13 questions correct. The results indicate nine teachers scored at or below the 25$^{th}$ percentile. Five teachers scored in the range between 26% and 49%. Thirteen kindergarten teachers scored between the 50$^{th}$ percentile and the 74$^{th}$ percentile on the Survey of Teacher PhAKS. Nine kindergarten teachers scored at the 75$^{th}$ percentile or higher and no kindergarten teachers scored 100%.

Table 9

*Frequency of PhAKS Scores Represented as Percentages*

| Score | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| 7.00 | 2 | 5.4 | 5.6 |
| 8.00 | 3 | 8.1 | 13.9 |
| 9.00 | 4 | 10.8 | 25.0 |
| 10.00 | 5 | 13.5 | 38.9 |
| 11.00 | 8 | 21.6 | 61.1 |
| 12.00 | 5 | 13.5 | 75.0 |
| 13.00 | 6 | 16.2 | 91.7 |
| 14.00 | 3 | 8.1 | 100.0 |
| Missing | 1 | 2.7 | |
| Total | 37 | 100.0 | |

*Note.* Calculated using SPSS software eliminating the one score of 3 as an outlier.

The table above displays the frequency of each total raw score on the Survey of Teacher PhAKS. Once again the score of three was eliminated from calculations as an outlier. Along with the frequency of each score is the corresponding percentage followed by the cumulative percentage. The data can be interpreted as 5.4% of kindergarten teachers scored a raw score of seven on the Survey of Teacher PhAKS while 8.1% of kindergarten teachers scored an eight. Cumulatively, 13.9% of kindergarten teachers scored a seven or an eight on the Survey of Teacher PhAKS.

Table 10

*Responses by Kindergarten Teachers on the Survey of Teacher PhAKS*

| Question | # of Correct Responses | # of Incorrect Responses | Foil | # of Responses Choosing the Foil | Purpose of the Question |
|---|---|---|---|---|---|
| Q1 | 36 | 1 | a | 1 | |
| Q2 | 31 | 6 | a, b | 6 | |
| Q3 | 32 | 5 | a | 5 | Knowledge About Phonemic Awareness |
| Q4 | 25 | 12 | a | 12 | |
| Q5 | 31 | 6 | a | 2 | |
| Q6 | 17 | 18 | a | 12 | |
| Q7 | 35 | 2 | | | |
| Q8 | 4 | 33 | | | |
| Q9 | 36 | 1 | | | |
| Q10 | 35 | 2 | | | Ability to Identify and Match Phonemes in Words |
| Q11 | 20 | 17 | | | |
| Q12 | 31 | 6 | | | |
| Q13 | 32 | 5 | | | Ability to Count Phonemes in Written Words With Consonant Blends |
| Q14 | 19 | 18 | | | |
| Q15 | 18 | 19 | | | Ability to recognize what is left of a word after deleting an individual sound from that word |

*Note.* Question number six was skipped by two respondents and was not scored on those surveys.

The first nine questions assessed elements of the kindergarten teacher's knowledge about phonemic awareness. The first six items contained a foil which represented the connection between letters and the speech sounds used to read and spell. The foils contrasted with the phonemic awareness answers in the same questions which represented recognition and work with the sounds of spoken language.

Items one through four measured the kindergarten teacher's understanding of the definition and content related to phonemic awareness (Cheesman et al., 2009). Thirty-six kindergarten teachers responding to the Survey of Teacher PhAKS were able to answer the first question correctly. Thirty-one teachers responded to question number two correctly with the foil

chosen in each of the incorrect answers. Question number three was marked correctly by 32 teachers. The foil in question number three was chosen each time as the incorrect answer. Question number four was answered correctly by 25 kindergarten teachers with the foil being chosen each time as the incorrect answer.

Questions five through seven measured the respondent's ability to identify activities that related to phonemic awareness development (Cheesman et al., 2009). Question number five was answered correctly by thirty-one teachers, and the foil was chosen twice as the incorrect answer. Survey item six was answered correctly by 18 teachers. The foil was chosen 12 times as the incorrect answer. Item number six was skipped by two respondents and not counted as either correct or incorrect in the totals.

Question eight assessed the teacher's knowledge of task difficulty (Cheesman et al., 2009). Question number eight was answered correctly by four kindergarten teachers. Question nine addressed the student who would benefit from phonemic awareness instruction (Cheesman et al., 2009). Item number nine was answered correctly by 36 kindergarten teachers responding to the survey.

Questions 10, 11, and 12 assessed the respondent's ability to identify and match phonemes in written words (Cheesman et al., 2009). Question number 10 was answered correctly by 35 kindergarten teachers. Item number 11 was answered correctly by 20 teachers. Thirty-one teachers responded correctly to question number 12.

Items 13 and 14 addressed the kindergarten teacher's ability to count phonemes in written words with consonant blends (Cheesman et al., 2009). Thirty-two teachers answered question number 13 correctly. Question number 14 was answered correctly by 19 teachers.

Item 15 assessed the kindergarten teacher's ability to recognize what part remains in a word once an individual sound has been deleted (Cheesman et al., 2009). Eighteen kindergarten teachers answered item 15 correctly.

**Research Question #2: Kindergarten Teacher Demographic Data**

Demographic data was collected from kindergarten teachers in two areas. The first was the total number of years teaching. Teaching experience was requested from kindergarten teachers in time ranges as follows: (a) 1-2 years; (b) 3-5 years; (c) 6-10 years; (d) 11-20 years; and (e) 20+ years. These ranges were selected to align with the teacher development stages described by Block et al., (2002). Teacher development begins with the novice or beginner stage according to Block et al., (2002). The beginner stage, defined in this study, was the range of one to two years of teaching experience. During the second to third year of teaching, educators begin to develop additional strategic knowledge (Block et al., 2002). In this study, the three to five-year range was defined as the advanced beginner stage of teaching described by (Block et al., 2002). The third stage of teacher development labeled by Block et al., (2002) is competency. This study used the six to ten-year range to signify expected teaching competency. In stage four, teachers increase in proficiency (Block et al., 2002). The 11 to 20-year band represented proficiency in this study. The expert teacher exists in stage five (Block et al., 2002). This study utilized the 20+ band to represent the expert teacher according to years of experience. While experience in years alone does not guarantee skill development, teaching experience using both content and strategies would be expected to increase instructional skills in teachers to some degree. It is expected that a more experienced teacher would employ additional skills compared to a novice teacher.

Table 11

*Years of Teaching Experience*

| Years of Teaching | Number of Teachers | Teacher Development Stage |
|---|---|---|
| 1-2 Years | 3 | Novice |
| 3-5 Years | 8 | Advanced Beginner |
| 6-10 Years | 8 | Competent |
| 11-20 Years | 14 | Proficient |
| 20+ Years | 4 | Expert |
| | 37 Teachers | |

*Note.* Stages of teacher development adapted from Block et al., (2002).

The second aspect of demographic data collected from kindergarten teachers was the type of teaching degree held. Some kindergarten teachers held more than one degree. Kindergarten teachers responding to the survey individually held from one to three different educational degrees or endorsements. Each kindergarten teacher held an early childhood or elementary education degree. The four special education degrees were in addition to the other degrees. As a result, just the two categories of early childhood and elementary education were used. Thirty-seven teachers held a combination of 55 different degrees and endorsements.

Table 12

*Type of Degree Held by Teachers*

| Type of Degree Held | Number of Degrees |
|---|---|
| Early Childhood Education | 14 |
| Elementary | 33 |
| Special Education | 4 |
| Other | 4 |
| | Total 55 |

*Note.* Endorsements were included in the total number of degrees.

Included in the “other” category in the table above were two Master’s Degrees in Reading and Literacy, a Master’s Degree in Curriculum and Instruction, and an English Language Learner (ELL) endorsement.

**Research Question Number One: Teacher Knowledge of Phonemic Awareness**

To answer the second parts of both research questions one and two, ex post facto DIBELS data on first sound fluency was collected from the September, 2014 initial benchmark testing of new kindergarten students and the winter benchmark assessment in January, 2015. The DIBELS data was available as a numerical score and assigned to the following categories: well below benchmark, below benchmark, and at or above benchmark.

Table 13

*Paired Samples Correlations*

| Paired Samples Correlations | | | | |
|---|---|---|---|---|
| Matched Pairs | | N | Correlation | Significance |
| Pair 1 | Winter1A & Fall1A | 21 | .393 | .078 |
| Pair 2 | Winter1B & Fall1B | 18 | .403 | .097 |
| Pair 3 | Winter2A & Fall2A | 24 | .470 | .020 |
| Pair 4 | Winter2B & Fall2B | 24 | .646 | .001 |
| Pair 5 | Winter2C & Fall2C | 21 | .216 | .346 |
| Pair 6 | Winter2D & Fall2D | 20 | .579 | .008 |
| Pair 7 | Winter3A & Fall3A | 21 | .740 | .000 |
| Pair 8 | Winter3B & Fall3B | 22 | .539 | .010 |
| Pair 9 | Winter3C & Fall3C | 23 | .719 | .000 |
| Pair 10 | Winter3D & Fall3D | 21 | .480 | .028 |
| Pair 11 | Winter4A & Fall4A | 17 | .522 | .032 |
| Pair 12 | Winter4B & Fall4B | 18 | .534 | .022 |
| Pair 13 | Winter4C & Fall4C | 20 | .475 | .034 |
| Pair 14 | Winter4D & Fall4D | 19 | .656 | .002 |
| Pair 15 | Winter5A & Fall5A | 26 | .655 | .000 |
| Pair 16 | Winter5B & Fall5B | 22 | .316 | .151 |
| Pair 17 | Winter5C & Fall5C | 25 | .492 | .012 |
| Pair 18 | Winter6A & Fall6A | 19 | .473 | .041 |
| Pair 19 | Winter6B & Fall6B | 20 | .512 | .021 |
| Pair 20 | Winter6C & Fall6C | 18 | .783 | .000 |
| Pair 21 | Winter6D & Fall6D | 19 | .539 | .017 |
| Pair 22 | Winter7A & Fall7A | 21 | .616 | .003 |
| Pair 23 | Winter8A & Fall8A | 24 | .261 | .219 |
| Pair 24 | Winter9A & Fall9A | 20 | -.072 | .763 |

| | | | | |
|---|---|---|---|---|
| Pair 25 | Winter9B & Fall9B | 24 | .465 | .022 |
| Pair 26 | Winter10A & Fall10A | 20 | .710 | .000 |
| Pair 27 | Winter10B & Fall10B | 21 | .322 | .154 |
| Pair 28 | Winter11A & Fall11A | 24 | -.171 | .425 |
| Pair 29 | Winter11B & Fall11B | 23 | .233 | .284 |
| Pair 30 | Winter12A & Fall12A | 23 | .252 | .247 |
| Pair 31 | Winter12B & Fall12B | 22 | .511 | .015 |
| Pair 32 | Winter12C & Fall12C | 22 | .269 | .226 |
| Pair 33 | Winter13A & Fall13A | 25 | .482 | .015 |
| Pair 34 | Winter13B & Fall13B | 24 | .601 | .002 |
| Pair 35 | Winter13C & Fall13C | 22 | .536 | .010 |
| Pair 36 | Winter14A & Fall14A | 24 | .658 | .000 |
| Pair 37 | Winter14B & Fall14B | 24 | .491 | .015 |
| Pair 38 | Winter14C & Fall14C | 25 | .466 | .019 |
| Pair 39 | Winter15A & Fall15A | 16 | .727 | .001 |
| Pair 40 | Winter15B & Fall15B | 16 | .340 | .198 |
| Pair 41 | Winter16A & Fall16A | 16 | -.151 | .577 |
| Pair 42 | Winter16B & Fall16B | 20 | .379 | .099 |
| Pair 43 | Winter17A & Fall17A | 25 | .669 | .000 |
| Pair 44 | Winter17B & Fall17B | 22 | -.009 | .969 |
| Pair 45 | Winter17C & Fall17C | 26 | .397 | .045 |
| Pair 46 | Winter18A & Fall18A | 22 | .587 | .004 |
| Pair 47 | Winter18B & Fall18B | 21 | .497 | .022 |
| Pair 48 | Winter19A & Fall19A | 23 | .486 | .019 |
| Pair 49 | Winter19B & Fall19B | 24 | .562 | .004 |
| Pair 50 | Winter19C & Fall19C | 22 | .754 | .000 |
| Pair 51 | Winter20A & Fall20A | 18 | .075 | .769 |
| Pair 52 | Winter20B & Fall20B | 18 | -.025 | .922 |
| Pair 53 | Winter20C & Fall20C | 21 | .318 | .160 |
| Pair 54 | Winter20D & Fall20D | 20 | .323 | .165 |
| Pair 55 | Winter21A & Fall21A | 21 | .604 | .004 |
| Pair 56 | Winter21B & Fall21B | 21 | .455 | .038 |
| Pair 57 | Winter21C & Fall21C | 18 | .748 | .000 |

*Note.* Each matched pair corresponds to a teacher's fall and winter DIBELS scores.

Table 14

*Paired Samples Mean Differences*

| | Matched Pairs | Mean Difference | Standard Deviation | Standard Error Mean |
|---|---|---|---|---|
| Pair 1 | Winter1A - Fall1A | 30.048 | 11.417 | 2.491 |
| Pair 2 | Winter1B - Fall1B | 28.833 | 13.196 | 3.110 |
| Pair 3 | Winter2A - Fall2A | 28.917 | 10.579 | 2.159 |
| Pair 4 | Winter2B - Fall2B | 21.500 | 8.204 | 1.675 |
| Pair 5 | Winter2C - Fall2C | 21.143 | 12.167 | 2.655 |
| Pair 6 | Winter2D - Fall2D | 26.050 | 12.155 | 2.718 |
| Pair 7 | Winter3A - Fall3A | 18.333 | 6.916 | 1.509 |
| Pair 8 | Winter3B - Fall3B | 18.136 | 10.339 | 2.204 |
| Pair 9 | Winter3C - Fall3C | 17.565 | 10.220 | 2.131 |
| Pair 10 | Winter3D - Fall3D | 19.619 | 8.732 | 1.905 |
| Pair 11 | Winter4A - Fall4A | 25.647 | 12.145 | 2.946 |
| Pair 12 | Winter4B - Fall4B | 33.722 | 12.583 | 2.966 |
| Pair 13 | Winter4C - Fall4C | 34.950 | 11.283 | 2.523 |
| Pair 14 | Winter4D - Fall4D | 32.632 | 10.802 | 2.478 |
| Pair 15 | Winter5A - Fall5A | 35.731 | 9.833 | 1.928 |
| Pair 16 | Winter5B - Fall5B | 34.273 | 12.495 | 2.664 |
| Pair 17 | Winter5C - Fall5C | 32.120 | 10.337 | 2.067 |
| Pair 18 | Winter6A - Fall6A | 28.211 | 12.200 | 2.799 |
| Pair 19 | Winter6B - Fall6B | 22.550 | 12.081 | 2.701 |
| Pair 20 | Winter6C - Fall6C | 16.667 | 9.953 | 2.346 |
| Pair 21 | Winter6D - Fall6D | 26.421 | 12.217 | 2.803 |
| Pair 22 | Winter7A - Fall7A | 31.333 | 11.821 | 2.580 |
| Pair 23 | Winter8A - Fall8A | 30.875 | 10.824 | 2.209 |
| Pair 24 | Winter9A - Fall9A | 27.300 | 15.587 | 3.485 |
| Pair 25 | Winter9B - Fall9B | 25.250 | 11.763 | 2.401 |
| Pair 26 | Winter10A - Fall10A | 17.550 | 12.037 | 2.692 |
| Pair 27 | Winter10B - Fall10B | 25.095 | 11.679 | 2.548 |
| Pair 28 | Winter11A - Fall11A | 29.125 | 13.690 | 2.794 |
| Pair 29 | Winter11B - Fall11B | 34.174 | 9.866 | 2.057 |
| Pair 30 | Winter12A - Fall12A | 23.043 | 13.936 | 2.906 |
| Pair 31 | Winter12B - Fall12B | 27.409 | 11.194 | 2.387 |
| Pair 32 | Winter12C - Fall12C | 23.636 | 11.000 | 2.345 |
| Pair 33 | Winter13A - Fall13A | 22.640 | 11.891 | 2.378 |
| Pair 34 | Winter13B - Fall13B | 18.792 | 11.872 | 2.423 |

| | | | | |
|---|---|---|---|---|
| Pair 35 | Winter13C - Fall13C | 24.045 | 13.418 | 2.861 |
| Pair 36 | Winter14A - Fall14A | 21.167 | 12.744 | 2.601 |
| Pair 37 | Winter14B - Fall14B | 26.333 | 11.111 | 2.268 |
| Pair 38 | Winter14C - Fall14C | 25.080 | 10.673 | 2.135 |
| Pair 39 | Winter15A - Fall15A | 34.875 | 7.473 | 1.868 |
| Pair 40 | Winter15B - Fall15B | 27.125 | 10.327 | 2.582 |
| Pair 41 | Winter16A - Fall16A | 26.625 | 12.638 | 3.159 |
| Pair 42 | Winter16B - Fall16B | 27.800 | 11.696 | 2.615 |
| Pair 43 | Winter17A - Fall17A | 22.040 | 8.853 | 1.771 |
| Pair 44 | Winter17B - Fall17B | 23.455 | 13.280 | 2.831 |
| Pair 45 | Winter17C - Fall17C | 16.615 | 12.436 | 2.439 |
| Pair 46 | Winter18A - Fall18A | 21.773 | 9.666 | 2.061 |
| Pair 47 | Winter18B - Fall18B | 25.000 | 12.385 | 2.703 |
| Pair 48 | Winter19A - Fall19A | 25.391 | 14.628 | 3.050 |
| Pair 49 | Winter19B - Fall19B | 25.208 | 12.162 | 2.483 |
| Pair 50 | Winter19C - Fall19C | 32.091 | 7.470 | 1.593 |
| Pair 51 | Winter20A - Fall20A | 35.389 | 14.038 | 3.309 |
| Pair 52 | Winter20B - Fall20B | 31.500 | 14.581 | 3.437 |
| Pair 53 | Winter20C - Fall20C | 33.000 | 12.566 | 2.742 |
| Pair 54 | Winter20D - Fall20D | 24.700 | 14.636 | 3.273 |
| Pair 55 | Winter21A - Fall21A | 31.619 | 10.495 | 2.290 |
| Pair 56 | Winter21B - Fall21B | 33.333 | 11.723 | 2.558 |
| Pair 57 | Winter21C - Fall21C | 15.000 | 9.542 | 2.249 |

*Note.* Each matched pair corresponds to a teacher's fall and winter DIBELS scores.

Table 15

*Descriptive Statistics for Matched Data Pairs*

| Descriptive Statistics For Matched Data Pairs | | | | | | |
|---|---|---|---|---|---|---|
| | N | Range | Minimum | Maximum | Mean | Variance |
| Mean Differences | 57 | 21 | 15 | 36 | 26.31 | 31.14 |

*Note.* Calculated using SPSS software.

Each kindergarten teacher's student DIBELS scores were analyzed using SPSS software to determine the mean for the fall student DIBELS scores and the mean for the winter student DIBELS scores. For each classroom teacher, the difference in the means was calculated to demonstrate the growth in student scores as measured by the DIBELS assessment. In the 57

matched pairs of student data, the range of the classroom mean scores was 21 points. The minimum growth in one kindergarten classroom was 15 points between the two data points while the highest growth was 36 points in another classroom. The overall average growth in DIBELS scores for all the kindergarten classes was 26.31 points. The variance of the scores was calculated at 31.14.

Table 16

*Correlation between Average Student Growth and Teacher Scores on PhAKS*

Correlations

| | | score | growth |
|---|---|---|---|
| score | Pearson Correlation | 1 | .031 |
| | Sig. (2-tailed) | | .855 |
| | N | 37 | 37 |
| growth | Pearson Correlation | .031 | 1 |
| | Sig. (2-tailed) | .855 | |
| | N | 37 | 37 |

*Note.* Correlation calculated using SPSS software.

A Pearson *r* was calculated investigating the relationship between the mean growth from the fall to winter DIBELS student scores, and the corresponding kindergarten teachers score on the Survey of Teacher PhAKS. The correlation matrix shown in Table 16 illustrates the two variables. Because any variable is perfectly correlated with itself, the *score x score* and the *growth x growth* each equal 1.0 (Tanner, 2012). The upper right section of the matrix shows the correlation of kindergarten teacher score on the PhAKS with student growth on the DIBELS assessment. The lower half of the matrix shows the correlation in reverse. The first line shows a correlation coefficient of .031. A correlation of 0 to .3 would be considered weak and a .3 to .7 moderate (Tanner, 2012). A correlation of 7 and higher is considered high (Tanner, 2012). The

second number of .855 indicates the probability that the correlation happened by chance. A *p-value* equal to or less than .05 would be considered significant.

**Research Question Number Two: Teacher Experience and Type of Degree**

The analysis of variance of ANOVA allows comparison of any number of groups, and using one test, determines whether there are significant differences between the groups (Tanner, 2012). In this study the independent variables are kindergarten teaching experience and type of teaching degree held while the dependent variable is the kindergarten teacher's score on the PhAKS. Kindergarten teaching experience was categorized for SPSS analysis in five ways: a) the number 1 signifies 1-2 years of teaching experience; b) the number 2 represents 3-5 years of experience; c) the number 3 represents 6-10 years of experience; d) the number 4 equals 11-20 years of experience; and e) the number 5 signifies 20 plus years of teaching experience.

ANOVA descriptive calculations using SPSS software show teachers in category one or with 1-2 years of teaching experience having the highest mean scores for the Survey of Teacher PhAKS. Teachers in category two with 3-5 years of teaching experience have the lowest mean score for the Survey of Teacher PhAKS.

Fourteen kindergarten teachers were in category four having 11-20 years of teaching experience. Two categories had eight kindergarten teachers each. These were teachers with 3-5 years of experience and teachers with 6-10 years of experience. Category four with teachers having 11-20 years of experience had the greatest range in the Survey of Teacher PhAKS scores. Even when removing the outlier score of three, the range was seven.

Table 17

*ANOVA Descriptives for Teacher PhAKS Scores and Teaching Experience*

| Descriptives | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Score | | | | | | | | |
| | | | | | 95% Confidence Interval for Mean | | | |
| | N | Mean | Std. Deviation | Std. Error | Lower Bound | Upper Bound | Minimum | Maximum |
| 1 | 3 | 11.67 | 3.215 | 1.856 | 3.68 | 19.65 | 8 | 14 |
| 2 | 8 | 10.13 | 2.357 | .833 | 8.15 | 12.10 | 7 | 13 |
| 3 | 8 | 11.63 | 1.061 | .375 | 10.74 | 12.51 | 11 | 14 |
| 4 | 14 | 10.21 | 2.833 | .757 | 8.58 | 11.85 | 3 | 14 |
| 5 | 4 | 10.75 | 1.708 | .854 | 8.03 | 13.47 | 9 | 13 |
| Total | 37 | 10.68 | 2.334 | .384 | 9.90 | 11.45 | 3 | 14 |

*Note.* Calculated using SPSS software and five categories of teaching experience.

Table 18

*ANOVA for Kindergarten Teacher PhAKS Scores and Teaching Experience*

| ANOVA | | | | | |
|---|---|---|---|---|---|
| Score | | | | | |
| | Sum of Squares | df | Mean Square | F | Sig. |
| Between Groups | 22.978 | 4 | 5.745 | 1.841 | .152 |
| Within Groups | 77.989 | 25 | 3.120 | | |
| Total | 100.967 | 29 | | | |

*Note.* ANOVA calculated using SPSS software.

The ANOVA results for kindergarten teacher PhAKS scores and years of teaching experience yielded .152 as a significance value. A *p* value of .05 or greater would be considered significant. The significance value of .152 is greater than .05 indicating that there was no significant difference in the values. We can conclude that the difference in means is likely due to chance or some other variable other than teaching experience.

Table 19

*Descriptive Statistics for Between-Subjects Effects*

| Descriptive Statistics | | | | |
|---|---|---|---|---|
| Dependent Variable: Score | | | | |
| Experience | Degree | Mean | Std. Deviation | N |
| 1 | 2 | 11.67 | 3.215 | 3 |
| | Total | 11.67 | 3.215 | 3 |
| 2 | 1 | 9.00 | 1.414 | 2 |
| | 2 | 10.50 | 2.588 | 6 |
| | Total | 10.13 | 2.357 | 8 |
| 3 | 1 | 12.33 | 1.528 | 3 |
| | 2 | 11.20 | .447 | 5 |
| | Total | 11.63 | 1.061 | 8 |
| 4 | 1 | 10.67 | 2.422 | 6 |
| | 2 | 9.87 | 3.227 | 8 |
| | Total | 10.21 | 2.833 | 14 |
| 5 | 1 | 9.50 | .707 | 2 |
| | 2 | 12.00 | 1.414 | 2 |
| | Total | 10.75 | 1.708 | 4 |
| Total | 1 | 10.62 | 2.103 | 13 |
| | 2 | 10.71 | 2.493 | 24 |
| | Total | 10.68 | 2.334 | 37 |

*Note.* Calculated using SPSS.

The table above illustrates the descriptive statistics for years of teaching experience and type of degree held by the kindergarten teachers aligned to the corresponding mean for the raw scores on the Survey of Teacher PhAKS. A number one in the table under the “degree” heading represents an early childhood education degree while a two signifies a general elementary education degree. Ten kindergarten teachers held combined early childhood and elementary education degrees. These kindergarten teachers were placed in the early childhood education group. The rationale for this decision was based on an early childhood degree being more focused on preschool through kindergarten development.

The poorest performing kindergarten teacher group on the Survey of Teacher PhAKS could be described as teachers with three to five years of experience holding early childhood education degrees. This group of kindergarten teachers had a mean score of nine on the Survey of Teacher PhAKS. The highest performing kindergarten group had a mean score of 12.33 on the Survey of Teacher PhAKS. This group of kindergarten teachers has 6-10 years of experience and early childhood teaching degrees. Another group of kindergarten teachers has a mean score of 12 on the Survey of Teacher PhAKS. This group had over 20 years of teaching experience and held general elementary education degrees.

Table 20

*Tests of Between-Subjects Effects*

| Tests of Between-Subjects Effects | | | | | |
|---|---|---|---|---|---|
| Dependent Variable: Score | | | | | |
| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
| Corrected Model | 29.766[a] | 8 | 3.721 | .626 | .749 |
| Intercept | 3055.538 | 1 | 3055.538 | 514.333 | .000 |
| Experience | 18.017 | 4 | 4.504 | .758 | .561 |
| Degree | 1.728 | 1 | 1.728 | .291 | .594 |
| Experience * Degree | 14.181 | 3 | 4.727 | .796 | .507 |
| Error | 166.342 | 28 | 5.941 | | |
| Total | 4413.000 | 37 | | | |
| Corrected Total | 196.108 | 36 | | | |

*Note*. a. R Squared = .152 (Adjusted R Squared = -.091)

A significance or *p* value less than .05 would indicate significance. The *p* value for teaching experience and type of degree held by the kindergarten teacher are each greater than the .05 value. These larger values represent no significant interaction between the variables.

## Conclusion

In Chapter IV, data sources were analyzed to answer the two research questions in this study. The strength of this research study was the process of collecting and analyzing data from multiple sources. The data sources for the first research question included ex-post facto student DIBELS assessment data and kindergarten teacher knowledge of phonemic awareness using the Survey of Teacher PhAKS. The kindergarten teacher demographic data and the ex-post facto student DIBELS assessment data were the data sources for the second research question. The focus of Chapter IV was to summarize the findings of the quantitative data collected.

Chapter V will describe the findings of this study in more detail while offering possible interpretation to the data provided in this chapter.

# Chapter V

# Discussion

## Introduction

The goal of this chapter is to discuss the results of this study. The discussion of the study includes a synopsis of the problem, the purpose of the study, the research questions guiding the research, and major findings. Any inconsistencies in the results are identified along with any limitations in the study. The chapter concludes with a recommendations for further research, implications for our professional practice, and a final reflective summary.

## Synopsis of the Problem

Research has focused on the acquisition of reading in young children for decades and the role of phonological awareness as a critical piece in reading development has been clearly identified. Phonological awareness, including phonemic awareness, is recognized as a predictor of early reading proficiency (Ouellette & Haley, 2013). Students enter kindergarten with a broad range of readiness to learn experiences and academic skills. As a result, opportunity gaps appear quickly in students of poverty, students with disabilities, and with English Language Learners.

Often early childhood educators lack the basic understanding phonological awareness and how to foster phonemic awareness growth in their young students (Martinussen et al., 2015; Moats & Foorman, 2003; Phillips et al., 2008). If early childhood educators do lack basic understanding of phonological awareness, it might be assumed that teachers with low phonemic awareness knowledge would, in turn, have students who were low performers on phonemic awareness measures. While the need for phonemic awareness skills in early reading acquisition is clear, the role of teacher knowledge of phonemic awareness plays is not. This research

attempted to define better the role of kindergarten teacher knowledge of phonemic awareness and its impact on kindergarten student achievement.

**Purpose of the Study**

This study investigated the belief that knowledgeable teachers make the difference in classroom instruction. It is reasonable to believe that the knowledge level of classroom teachers impacts the learning of their students. This statement, however, is not as crystal clear as one might think. There are a multitude of factors which impact a student's ability to learn and a teacher's ability to teach. This study used quantitative methods to investigate the relationship between kindergarten teacher knowledge of phonemic awareness and kindergarten student performance in phonemic awareness. The research questions specifically addressed in the study were:

1. What is the relationship between kindergarten teacher knowledge of phonemic awareness and developing phonemic awareness skills in kindergarten students as measured by the Survey of Teacher PhAKS (Phonemic Awareness, Knowledge, and Skills) and the Dynamic Indicators of Basic Early Literacy Skills (DIBELS Next Edition) Assessment?
2. What is the relationship between kindergarten teacher knowledge of phonemic awareness as measured by the Survey of Teacher PhAKS (Phonemic Awareness, Knowledge, and Skills) and years of teaching and type of degree held by the teacher?

**Major Findings**

The Survey of Teacher PhAKS (Phonemic Awareness, Knowledge, and Skills) developed by Elaine Cheesman (2009) was sent to 57 kindergarten teachers. The purpose of this measurement tool was an assessment of the kindergarten teacher's knowledge of phonemic

awareness. The Survey of Teacher PhAKS was scored for accuracy with the mode score an 11. The range of scores was from three questions correct to 14 questions correct. No kindergarten teacher had a perfect score of 15. The mean score was 10.89 after removing the score of three as an outlier. Nine kindergarten teachers or 26% of the kindergarten teacher respondents scored below the 25$^{th}$ percentile. Another 12 kindergarten teachers (34%) scored between the 26$^{th}$ and 50$^{th}$ percentiles on the Survey of Teacher PhAKS. Sixty percent of kindergarten teachers scored below the 50$^{th}$ percentile on the Survey of Teacher PhAKS. Eleven kindergarten teachers (31%) scored between the 51$^{st}$ percentile and the 75$^{th}$ percentile on the assessment while three (9%) kindergarten teachers scored above the 75$^{th}$ percentile on the measurement of phonemic awareness. No kindergarten teacher had a perfect score on the Survey of Teacher PhAKS.

Closer analysis of the questions and responses on the Survey of Teacher PhAKS demonstrated confusion between phonemic awareness which is the recognition of sounds in spoken language and phonics the speech sounds used in reading and spelling. The first six questions tested the kindergarten teacher's knowledge about phonemic awareness with a foil in the first six questions containing a response better suited for phonics. When kindergarten teachers answered incorrectly on question one to four, they selected the phonics foil 100% of the time as the incorrect answer. Kindergarten teachers selected the phonics foil one-third of the time for question five and two-thirds of the time for question six.

Table 21

*Responses by Kindergarten Teachers on Questions 1-9 on the Survey of Teacher PhAKS*

| Question | # of Correct Responses | % Correct | # of Incorrect Responses | Foil | # of Responses Choosing the Foil | % Foil Chosen | Purpose of the Question |
|---|---|---|---|---|---|---|---|
| Q1 | 36 | 97 | 1 | a | 1 | 100 | |
| Q2 | 31 | 84 | 6 | a, b | 6 | 100 | Questions 1-4 "understanding the definition and content related to phonemic awareness" |
| Q3 | 32 | 87 | 5 | a | 5 | 100 | |
| Q4 | 25 | 68 | 12 | a | 12 | 100 | |
| Q5 | 31 | 84 | 6 | a | 2 | 33 | Questions 5-7 "ability to identify activities that develop phonemic awareness" |
| Q6 | 17 | 46 | 18 | a | 12 | 67 | |
| Q7 | 35 | 95 | 2 | | | | |
| Q8 | 4 | 11 | 33 | | | | Question #8 "understanding of task difficulty" |
| Q9 | 36 | 97 | 1 | | | | Question #9 "concerns the type of student phonemic awareness instruction potentially benefits |

*Note.* Question number six was skipped by two respondents and was not scored on those surveys.

In the educational setting, 80% is considered mastery of a skill. Table 20 illustrates the first six questions on the Survey of Teacher PhAKS. Kindergarten teachers demonstrated mastery on questions number one and number three, but lower mastery at 84% on questions two and five. Question number two asked kindergarten teachers to define phonemic awareness. While 84% of kindergarten teachers were able to identify phonemic awareness as the ability to work with the individual sounds in spoken words, 16% of the teachers responded phonics or the relationship between letters and sounds. Question number five asked kindergarten teachers to

identify an activity related to phonemic awareness instruction. Again, 16% of kindergarten teachers responded one-third of the time with a phonics related answer of coloring a picture that begins with a particular letter *(b).*

Questions four and six were problematic for kindergarten teachers. Question number four required kindergarten teachers to identify a phonemic awareness lesson. Sixty-eight percent of kindergarten teachers answered this question correctly while 12 kindergarten teachers chose the phonics foil, *learning letter-sound relationships,* 100% of the time. Question number six asked kindergarten teachers for an example of explicit phonemic awareness instruction. Forty-six percent of kindergarten teachers answered this question correctly. Once again, the phonics foil was chosen 67% of the time as an incorrect answer.

Questions seven through nine also assessed the kindergarten teacher's general knowledge of phonemic awareness, but without a phonics foil. Kindergarten teachers demonstrated mastery on both questions seven and nine; however, question number eight proved to be the most difficult on the assessment. Only four (11%) kindergarten teachers scored correctly on question number eight which required kindergarten teachers to select the task demonstrating more refined phonemic awareness skill. Kindergarten teachers were split in their incorrect responses between the identifying the first sound in the word *siedl* and the word *shed* being of equal difficulty and */sh/* in *shed* being more difficult to identify.

Table 22

*Responses by Kindergarten Teachers on Questions 10-12 on the Survey of Teacher PhAKS*

| Question | # of Correct Responses | % Correct | # of Incorrect Responses | Purpose of the Question |
|---|---|---|---|---|
| Q10 | 35 | 95 | 2 | Ability to Identify and Match Phonemes in Words |
| Q11 | 20 | 54 | 17 | |
| Q12 | 31 | 84 | 6 | |

*Note.* Question number six was skipped by two respondents and was not scored on those surveys.

Question number 11 proved difficult for kindergarten teachers with 54% accuracy on the Survey of Teacher PhAKS. Kindergarten teachers were asked to match two words with the same final sound. Seventy-seven percent of kindergarten teachers chose *(b) house-hose* as the incorrect answer rather than the correct answer *please-buzz*. Of interest is the possibility that kindergarten teachers selected the answer that visually had the same spelling of the */s/* sound instead of the correct */se/ and /zz/* used to represent the oral /z/ sound in the question.

Table 23

*Responses by Kindergarten Teachers on Questions 13-15 on the Survey of Teacher PhAKS*

| Question | # of Correct Responses | % Correct | # of Incorrect Responses | Purpose of the Question |
|---|---|---|---|---|
| Q13 | 32 | 87 | 5 | Ability to Count Phonemes in Written Words with Consonant Blends |
| Q14 | 19 | 51 | 18 | |
| Q15 | 18 | 49 | 19 | Ability to recognize what is left of a word after deleting an individual sound from that word |

*Note.* Question number six was skipped by two respondents and was not scored on those surveys.

Question 14 was answered 51% of the time correctly on the Survey of Teacher PhAKS. Kindergarten teachers were asked to identify which list of words represented a systematic sequence in counting sounds in words. Kindergarten teachers appeared to have difficulty recognizing a blend */fl/*, */br/* has two sounds while a digraph */sh/* has one sound.

Kindergarten teachers responded correctly to the last item on the Survey of Teacher PhAKS 49% of the time. Item 15 tested the kindergarten teacher's ability to recognize what is left of a word after deleting an individual sound from that word. Given the word, */mixed/* and asked to remove the */k/* sound, kindergarten teachers often chose the word /mid/ instead of the correct answer */mist/*. This answer may have been chosen by kindergarten teachers based on the visual representation when the */xe/* are removed from the spelling of */mixed/*.

Overall, 14 kindergarten teachers or 38% demonstrated mastery of the 15 item Survey of Teacher PhAKS. The scores demonstrated a lack of knowledge by kindergarten teachers in each of the subsections except for one which concerned the type of student phonemic awareness instruction potentially benefits.

Ex-post facto kindergarten student scores from the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) were analyzed in matched pairs using fall and winter data from the *first sound fluency* measurement. The mean growth for each pair was calculated along with the average mean for all the student data pairs. The point totals represent the growth of students in their DIBELS scores. The mean for the group was 26.31 points, so the highest student average score represents ten points higher than the overall average. The low student average score of 15 represents 21 points lower than the overall average student growth.

A Pearson *r* correlation conducted using the kindergarten teacher's scores on the Survey of Teacher PhAKS and the mean growth of their student DIBELS scores indicated a correlation coefficient of .031 which is considered weak. A significance score of .855 is considered not significant which suggests the probability that the correlation happened by chance. These results further suggest that the kindergarten teacher's knowledge of phonemic awareness did not significantly impact their students' scores on the DIBELS assessment.

Demographic data was collected from kindergarten teachers in two categories, years of teaching and type of degree held. The teaching experience time bands used in this study align with the following terms: (a) novice/beginner, (b) advanced beginner, (c) competent, (d) proficient, and (e) expert.

Table 24

*Years of Teaching Experience Represented in Percentages*

| Years of Teaching | Number of Teachers | % of Kindergarten Teachers | Teacher Development Stage |
|---|---|---|---|
| 1-2 Years | 3 | 8 | Novice |
| 3-5 Years | 8 | 22 | Advanced Beginner |
| 6-10 Years | 8 | 22 | Competent |
| 11-20 Years | 14 | 38 | Proficient |
| 20+ Years | 4 | 11 | Expert |
| | 37 Teachers | | |

*Note.* Stages of teacher development adapted from Block et al., (2002). Percentages rounded to whole numbers.

In this study, 38% were in what would be considered the proficient range with 11 to 20 years of teaching experience. Twenty-two percent of the kindergarten teachers responding were in the advanced beginner and competent ranges of teaching experience. Lesser totals of kindergarten teachers were on the low and high end of teaching experience. Eight percent of kindergarten teacher were novice teachers, and 11 percent were in the expert range with over twenty years of experience.

**Conclusion**

The theoretical framework, based on the research of Elaine Cheesman (2009) and Linnea Ehri (2002, 2004), supported this study. The theoretical framework clarified the relationship between teacher knowledge of phonemic awareness and student acquisition of reading skills illustrated through Ehri's *Phase Theory*. Original research by Cheesman et al. (2009) was supported by this study's findings, indicating poor performance by kindergarten teachers on

phonemic awareness measured by the Survey of Teacher PhAKS. The relationship between the lack of knowledge of phonemic awareness in kindergarten teachers and student performance in phonemic awareness remains unclear.

**Research Question Number One**

The relationship between kindergarten teacher knowledge of phonemic awareness and developing phonemic awareness skills in kindergarten students is unclear. Seventy-one percent of kindergarten teachers in this study had from six years to 20 plus years of teaching experience placing them in what would be considered competent to the expert range; however, the 37 participating kindergarten teachers demonstrated an overall lack of deep knowledge about phonemic awareness.

In this study, 38% of kindergarten teachers demonstrated what would be considered mastery of phonemic awareness. In fact, sixty percent of kindergarten teachers scored below the $50^{th}$ percentile on the Survey of Teacher PhAKS. Kindergarten teachers were particularly confused by the phonics foils in questions number 1-6 on the Survey of Teacher PhAKS. These answers represented phonics, the relationship between letters and their sounds, and were chosen most often as the incorrect answer. When kindergarten teachers answered incorrectly on questions one through four on the Survey of Teacher PhAKS, the phonics foil was chosen 100% of the time as the incorrect answer.

Kindergarten teachers also had difficulty noting the difference between digraphs such as the */sh/* which represent one sound and blends */gr/* which represent two sounds. Also, some incorrect answers by kindergarten teachers appeared to be a result of spelling miscues provided in the incorrect answers such as /*house-hose/* instead of the correct answer /*please-buzz/.*

The range of kindergarten student scores as measured by the DIBELS *First Sound Fluency* assessment was quite large between the kindergarten classes with a low mean growth of 15 points and a high mean growth of 36 points. While this is a sizable variance of 31.135 points between low and high performing students on the DIBELS measure, there was no significant relationship found between teacher knowledge of phonemic awareness and student growth on the DIBELS measure. It remains unclear why kindergarten student DIBELS scores were so varied.

**Research Question Number Two**

This study investigated whether teacher experience or the type of degree held by the kindergarten teacher would be a factor in their kindergarten students' knowledge of phonemic awareness as measured by the DIBELS *First Sound Fluency* measure. The researcher sought to identify a kindergarten teacher profile that aligned with positive growth in their kindergarten students phonemic awareness skills. The goal would be to replicate that profile, therefore, increasing student performance. There were no significant relationships found between student growth on the DIBELS *First Sound Fluency* measure and either teaching experience or type of degree held by the kindergarten teacher.

**Impact of Limitations**

This study was conducted using one district's student and teacher data. A larger sample size across additional districts and geographical areas may result in different results.

One delimitating factor in this study was the use of the *First Sound Fluency* measure in the DIBELS assessment. The *First Sound Fluency* measure is one small portion of an overall assessment of a kindergarten student's phonemic awareness knowledge. It is administered formally as a benchmark assessment twice each year in the fall and winter to kindergarten

students. It is difficult to view the entire kindergarten student growth profile for the year using just this particular measure because it is dropped after the winter benchmark assessment period.

**Recommendations for Future Research**

This study raised additional questions as a result of the data collected. No clear teacher profile existed in relationship to kindergarten student achievement on the DIBELS. Of particular interest is the role played by the reading curriculum utilized by kindergarten teachers in the kindergarten classrooms. The district participating in this study was in its second year of implementing all full-day kindergarten classrooms. One must ask if the extended day allowed for additional time to be spent using the adopted curriculum materials. Additional research correlating the teacher's use of the district adopted reading curriculum with fidelity and their student growth scores is warranted. Because the district adopted kindergarten curriculum materials include a strong phonemic awareness element, there may be a relationship between curriculum use and student achievement. An extension of this research may be to what extent the kindergarten teacher extends or supplements the regular reading curriculum with other materials. If so, what are these materials and is the relationship a positive one?

Another area of interest is the kindergarten student profile. If the teacher's experience and knowledge level are not significant factors in relationship to student learning, then the student's starting point in learning may be even more critical. Perhaps an essential precursor to phonemic awareness, such as oral language development, is less established in some kindergarten students. This topic also warrants further research especially in relationship to preschool programs.

## Implications for Professional Practice

This research illustrates a need for professional development for kindergarten teachers in the subskills of reading acquisition, and in particular, phonemic awareness. Many of the current basal series include a strong phonemic awareness strand. However, it is clear that the majority of kindergarten teachers in this study do not possess a fundamental knowledge of phonemic awareness nor understand its critical role in reading acquisition. Kindergarten teachers lacking knowledge about phonemic awareness might be less likely to use or follow the adopted curriculum with fidelity.

Evidence exists that teacher candidates can increase their knowledge of phonemic awareness in a brief timeframe following the explicit instruction of phonemic awareness concepts (Martinussen et al., 2015). Professional development provided during the reading adoption process may need to be replicated or reviewed for current kindergarten teachers so that curriculum materials are used with fidelity thus embedding phonemic awareness instruction into each day's activities.

## Final Reflection

Kindergarten students who perform below standard in reading, and in particular in phonological skills rarely close this learning gap (Hurford et al., 1994; Kaminski & Good III, 2011). These students usually continue to struggle with reading throughout their school careers without specific intervention. This study found a variance in kindergarten student scores as measured by the *First Sound Fluency* measure of the DIBELS. This study sought to find a reason this achievement gap exists.

Kindergarten teachers in the current study were confused by differences between definitions of phonological awareness and phonics as also suggested by Cheesman et al. (2009)

and Walsh (2009). An increasing, yet still small body of evidence suggests teachers knowledgeable in phonological awareness can have a positive impact on student learning. While this study did not find a significant relationship between teacher knowledge of phonemic awareness and student achievement, one must wonder about the role the curriculum plays in the dynamic of learning. If teacher knowledge is not a key factor in student learning as this study suggests, then the use of a strong phonemic awareness curriculum adds another variable to the overall relationship between teacher knowledge and student achievement.

By correlating teacher demographic data with teacher knowledge of phonemic awareness, this researcher sought to identify successful kindergarten teacher profiles measured by kindergarten student achievement. While no clear teacher profile patterns emerged from this study, it is still believed by this researcher that key factors do exist. Educators must understand the barriers that impede phonemic awareness development in young children. Equipped with this understanding, administrators and teachers can support parents and preschool teachers with suggestions and models for early phonemic awareness development. Reading remains critical to personal and professional success, so educators must continue to seek answers to these questions.

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# Appendix A

## Permission to Use PhAKS Survey Tool

Hello,

It is my pleasure to give you permission to use my instrument.

Elaine Cheesman

On Jan 21, 2015, at 10:05 PM, Harris, Dana M. <HarrisDM@puyallup.k12.wa.us<mailto:HarrisDM@puyallup.k12.wa.us>> wrote:

Dear Dr. Cheesman,

My name is Dana Harris and I am currently in a Doctorate Program through Northwest Nazarene University. I am doing research in the area of teacher knowledge of phonemic awareness and reading achievement in kindergarten within [redacted] in Washington State.

I am seeking permission to use the Survey of Teacher PhAKS (Phonemic Awareness Knowledge and Skills) measure you created as part of my data collection process.

With your permission, I would be happy to share my results with you upon completion of my research. I would also credit you within my documents and dissertation.

Thank you for considering my request,

Dana

---

Dana Harris
Director for Instructional Support
Puyallup School District

## Appendix B

### Survey of Teacher PhAKS (Phonemic Awareness Knowledge and Skills)

*Survey of Teacher PhAKS (Phonemic Awareness, Knowledge, and Skills)*

1. A phoneme is

(a) *the smallest part of written language*
**(b) the smallest part of spoken language**
(c) a word part that contains a vowel sound
(d) I'm not sure

2. Phonemic awareness is

(a) *the same thing as phonics*
(b) *understanding the relationships between letters and the sounds they represent*
(c) **the ability to identify and work with the individual sounds in spoken words**
(d) I'm not sure

3. Effective phonemic awareness instruction teaches children to

(a) *convert letters or letter combinations into sounds*
(b) **notice, think about, and work with sounds in spoken language**
(c) discriminate one letter from the other letters of the alphabet
(d) I'm not sure

4. The student's first lessons in phonemic awareness involve

(a) *learning letter-sound relationships*
(b) matching spoken words with printed words
(c) **identifying sounds shared among words**
(d) I'm not sure

5. A student has broad phonological awareness and now needs explicit phonemic awareness instruction. What type of activity focuses on phonemic awareness skills?

(a) *Color the pictures that begin with the letter b*
(b) Count the syllables in the word *hotdog*
(c) **Count the sounds in the word** *cake*
(d) I'm not sure

6. An example of explicit phonemic awareness instruction is

(a) *teaching letter-sound correspondences*
(b) **choosing the word in a set of four words that has the "odd" sound**
(c) reading words in the same word family, e.g., *at, sat, mat, cat*
(d) I'm not sure

7. Which activity explicitly links spelling with phonemic awareness?

(a) Make as many words as you can using only the letters *p, a, s, I*
(b) Say a word, then name the letters out loud; write the word
(c) **Say a word, then tap out the sounds in the word; write the letters for these sounds**
(d) I'm not sure

8. Which task requires more refined phonemic awareness?

(a) **What is the first sound in *siedl***
(b) What is the first sound in *shed?*
(c) The tasks are the same.
(d) I'm not sure.

9. Phonemic awareness instruction

(a) is only meant for students at-risk for reading failure
(b) **potentially benefits most children in kindergarten and 1" grade**
(c) is not appropriate for older students (7+ years old) who have reading problems
(d) I'm not sure

10. Can the words *shoe, do, flew, and you* be used to illustrate oral rhyming?

(a) **yes**
(b) no
(c) only *you, do,* and *shoe,* but *not flew*
(d) I'm not sure

11. An example of matching words with the same final sound is

(a) **please-buzz**
(b) house-hose
(c) of-off
(d) I'm not sure

12. An example of grouping words with a common vowel sound is

(a) kin, fist, kind

(b) paid, said, maid
(c) **son, blood, touch**
(d) I'm not sure.

13. You are helping students break a word into its separate sounds. How many sounds are in the word *grape?*

(a) three
(b) **four**
(c) five
(d) I'm not sure

14 Which list shows a systematic sequence in counting sounds in words from easy to complex?

(a) **ape, lake, break**
(b) hop, shop, shops
(c) toe, bow, float
(d) I'm not sure

15. If you said the word *mixed* without the sound /k/, you would say

(a) mid
(b) **mist**
(c) mitt
(d) I'm not sure

Correct answers are in bold type.
Phonic foil choices are italicized.
Six items related to PA skills.
The first nine items are related to knowledge about Phonemic Awareness Instruction.
Items 10, 11, and 12 measured one's ability to identify and match phonemes in written words.
Items 13 and 14 measured one's ability to count phonemes in written words with consonant blends.
Item 15 measured one's ability to recognize what is left of a word after deleting an individual sound from that word.

**PA or Phonics?**
The second question deals with the ability to distinguish PA and phonics.

## Appendix C

## Principal Information Letter

August, 2015

Dear Colleague,

I am currently pursuing my Doctorate in Education from Northwest Nazarene University. The research I am conducting for my dissertation involves the relationship between teacher knowledge of phonemic awareness and student achievement in kindergarten. This study has powerful implications. We must identify the barriers which prevent our kindergarten students from gaining the phonemic awareness skills necessary to become fluent readers.

I am asking for your support in collecting survey data from kindergarten teachers in the fall of 2015. I will do this through a teacher survey and so it will only require your encouragement to complete. I will also be collecting DIBELS data from the fall of 2015 and winter of 2016. I will gather baseline data regarding student achievement using the fall 2015, DIBELS Assessment in area of letter sounds and then use the winter 2016 data to measure growth. These results will then be correlated with information collected from the teacher survey of phonemic awareness knowledge. My goal is to investigate the relationship between teacher knowledge of phonemic awareness and student achievement.

I appreciate your support as I move forward with my research. I will provide each of you with the results of my research upon completion. Thank you for your time and consideration.

Sincerely,

Dana Harris

# Appendix D

## Informed Consent Form

Dear Participant,

My name is Dana Harris and I am a doctoral student at Northwest Nazarene University. The following information is provided so you may make an informed decision whether to participate in the present study. You may decide not to participate or withdraw from this study at any time.

This study is titled, "Kindergarten Teacher Knowledge of Phonemic Awareness and Instruction: Developing Proficient Early Readers." The purpose of this quantitative study is to investigate the relationship between teacher knowledge of phonemic awareness and student performance on phonemic awareness tasks. The research question guiding this study is the following:

- Do kindergarten teachers possess the skills in phonemic awareness required to teach phonemic awareness to kindergarten students?
- Is there a significant relationship between kindergarten teacher knowledge of phonemic awareness and years of teaching and type of degree held?
- Is there a significant relationship between kindergarten teacher knowledge of phonemic awareness and developing phonemic awareness skills in kindergarten students?

Data will be collected in two formats including a teacher survey and DIBELS data. The teacher survey will be distributed in September and should take no more than 30 minutes to complete. DIBELS data will be collected from kindergarten students in September and again in January to measure growth in first sound fluency.

Do not hesitate to ask any questions regarding this study before or during participation. I would be happy to share results of the study with you at the conclusion of the research. Your name and school will not be associated with the research findings in any way. Teacher surveys will be coded to ensure confidentiality.

There are no risks associated with this study. The expected benefits of this study are the connections that can be made between teacher knowledge of phonemic awareness and student achievement. Increased student achievement in phonemic awareness leading to increased reading proficiency is the goal.

Any questions regarding this study may be addressed to Dana Harris, Primary Researcher at 253.847.3173, 253.840.8936 or harrisdm@puyallup.k12.wa.us. A secondary contact is Research Supervisor, Dr. Russell Joki. Dr. Joki can be reached at 208.866.2111 or rjoki@nnu.edu.

Please sign this document, providing your consent to participate in this study. A copy of this consent form will be provided to you for your records.

**Participant's Understanding**

- I understand this study will be submitted as partial fulfillment of the requirements for the researcher's degree of Doctor of Philosophy at NNU.
- I understand my participation in this study is voluntary and I may withdraw from the study at any time.
- I understand my participation will remain entirely confidential in this study.
- I understand that all data collected will be limited to use in this study.
- I understand that the data collected will be kept confidential and in the possession of the researcher.

**By signing this consent form, I acknowledge that I have read and understand the above information.**

I give my consent to participate in the study:

_____

Name Date

# Appendix E

## Research Confidentiality Agreement

**RESEARCH CONFIDENTIALITY AGREEMENT**

Title of Research: Kindergarten Teacher Knowledge of Phonemic Awareness and Instruction: Developing Proficient Early Readers

Primary Researcher: Dana Harris
Research Supervisor: Dr. Russell Joki

Confidentiality is critical any research conducted and is required by law. The information that you have access to (either submitted by the applicant or gathered during the research process), may not be discussed or shared without all reference to individuals removed.

- I agree to code all teacher questionnaires, teacher surveys, and student data to assure confidentiality to all parties.
- I agree to keep the master list of participating teacher names, associated coding, teacher responses, and correlating student data in a secure, locked location with access only to myself.

I have read the above confidentiality statement and agree to abide by it.

DANA HARRIS
Print Name

Dana Harris 4/23/15
Signature, Date

# Appendix F

## Superintendent Approval Letter

[redacted]

*A Tradition of Excellence*

1854

*Timothy S. Yeomans, Ed.D., Superintendent*

April 23, 2015

Northwest Nazarene University
Attention: HRRC Committee
Helstrom Business Center, 1st Floor
623 South University Boulevard
Nampa, ID 83686

Re: Research Authorization for Dana Harris

Dear HRRC Committee,

Dana Harris has been granted permission to conduct dissertation research in th[redacted] School District. Dr. Glenn Malone, Executive Director of Assessment, Accountability and Student Success, has reviewed Mrs. Harris' dissertation proposal, *Kindergarten Teacher Knowledge of Phonemic Awareness and Instruction: Developing Proficient Early Readers.* This review included proposed research methods, subjects, data and collection procedures, and data analysis.

I support this effort and will provide any assistance required for successful research implementation of this proposed study. If you have any questions, please call me at [redacted]1.1301.

Sincerely,

Dr. Timothy S. Yeomans, Ed.D
Superintendent

*Street Address: 302 Second Street Southeast* [redacted]
*Mailing Address: P.O. Box 370* [redacted] *435-6766*

# Appendix G

## District Approval Letter for Research

[redacted]

*A Tradition of Excellence*

1854

*Timothy S. Yeomans, Ed.D., Superintendent*

February 3, 2015

Northwest Nazarene University
Attention: HRRC Committee
Helstrom Business Center, 1st Floor
623 South University Boulevard
Nampa, ID 83686

Re: Research Authorization for Dana Harris

Dear HRRC Committee,

Dana Harris has been granted permission to conduct dissertation research in the [redacted] School District. Administration of the [redacted] School District have reviewed Mrs. Harris' dissertation proposal, *Teacher Knowledge of Phonemic Awareness and Instruction: Developing Proficient Early Readers*, including proposed research methods (both qualitative and quantitative methods), subjects, data and collection procedures, and data analysis.

This site authorization is offered with the following stipulations:

- Research is to be conducted between September 2015 and August 2016.
- Participation by [redacted] School District employees in the research study is voluntary.
- The school district will receive a copy of the research study results and/or dissertation.

I support this effort and will provide assistance for the successful research implementation of the proposed study. If you have any questions, please call me at [redacted]-1301.

Sincerely,

Dr. Glenn E. Malone
Executive Director of Assessment, Accountability and Student Success

*Street Address: 302 Second Street Southeast* [redacted]
*Mailing Address: P.O. Box 370,* [redacted]-6766

# Appendix H

## Protecting Human Research Participants Certificate

**Certificate of Completion**

The National Institutes of Health (NIH) Office of Extramural Research certifies that **Dana Harris** successfully completed the NIH Web-based training course "Protecting Human Research Participants".

Date of completion: 06/11/2014

Certification Number: 1485933

Appendix I

HRRC Approval to Conduct Research

**Northwest Nazarene University** hrrc@nnu.edu via email.submittable.com

Apr 28

to me

**Dear Dana,**

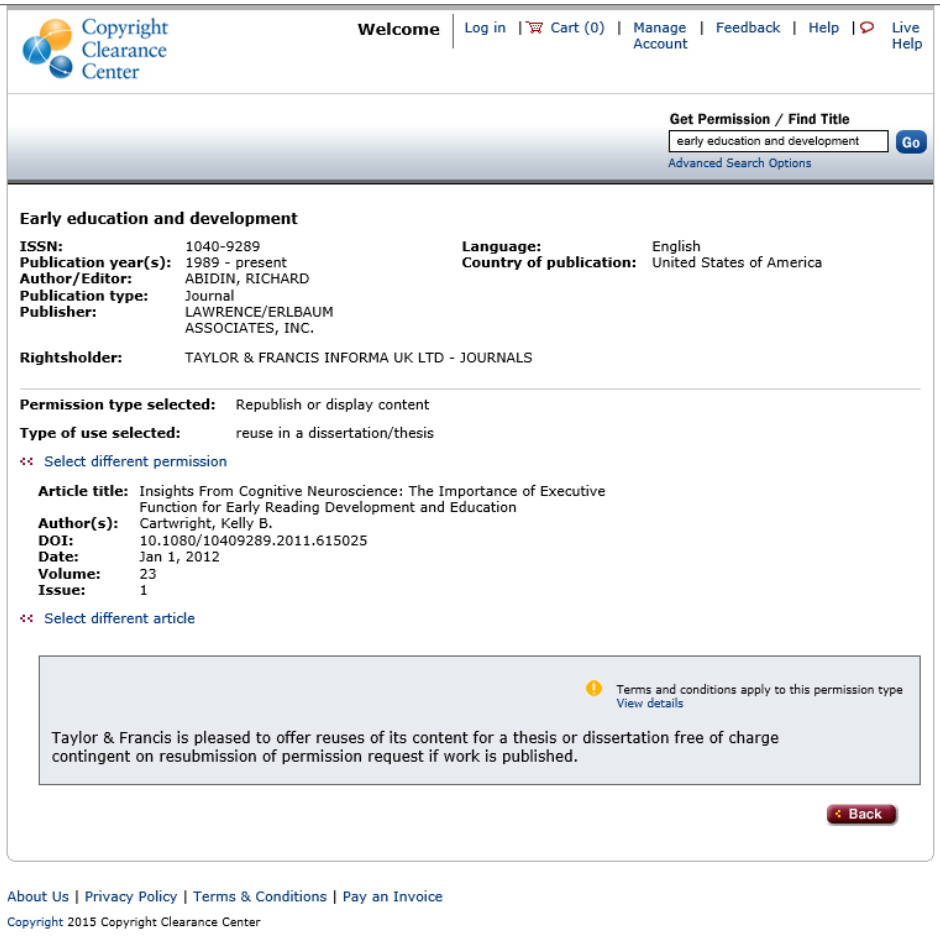
**The HRRC has reviewed your protocol: Protocol #1032015 - Teacher Knowledge of Phonemic Awareness and Instruction: Developing Proficiant Early Readers. You received "Full Approval". Congratulations, you may begin your research. If you have any questions, let me know.**

**Northwest Nazarene University**
**Dr. Lori Werth**
**HRRC Member**
**623 S University Blvd**
**Nampa, ID 83686**

**You can go here to view the submission:**
**http://nnu.submittable.com/user/submissions/3731972**

# Appendix J

## Permission To Use K. Cartwright Material



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