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AN EXAMINATION OF TEACHERS' DISCIPLINARY KNOWLEDGE OF EARLY LITERACY INSTRUCTION

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AN EXAMINATION OF TEACHERS' DISCIPLINARY KNOWLEDGE

OF EARLY LITERACY INSTRUCTION

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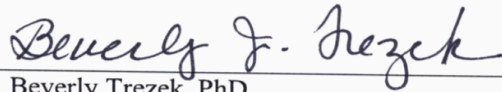with a Concentration in Curriculum Studies

by

Samantha Lazich

Submitted in Partial Fulfillment
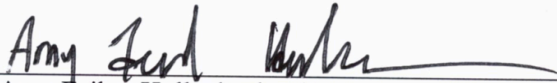of the Requirements
for the Degree of

Doctor of Education

June 2018

We approve the dissertation of Samantha Lazich.

Beverly J. Trezek

Beverly Trezek, PhD
DePaul University
Associate Professor
Department of Counseling and Special Education
Chair of Dissertation Committee

5-15-18
Date

Amy Feiker Hollenbeck

Amy Feiker Hollenbeck, PhD
DePaul University
Associate Professor
Department of Counseling and Special Education
Dissertation Committee Member

5-15-18
Date

Simeon Stumme, PhD
Concordia University Chicago
Associate Professor
Department of Teaching, Learning, and Diversity
Dissertation Committee Member

5-15-18
Date

Eva Patrikakou, PhD
DePaul University
Associate Professor
Department of Counseling and Special Education
Dissertation Committee Member

5-15-18
Date

ABSTRACT

Teacher knowledge in early literacy instruction has been questioned in the field for over 20 years. A theoretical framework outlined by Chall, coupled with the findings of the National Reading Panel, provides a strong foundation for the disciplinary knowledge required to teach children to read. The *Basic Language Constructs Survey*, a tool developed by Cantrell, Joshi, and Washburn, was designed to evaluate teachers' knowledge, skills, and perceptions associated with the language and literacy concepts necessary for early literacy instruction. Developers of this instrument have reported findings of a study exploring the psychometric properties of the survey and investigations using the tool with college professors and preservice teachers; however, no evaluations to date have been conducted with practicing teachers. Using the *Basic Language Constructs Survey*, this study examined 65 practicing K-8 teachers' perceptions, knowledge, and skills of the basic language constructs necessary for early literacy instruction and for assisting students experiencing reading difficulties in grades three and above. The investigation revealed limited disciplinary knowledge among practicing teachers in the areas of phonological awareness, phonemic awareness, phonics, and morphology. Results revealed that success rates for participants were higher on skill-based items as compared to knowledge-based items. Findings also indicated that teachers' estimates of their knowledge were aligned with their actual knowledge. Suggestions for using results to guide teacher professional development and directions for future research are also provided.

Keywords: teachers' knowledge, teachers' skills, teachers' perceptions, Basic Language Constructs Survey (BLCS), early literacy instruction, National Reading Panel (NRP), Chall's Stages of Reading Development

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In addition, I would like to thank the members of my dissertation committee, Drs. Amy Feiker Hollenbeck, Eva Patrikakou, and Simeon Stumme, who provided me with a wealth of expertise, guidance, and support along the way. The insights and perspectives made available to me throughout this journey strengthened this work. I am blessed to have been well supported by an exceptional committee.

Dedication

Dedicated to my grandfather, Djedo Marko, who placed the dream of becoming a Doctor

of Education on an index card.

CHAPTER 1

INTRODUCTION

Reading proficiency for all children became a great priority and began to emerge on a national level approximately 20 years ago. Setting the stage in 1988, *Preventing Reading Difficulties in Young Children*, a report by the National Reading Council (NRC), brought attention to this domestic matter. The NRC, which was commissioned by the United States Department of Education, was tasked with exploring factors facing children who were at risk when learning to read. Following shortly after, a congressional mandate prompted the establishment of a panel to explore reading instruction. As a result, the group published a comprehensive *Report of the National Reading Panel* (2000) summarizing five key areas deemed critical for effective reading instruction. The findings of the National Reading Panel [NRP] then formed the foundation for significant educational reform regarding the ways in which children were taught to read and how teachers were prepared to teach them.

The Reading First Initiative (2001) was an example of one of the first federally supported professional development programs aimed at bringing the content of the NRP report (2000) to teachers across the country. National attention to reading continued a couple of years later through the authorization of the No Child Left Behind (NCLB) Act in 2002. This act proposed that all students must achieve proficiency in reading by third grade. Proficient reading can be defined as earning a score in the average range on a standardized or norm-referenced assessment of reading achievement (National Early Literacy Panel, 2008). Additionally, this act was responsible for putting structures in place to make certain students would meet the target, requiring teachers to earn a *highly qualified* status (e.g., taking additional coursework or attending professional development on reading-related topics), and implementing sanctions to hold teachers and the schools accountable for meeting this benchmark for all students. While the

United States' commitment to ensure reading proficiency for all children by grade three has been articulated through various initiatives for nearly two decades, an aspect of these initiatives that remains at the forefront for improving outcomes for students involves understanding what knowledge teachers must have in order to carry out these tasks in classrooms across the country.

Disciplinary Knowledge

Disciplinary knowledge encompasses the necessary components teachers tasked with teaching children to read must understand and apply in their instructional practices. There are three essential components of content knowledge within the domain of early literacy. First, it is important that teachers are aware of relevant theoretical frameworks that outline the developmental stages for and process in which children learn to read. Secondly, teachers should possess a working knowledge of the specific terminology associated with early literacy instruction. Finally, teachers should possess adequate skills in the domains associated with early literacy instruction be able to recognize what practices are supported by research findings.

The commitment to ensure that all children reach proficiency by third grade is aligned with Chall's Stages of Reading Development (1983), a well-known model of understanding how children learn to read. This stage theory provides a structure for understanding the ways in which readers progress through six phases: 1) prereading, 2) initial reading and decoding, 3) confirmation and fluency, 4) reading for learning, 5) multiple view points, and 6) construction and reconstruction. According to Chall, individuals may progress through the stages at varying rates, but usually follow a similar sequence. Stage three is defined as a stage at which children typically enter third grade. A highlight of this stage is that it marks a shift for young readers as they move from learning how to read to using reading as a tool for learning. Thus, stage three theoretically supports the nationwide goal proposed by NCLB (2002) to achieve reading

proficiency by grade three. While Chall's (1983) model provides a theoretical framework for teachers to understand the process in which children learn to read, to help instruct children it is crucial for teachers to have a solid understanding of instructional practices found most effective. This information is available through the findings of the NRP (2000), which specifically address the components especially important to early literacy instruction.

The report of NRP (2000) identified five areas essential for effective literacy instruction: 1) phonemic awareness, 2) phonics, 3) fluency, 4) vocabulary, and 5) comprehension. The report offers a comprehensive review of each area of instruction and therefore should be of great interest to teachers. The rich descriptions of all five components, coupled with research-based strategies, can assist in strengthening teachers' disciplinary knowledge base. In fact, the findings of the NRP were published in a teacher friendly tool, *Put Reading First: The Research Building Blocks for Teaching Children to Reading* (Armbruster et al., 2001). This manual summarizes and condenses the findings of the report, making them easily accessible to practicing teachers.

Alphabetics, a section in the report dedicated to the findings related to the instructional areas of phonemic awareness and phonics, highlighted the importance of both in earlier literacy instruction. Interestingly, critiques of the NRP report (2000) since its release have centered almost exclusively on the area of alphabetics. However, studies supporting these critiques have yet to be identified by opponents of the NRP. In fact, investigations of alphabetics since the publication of the NRP report continue to support the original findings, and reinforce that instruction in phonemic awareness and phonics is critical for students learning to read. Therefore, in addition to teachers understanding the initial recommendations set forth by the panel, it is important for them to recognize that current findings continue to support the report of the NRP.

The findings of the NRP (2000) identified the necessary content knowledge and instructional strategies, both grounded in research, needed to deliver effective early literacy instruction. A subsequent step is to determine if teachers have the deep understanding of this disciplinary knowledge and adequate skills in order to provide quality instruction in this domain. To accomplish this, it is important that the literature exploring teachers' knowledge in early literacy instruction and their perceptions of their knowledge be reviewed. In addition to the research investigating teacher knowledge, studies exploring the impact of teachers' knowledge on student achievement should also be examined. Finally, investigations that attempt to increase teachers' content knowledge will also shed light on best practices for professional development. An understanding of the current research on these topics associated with teachers' disciplinary knowledge as it relates to early literacy instruction will assist in contextualizing the present study.

Purpose of the Present Study

The theoretical framework outlined by Chall (1983), coupled with the findings of the NRP (2000), provide a strong foundation for the disciplinary knowledge and skills required to teach children to read. In the area of alphabetics specifically, the findings of the NRP continue to be supported by current research. However, it is important to ensure that teachers have an adequate understanding of this content and that they can apply their disciplinary knowledge and skills to inform instructional practices. Simply put, there is a need to know what teachers know and what they do not know about the content of early literacy and what skills they possess to deliver instruction to students. This is particularly important in order to organize the necessary professional development to close gaps in teachers' knowledge, with the ultimate goal of enhancing the instruction that early literacy learners receive. Therefore, the purpose of this study

was to examine the disciplinary knowledge and skills of basic language constructs that are essential for early literacy instruction and that assist students experiencing reading difficulties in grades three and above. Findings of this investigation are used to identify gaps in teachers' knowledge and skills and pinpoint areas for potential professional development topics. Suggestions for future research are also be explored.

Relevant Literature

In addition to providing a thorough overview of Chall's Stages of Reading Development (1983) their relation to the findings of the NRP, and a discussion of studies of alphabetics since the publication of the NRP, and a review of the literature as it relates to exploring teachers' disciplinary knowledge in early literacy instruction is provided in Chapter Two. Specifically related to teacher knowledge, studies were reviewed and found that as early as 1994, findings indicated a lack of necessary content knowledge among practicing teachers (Moats, 1994). Subsequent studies, including those after federal initiatives such as the report of the NRP (2000) and NCLB (2002), continued to support initial findings. Collectively, studies assessing teacher's disciplinary knowledge have revealed low levels of content knowledge among teachers, specifically in the areas of phonemic awareness and phonics (i.e., alphabetics).

In Chapter Two, studies examining teachers' perceptions of their disciplinary knowledge will also be explored, with findings indicating discrepancies between perceptions and knowledge. Implications for these disparities are explained further in the chapter. For example, a lack of disciplinary knowledge can have a negative effect on the literacy instruction provided in their classrooms. This is especially important because investigations included in the review found that teacher knowledge does have an impact on student improvement. In fact, findings of

studies suggest that students placed in classrooms with knowledgeable teachers demonstrated higher levels of improvement.

Results from studies examining attempts to increase teacher knowledge have achieved promising results. As will be explored further in the literature review, well planned and executed professional development with accompanying in-school support (e.g., coaching) has proven to be successful in helping teachers acquire the necessary content knowledge in early literacy instruction. Of particular interest in the context of the present study are the studies examining disciplinary knowledge and perceptions of knowledge among practicing teacher. The overall lack of research in this domain provides further support for the proposed study and the potential of the findings to contribute to the literature.

Methodology

Chapter Three offers a description of the methodology for the present study. First, the partnership between a university and educational foundation that is rooted in their shared mission to support high quality education in parochial schools in a large urban city will be described in order to contextualize the study setting and participants. The role of the principal investigator and as a liaison between the two respective organizations will also be explained. A detailed description of the instrument that will be used in this investigation, the *Basic Language Constructs Survey* (Binks-Cantrell, Joshi, & Washburn, 2012), and procedures for data collection will be presented and discussed. Finally, the proposed analyses to address the following five research questions are provided.

Research Questions

This study will seek to answer the following research questions related to the knowledge, skills, and perceptions of preschool through eighth grade urban parochial school teachers: 1)

What knowledge do teachers have of early literacy instruction? 2) What skills do teachers possess in relation to early literacy instruction? 3) What are teachers' perceptions of their knowledge and skills? 4) What is the relationship between teachers' knowledge, skills, and perceptions? and 5) What relationships exist between teachers' knowledge, skills, and perceptions and relevant demographic variables (i.e., grade level taught, educational background, years of teaching experience, and participation in previous professional development)?

Results

Chapter 4 reports on the results of this investigation of disciplinary knowledge required for early literacy instruction. Descriptive statistics (i.e., average percentage correct, mean scores, standard deviations, percentages) are reported in order to examine the knowledge and skills of participants as well as their perceptions. Findings of the Pearson correlation analysis are described to further examine the relationships between the three constructs (i.e. knowledge, skills, and perceptions). Finally, results of the linear regression analysis are presented to investigate the role that exists among demographic variables (i.e., grade level taught, educational background, years of teaching experience, and participation in previous professional development).

Discussion

Chapter 5 discusses findings of the present study. Relationships between reported levels of knowledge and skills are explored. Further, results are examined according to the four domains of early literacy assessed (i.e., phonological awareness, phonemic awareness, phonics, and morphology) and compared to findings of similar, previously conducted investigations. Perceptions of participants and demographic variables are also explored and compared with the

findings of similar studies. Limitations of the present study and directions for future research are
also presented and discussed.

CHAPTER 2

REVIEW OF LITERATURE

The 21st century marked a time in which a major commitment was made in this country to ensure proficient reading levels for all children. Despite federal initiatives (e.g., No Child Left Behind) and supporting structures for improving reading education (e.g., Reading First), it remains unclear if the teachers expected to carry out the task have a sufficient understanding of the content knowledge necessary to teach children to read. This uncertainty in teacher's content knowledge is investigated further in this chapter. Specifically, this review examines teachers' knowledge of reading instruction, teachers' perceptions of their content knowledge, the relationship between teacher knowledge and student improvement, and attempts to increase teacher knowledge of the foundations of reading instruction. To contextualize this literature, a discussion of Chall's Stages of Reading Development (1983) and an overview of the finding of the National Reading Panel (2000) are presented first.

Chall's Stages of Reading Development

Drawing on 25 years of experience working with students with severe reading disabilities, coupled with the available research at the time, Jeanne Chall is credited with developing an influential model of understanding of how individuals learn to read. Chall's well-known book, *Stages of Reading Development* (1983), presents a framework that is organized into six developmental stages. The stages begin with outlining the skills and abilities required of young children as they start to make sense of letters, words, and books, and progresses to the most advanced stage that signifies a mature reader. While individuals are expected to move through the stages at varying paces, all will essentially follow a similar sequence. Progression through the stages is reflective of the individual's interaction in his/her environment. For

example, a young child who is not exposed to books prior to the entrance of school may progress at a slower pace than one who has been afforded numerous experiences with books. Chall's six stages are briefly described below.

Stage 0: Prereading

Stage 0, ranging from birth to the age of six, is the longest and illustrates the greatest amount of development. As children are making sense of the world around them, they are beginning to accumulate knowledge related to letters, words, and books. In a general sense, children begin to understand essential concepts about reading, such as holding a book right side up or distinguishing between print and illustrations. This stage also brings attention to the home environment as a powerful contributor to a child's development, as frequently being read to at home can support the growth of this type of knowledge.

Aspects related to language development, which allow students to gain a greater understanding of sounds and words, are also developed at home through reading experiences. Recognizing beginning or ending sounds in words and blending or segmenting word parts are both examples of how young children learn about language in this stage. A connection to print also develops as children begin to recognize and print letters of the alphabet. Children may also recognize words or signs in their community during this period of development. While this activity may appear as though the child reading, s/he is simply making a connection between the letters and the meaning associated with the sign (Chall, 1983).

Stage 1: Initial Reading and Decoding

Children in this stage typically fall between the ages of six and seven and are in first and second grade. Essentially, children are learning about the relationship between letters and sounds and they begin to sound out single syllable words. High frequency words begin to accumulate in

their memory as they begin to recognize them in print. With the ability to sound out simple words and a bank of high frequency words, children in this stage can begin to read simple text. *The Cat in the Hat* by Dr. Suess is a text reflective of one read by children in this stage. The combination of simple, single syllable words such as *cat* and *hat* along with high frequency words that are easily recognizable make reading the text achievable for children of this age (Chall, 1983).

During this period of development, children favor oral reading over silent reading. Teachers working with early readers in this stage must focus on delivering direct, systematic instruction of the relationship between letters and sounds, also known as phonics instruction. This means that the content is carefully chosen to reflect skills necessary for initial reading and decoding purposes and is delivered in a logical sequence. Teachers are clear when stating the purpose and directions for every lesson and when providing feedback to students. Opportunities at home in which children are read to should continue and will add to the students' growth in this stage (Chall, 1983).

Stage 2: Confirmation and Fluency

Stage 2 involves children who are typically seven or eight years old and are in second or third grade. New information is not being introduced at this stage, but rather children take knowledge learned in Stage 1 to deepen and strengthen their understandings. Children will use decoding skills learned in the previous stage to gain confidence and speed, also known as building fluency. When reading, children are able to sound out or use the context to help with unfamiliar words. That said, this period also brings silent reading levels to align closer to that of oral reading levels. An understanding that text carries meaning begins to develop and students shift greater attention to comprehend the text as they read.

Opportunities to read simple stories in both home and school environments are especially important. Children at this stage need ample practice with print within both environments to increase their fluency. At school, continued direct and systematic instruction is important, as advanced decoding skills (e.g., multisyllabic word reading) are introduced in this stage. Exposure to books of all types is especially critical to ensure that children are motivated and confident in their reading. This is equally important at home. Home environments that provide a variety of books for independent practice and to be read aloud by adults can further support children in this stage (Chall, 1983).

Stage 3: Reading for Learning

A shift from learning to read to reading to learn is the focus of Stage 3. Chall (1983) describes this stage as a time in which children read to learn for new information, knowledge, thoughts, and experiences. Stage 3, ranging from grades 3 to 8, is further divided into Stages A and B. Stage A, covering grades 4 through 6 or ages 9 through 11, is characterized by the child settling into this stage of reading to learn. Texts in this stage are reflective of subjects typically introduced in schools, such as social studies or science textbooks that require students to read about conventional knowledge of the world. Stage B, on the other hand, introduces middle school students to text that is more closely aligned with those an adult might read and also brings about a variety of text. Popular magazines or newspapers are examples of this. In this stage, children begin to analyze and react to various viewpoints as part of their reading experiences. Movement between Stage A and B will also promote growth in the child's ability to react to text, an important element for entry into the next stage.

Stage 4: Multiple Viewpoints

A Stage 4 reader is typically a 14- to 18-year-old enrolled in high school. The main focus of this stage involves young adults dealing with the multiple points of view within their reading experiences. The quantity and difficulty of the text significantly increases in this stage. As such, the depth of text both in and out of school brings greater opportunity for students to work with varying points of view. Readers in this stage are able to deal with layers of facts and concepts in complex text (Chall, 1983).

Stage 5: Construction and Reconstruction

Readers who fall in Stage 5 are considered mature readers. Chall (1983) describes readers in this stage as ranging from the age of 18 and above or entry into college. At this point of development, a reader efficiently and quickly engages with print materials for both personal and learning needs. This stage marks a reader's ability to read a text from beginning to the end in order to fulfill the initial purpose for reading it. Essentially, readers at this final stage are successful at constructing knowledge through the integration of their own and others. Chall does not confirm whether all readers reach Stage 5, but suggests that there is an increase of readers achieving this level among college students. As will be illustrated in the following section, the stages of reading development proposed in the theory offered by Chall are further bolstered by the findings of the National Reading Panel (2000).

National Reading Panel

In response to a congressional mandate in 1997, The National Reading Panel [NRP] (2000) was formed to evaluate the research available in reading instruction and the effectiveness of various instructional approaches. This panel of 14 individuals who took on this great task included scientists in reading research, college of education representatives, reading teachers,

educational administrators, and parents. A thorough examination resulted in the identification of approximately 100,000 research studies available since 1966. With this large number, it was important that the panel develop a set of criteria for examining the research. Therefore, the panel determined that the research must: (a) measure one or more skills in reading, (b) cover a large population of students, (c) examine the effectiveness of an approach, and (d) be considered high quality.

The panel also took into consideration the findings from the National Research Council (NRC) *Preventing Reading Difficulties in Young Children* report (Snow, Burns, & Griffin, 1998) and 125 written testimonies shared at various public hearings by individuals and organizations representating those who would utilize any findings presented by the panel. In 2000, the panel summarized their findings in the NRP report. This report identified five essential areas needed for effective literacy instruction. Phonemic awareness, phonics, fluency, vocabulary, and comprehension comprised these five areas, which are further described below.

Phonemic Awareness

Phonemic awareness is strictly an auditory skill and involves the ability to identify and manipulate sounds in spoken words. Children must understand that a *phoneme* is the smallest unit of sound. The English language has approximately 41 phonemes. Some words have one phoneme, while others have more than one. For example, the word *we* has two phonemes (/w/ /e/); *sheep* has three phonemes (/sh/ /ē/ /p/), and *stop* has four phonemes (/s/ /t/ /ŏ/ /p/). As part of phonemic awareness instruction, children are asked to work with phonemes in various capacities. This can include identifying phonemes, blending them to form words, segmenting words into phonemes, and deleting, adding, or substituting phonemes to make new words. Asking children to change the /m/ sound in the word *mat* to a /c/ sound is an example of substituting phonemes to

make the new word *cat*. According to the findings of the NRP, blending and segmenting are the two phonemic awareness activities that should be emphasized since they are most closely related to later reading and spelling skills. Phonemic awareness falls within Chall's (1983) Stage 0, since aspects related to language development are exercised through phonemic awareness instruction (National Reading Panel, 2000).

The findings reported by the panel make clear that phonemic awareness instruction can significantly improve the ability to read. Children of varying age and grade levels were reported to have increased their phonemic awareness abilities through instruction. Reading and spelling skills also increased as a result of instruction in this area. In those studies, a systematic and explicit approach to instruction was used. The panel draws attention to a common confusion between phonemic awareness and phonics. Phonemic awareness does not make any connection to print. The relationship between sounds and print is part of phonics instruction (NRP, 2000).

Phonics

Phonics, put simply, involves understanding the relationship between sounds of the spoken language and print. While the smallest unit of sound is a phoneme, the smallest unit of print, a letter, is called a *grapheme*. Phonics instruction helps children understand the various connections between the two. An understanding of these relationships will help students decode unfamiliar words as they begin to read print. For example, the letter combination *oi* is a diphthong. Learning that a diphthong is a vowel blend in which the first sound slides into the second sound rather than two separate vowel sounds will help students read words like *soil* or *coin* (NRP, 2000). Chall's (1983) Stage 1, initial reading or decoding, focuses on teaching the relationship between letters and sounds.

The panel's findings were very clear that systematic and explicit phonics instruction is particularly effective for teaching children to learn to read. This proved to be highly favorable over a non-systematic approach or no phonics instruction. A systematic phonics approach involves the direct teaching of a predetermined sequence of letter-sound relationships. Students in kindergarten through 6th grade and those experiencing reading difficulties were both found to benefit greatly from a systematic approach (NRP, 2000).

Fluency

Fluency is defined as the ability to read text accurately and quickly and with expression properly matching the content of the text. It is important for readers to become fluent so they are able to place attention on understanding what they are reading. When a reader places their attention on the application of decoding skills alone, they are unable to direct ample attention to understanding the text. A fluent reader reads effortlessly, sounding as if they were speaking. A reader that is not fluent will read slower with a pace that sounds labored or choppy. In this case, the reader is unable to direct much attention to comprehending the text (NRP, 2000). Chall (1983) dedicates Stage 2 to building fluency. This stage provides children the opportunity to practice their decoding skills to gain speed and confidence in their reading.

The panel's findings address two instructional approaches for building fluency. First, the panel recommends repeated oral reading opportunities for children, coupled with systematic and explicit feedback from the teacher. An example is providing children a readers' theater script. This activity asks children to practice an assigned role by reading lines several times in preparation for a final reading. This is favored over a traditional round robin approach, one that instructs all students to read from the same text, making it hard to give attention to the varying reading levels of participating students. The panel was unable to confirm any positive influence

on reading fluency through silent reading opportunities. While there was a connection between reading ability and the volume of reading, the panel could not confirm a relationship between silent reading and improvements in fluency (NRP, 2000).

Vocabulary

Vocabulary, as defined by the NRP (2000), are the words children must know to effectively communicate. The panel further divides vocabulary into two types, oral and written. Oral vocabulary includes the words children use when listening and speaking. Opportunities to engage in rich discussion can help support a child's oral vocabulary. Written vocabulary encompasses the words children recognize when reading and those used in their writing. Children who read more will gain exposure to more words, thus increasing their written vocabulary. Given that vocabulary growth is reflective of exposure to words in various contexts and continues to grow through rich experiences, vocabulary is reflective in all phases of Chall's (1983) stages of reading development.

The panel also reported that a majority of the words that children learn are taught indirectly. Through everyday experiences with oral and written language both in and out of school, these encounters provide opportunities for children to learn the meanings of words. However, they also report that some vocabulary should be taught directly. Teaching children to use context clues when reading an unknown word or how the prefix *un* can change the meaning of a word are both examples of direct instruction in vocabulary (NRP, 2000).

Comprehension

The final area reported by the panel is essentially the true purpose for reading, comprehension. Comprehension is the reason we read, to gain meaning from the text. Research findings suggest that good readers are both purposeful and active. Metacognition, or thinking

about thinking, is also a skill addressed in the report of the NRP (2000). Children who use metacognitive strategies when reading are able to monitor and adjust as necessary to ensure complete understanding as they read. For example, a student may modify their speed while reading if the text becomes difficult for them. Chall (1983) places an emphasis on the comprehension in Stage 3 when children shift from learning to read to reading to learn. Comprehension continues to be an area of emphasis in Stages 4 and 5 as young adults read for various purposes.

The panel's findings revealed that comprehension could be developed through the teaching of six strategies. These strategies include monitoring comprehension, using various organizers, understanding story structure, summarizing, and asking and answering questions to monitor understanding. Research findings also suggest that explicit instruction is effective when teaching these strategies. Working cooperatively and multi-strategy instruction was also reported as successful when helping children strengthen their comprehension (NRP, 2000). In order for teachers to provide effective instruction, knowledge of these five areas of instruction is critical.

Critiques of the National Reading Panel

Following the release of the NRP report in 2000, some individuals expressed criticisms of the findings. Critics of the NRP argued that panel members were researchers who lacked experience in teaching and thus approached the study from a perspective of a scientist rather than a reading teacher. A second concern presented by opponents was the panel's exclusion of qualitative research and specifically the methodological standards the panel used to screen studies, which are the same standards used for interventions in psychological and medical research (Garan, 2001). Critics also drew attention to minor organization issues such as different

versions of the report with varying formats and inconsistencies found between the report and its subreports (Garan & Shanahan, 2001).

Outside of the general concerns presented above, critics have specifically directed their attention to the alphabetics (i.e., phonemic awareness and phonics) section of the report. Arguments directed against this section specifically assert that a meta-analysis consisting of 38 studies does not constitute a comprehensive and scientific review of research in phonics as described by the panel. The number of studies prompted critics to infer that a meta-analysis of 38 studies compromised the reliability of the results shared in the report. They further argued that, of the 38 selected studies, all of them explored isolated skills and did include any investigations that explored the use of phonics in authentic literacy experiences (Garan, 2001).

Following the initial critiques, publications continued to follow with both sides disputing the claims made by the other. As previously indicated, one critique described the panel as a group of researchers who lack experience in teaching. However, the introduction of the report clearly contradicts this, stating that among the 14 members there was a wide range of educational representatives including scientists in reading research, reading teachers, college of education representatives, educational administrators, and parents (NRP, 2000). Panel members have since explained that the medical standards used to systematically search the literature are also the same standards used in behavioral and social sciences.

Additionally, panel members made it clear that using such standards ensured an unbiased approach to the analysis. It is important to note that within the 49 phonics studies reported by the NRP (not 38 as reported in critiques), a total of 217 test comparisons were made. Included in these comparisons are studies that do not focus solely on isolated phonics skills, but also several that use reading a text as an outcome. In fact, panel members have requested that studies of

phonics that critics believe may have been omitted from the analysis be shared; however, this request has gone unanswered. As one panel member explained, one critic "…claims that there are thousands of studies in phonics, but doesn't point to any we missed" (Garan & Shanahan, 2001, p. 71). In response to the organizational issues, panel members acknowledged that the report is imperfect and rather dense for teachers to use (Shanahan, 2005); therefore, publications such as *Put Reading First: The Research Building Blocks for Teaching Children to Read* (2001) is an attempt by the panel to deliver the content of the report in a useful and easy to read format for practicing teachers.

Studies of Alphabetics Since the National Reading Panel

Since there was controversy surrounding the NRP's (2000) review on the topic of alphabetics, it is important to review the research since the publication of their findings. The panel concluded both components of alphabetics, including phonemic awareness and phonics, significantly improve a child's word reading, comprehension, and spelling. In addition, key findings from the research suggest children who have phonemic awareness skills will have an easier time learning to read and spell and that a systematic and explicit approach to phonics instruction makes a significant contribution to a child's reading growth.

Despite the differing opinions regarding the importance of instruction focused on the development of alphabetics, relatively few studies have been conducted since 2000 to either confirm or deny the conclusions drawn by the NRP in this area. In fact, a review of the literature identified only 11 studies of alphabetics, 3 focused on phonemic awareness, 3 on phonics, and 2 on both phonemic awareness and phonics. An additional three studies focused on the development of phonological awareness abilities.

Phonemic Awareness

In one investigation of phonemic awareness, the researchers were interested in examining the impact of phonemic awareness instruction on the development of early literacy skills among 92 kindergarten students (Reading & Deuren, 2007). Half of the participating students did not receive phonemic awareness instruction during their kindergarten experience (No Phonemic Awareness in Kindergarten or NPAK group) while the other half received direct instruction in phonemic awareness (Phonemic Awareness in Kindergarten or PAK group). In first grade only, both groups received direct instruction in phonemic awareness and were assessed using the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) at the beginning, middle, and end of the year (Good & Kaminski, 2002). Researchers used student data from the Phoneme Segmentation Fluency (PSF) subtest of the DIBELS administered in first grade to compare performance across groups.

Findings indicated that the PAK group reached benchmark levels and significantly outperformed the NPAK group at the beginning of first grade. By the middle of first grade, and after all students received instruction in phonemic awareness, student data indicated that while both groups reached benchmark levels on the PSF measure, a significant differences between the two groups remained. Data from the spring measure found no significant difference between the two groups. Researchers concluded that systematic phonemic awareness instruction in kindergarten did have a positive effect on students' phonemic awareness skills. For children who have not had phonemic awareness instruction in kindergarten, this investigation also revealed that with instruction in first grade, children can catch up and reach benchmark levels by the middle of the year (Good & Kaminski, 2002).

In a more recent study, researchers examined the relationship between phonemic awareness and reading comprehension (Edwards & Taub, 2016). Researchers specifically investigated two constructs of phonemic awareness, blending and segmenting. The NPR suggested blending and segmenting as activities that can increase phonemic awareness in children. Assessment data from two measures with proven reliability and validity were analyzed for 84 first through fourth grade students. Phonemic awareness was assessed using the *Comprehensive Test of Phonological Processing* (Wagner, Torgesen, & Rashotte, 1999) and reading comprehension with the *Woodcock-Johnson Tests of Achievement III* (McGrew & Woodcock, 2001). This investigation found that phonemic awareness, both blending and segmenting, had a statistically significant correlation with reading comprehension. However, the effect size was greater for blending and comprehension as compared to segmenting and comprehension. These findings prompted researchers to reconfirm the recommendations offered by the NRP, suggesting students should engage in approximately 15 minutes of daily phonemic awareness instruction, which should not exceed 20 hours over a school year (Edwards & Taub, 2016).

Finally, a meta-analysis was recently conducted to explore the long-term effects of reading interventions in phonemic awareness, phonics, fluency, and comprehension (Suggate, 2014). Specifically, studies of intervention approaches that included a post-intervention follow up were included in this analysis to examine the long-term effects of reading interventions. Findings indicated a distinct advantage for phonemic awareness interventions only. In other words, when comparing the effect sizes of follow up interventions, interventions focused on the development of phonemic awareness abilities had the largest long-term effect. Preschool and

kindergarten were also identified as optimal times for phonemic awareness interventions (Suggate, 2014).

Phonics

In the first study of phonics, researchers worked with five- to seven-year-old at-risk readers to compare two interventions (Chen & Savage, 2014). One group received a simplicity principle based-reading intervention and another group received a word usage and meaning intervention. The word usage and meaning intervention can be described as a meaning based approach to learning grapheme to phoneme correspondences, while the simplicity principle based reading intervention was designed to explicitly teach an extended list of 64 of the most commonly found grapheme and phoneme correspondences (e.g. vowel patterns, digraphs, endings) with those occurring most often in texts being taught first, followed by those that were less frequently occurring. This systematic approach to phonics instruction is not only aligned with the general recommendations of the NRP for instruction, but was also associated with key findings of the Panel indicating that this type of approach is especially beneficial for at-risk readers.

The findings of this study solidified those of the NRP, in that the at-risk students in the simplicity principle-based reading intervention group showed greater improvement on all post-test assessments. Because scores between the two intervention groups did not differ at pre-test, the researchers attributed the difference in post-test scores to the effectiveness of the simplicity principle-based reading intervention. Students in this phonics-based intervention group improved in measures related to spelling, word recognition of the grapheme and phoneme correspondences taught, reading motivation, and self-reported strategy use (Chen & Savage, 2014).

Researchers in a second investigation compared phonics and sight word training among 104 children with dyslexia (MacArthur et al., 2015). The investigators narrowed their focus to determine if the order of instruction, sight words over phonics and vice versa, would have differing effects on reading skills including sight word reading, phonics reading (nonsense words fluency and accuracy), and general reading ability (reading fluency and comprehension). Children were divided into three groups, one group received phonics training first followed by sight word training, a second group received sight word training first with phonics training following, and the last group received both trainings simultaneously.

Results indicated that both sight word and phonics training had a significant effect on their respective measures for students with dyslexia. In other words, students who participated in eight weeks of phonics training had statistically significant gains on measures in phonics and similarly students who participated in eight weeks of sight word training had statistically significant gains on measures of sight word reading. Both types of trainings were also found to have a significant effect on general measures of reading, specifically fluency and comprehension, for students with dyslexia. Using the same general measures of reading, researchers also explored the order of training and found that placing phonics training before sight word training had a slight advantage. This finding prompted researchers to suggest phonics training prior to sight word training, even though teachers typically teach both simultaneously, to lead to greater increases of regular and irregular word accuracy for children with dyslexia (MacArthur, et. al., 2015).

The third investigation of phonics involved a meta-analysis exploring the relationship between phonics instruction and the academic success of minority students (Jeynes, 2008). For purposes of this analysis, studies with at least 75% of participants identified as minority students

were included. In this investigation, phonics was defined as teaching children the relationship between graphemes and phonemes, and academic success was defined through the use of measures that support educational outcomes. Examples of those measures include standardized tests, classroom tests, grades, teacher ratings, or oral responses.

General findings of the meta-analysis indicated that minority students benefitted from phonics instruction; however, the overall effect sizes were considered small. For example, studies with 100% minority students had an effect size of .23, while studies that included mostly minority students (i.e., at least 75%) had a similar effect size of .22. Findings also indicated that there was no advantage as to when phonics was taught to minority students. That said, if students do not receive phonics instruction in earlier grades as suggested by the NRP, instruction in grades two through six should still take place. These findings suggest that it does not matter if students receive phonics instruction earlier or later in their years of schooling they will still receive benefits (Jeynes, 2008). This suggestion is also in keeping with the NRP's findings that phonics instruction in grade two through six contributes to improvements in word reading and oral reading skills.

Phonemic Awareness and Phonics

Researchers in New Zealand investigated an explicit approach to phonemic awareness and phonics instruction for six- and seven-year-old students in whole language reading classrooms that typically do not emphasize explicit instruction in these areas (Ryder, Tummer, & Greaney, 2007). Students were randomly selected to receive phonemic awareness and phonics interventions or to continue to receive the reading intervention in place prior to the study. As part of the intervention, the treatment students were asked to identify and count phonemes in words as part of their intervention group time, a task suggested by the NRP for developing phonemic

awareness. Phonics instruction, as recommended by the NRP, was both systematic and explicit. For example, the introduction of word types followed a developmental pattern with consonant-vowel-consonant (CVC) words with the same vowel sound presented first, followed by consonant-consonant-vowel-consonant (CCVC) words, and then by consonant-vowel-consonant-consonant (CVCC) words.

Findings of this study indicated that students in the intervention group significantly outperformed the comparison group on measure of phonemic awareness, pseudoword decoding, and context free word recognition and also approached statistical significance in reading comprehension measures. Even more compelling was the two-year follow up data, which found students in the intervention group were 9 months ahead of the control group on measures of word recognition in isolation and 14 months ahead in word recognition in context (Ryder, et. al., 2007).

In a similar study conducted in the United States, researchers investigated differences between a phonics-based instructional approach and an integrated language arts approach with a sample of over 6,000 kindergarten students (Sonnenschein, Stapleton, & Benson, 2010). In this study, the researchers defined a phonics approach as one that included instruction in phonemic awareness, phonics, and decoding skills and an integrated language arts approach as one that emphasized meaning. Using a nationally representative data set of all 6,000 students, five points of data were used to gather estimates of reading ability. Those five points included achievement data from fall and spring of kindergarten, first, third, and fifth grade. To gather data about instructional approaches, teachers completed measures in the spring of each year indicating the instructional activities used in their classrooms. For example, questions from this measure were used to determine how often children in the class work on matching letters to sounds and how

often children completed an activity related to a book or story. The instructional data was then sorted into the categories of phonics and integrated language arts instruction (Sonnenschein, et. al., 2010).

This investigation revealed that students placed in classroom using an integrated language arts instructional approach did not learn phonics skills; however, the students placed in classrooms with direct instruction in phonics did. Findings also indicated that students who entered kindergarten with a higher level of phonics skills did benefit from the integrated language arts instruction. This finding suggests that students who enter kindergarten with weak phonics skills should receive direct instruction in phonics skills while those students who enter kindergarten with a higher level of phonics skills could be ready for meaning-based reading instruction. The researchers also highlighted the importance of teachers who are aware of their students' ability and the knowledge of recommended instructional practices that best serve students (Sonnenschein, et. al., 2010).

Well over a decade since the publication of the findings of the NRP, the investigations available in alphabetics continue to support the panel's recommendations (Reading & Deuren, 2007; Ryder, et al., 2007; Sonnenschein, et. al., 2010; Chen & Savage, 2014; Edwards & Taub, 2016,). These studies add to the research supporting the importance of instruction in phonemic awareness and phonics as part of early literacy instruction. Students who are afforded instruction in alphabetics as suggested by the NRP continue to make gains in learning to read.

Other Phonological Based Studies

As part of their recommendations, the NRP (2000) addressed a common misunderstanding between the terms phonological awareness and phonemic awareness among educators. Phonemic awareness, one of the five essential elements critical for effective reading

instruction, is a subcategory of phonological awareness. Phonological awareness is a general category of working with and manipulating aspects of oral language (e.g., rhyming, syllable segmentation and blending). Although important, the panel recommended instruction in phonemic awareness, a narrow category that requires the identification and manipulation of single phonemes. This distinction is important as activities to support phonological and phonemic awareness differ and should not be used interchangeably (NRP, 2000).

In an attempt to address this common misconception among early literacy educators, an investigation explored varying approaches for teaching phonemic awareness to 4- and 5-year-old students in Head Start classrooms (Yeh, 2003). Although the NRP addressed the common misunderstanding between phonological and phonemic awareness, researchers have found that educators and administrators continue to believe that instructional strategies that develop phonological awareness are also adequate for developing phonemic awareness (Yeh & Connell, 2008). In this study of 44 students, half participated in activities supporting phonological awareness development (i.e., rhyming and alliteration), whereas the second group's instruction focused specifically on three phonemic awareness activities recommended by the Panel (e.g., segmenting, blending, phoneme substitution).

Post assessment data revealed that students who received instruction in the activities recommended by the NRP (2000) showed significant gains in phonemic awareness and letter-sound relationships and that this instruction was found to be more effective than rhyming and alliteration. A significant observation reported in the fourth week of this nine-week study showed an interesting correlation between instruction in phonemic awareness and a child learning to read. A small number of students in the group receiving phonemic awareness instruction were

observed reading a 25-word story, even more impressive was the report that these students had not heard this story prior to reading it independently (Yeh, 2003).

Five years later, researchers returned and expanded their sample size to 128 4-and 5-year-old students in Head Start classrooms (Yeh & Connell, 2008). Despite the recommendations of the NRP (2000) and previous research findings (Yeh, 2003), the curriculum used to address phonemic awareness in Head Start classrooms continued to focus on rhyming and vocabulary development over phoneme segmenting and blending activities. All participating students, also identified as nonreaders prior to the study, were divided into three groups. One group received instruction in the segmentation, blending, and phoneme substitution, another group in rhyming activities, and the third group received vocabulary instruction.

Findings indicated that all three groups made significant gains on measures of phonemic awareness, letter-sound knowledge, decoding, word recognition, rhyming, and vocabulary. Respectively, each group made the most gains on measures reflecting the instruction received. As such, the rhyming group made the most gains on measures of rhyming, the vocabulary group made the most gains on measures of vocabulary, and those receiving instruction in phonemic awareness made the most gains on measures in phonemic awareness.

While all groups made gains, the findings again reflected that instruction in blending, segmenting, and substituting phonemes as suggested by the NRP (2000) are those that provided the greatest gains in phonemic awareness development (Yeh & Connell, 2008). While rhyming and vocabulary activities have a place in early literacy instruction, phonemic awareness is designated as one of the essential five elements critical for helping children learn to read and is also backed by the research of the NRP as well as recent studies (Ryder, et al., 2007; Chen & Savage, 2014; Edwards & Taub, 2016).

Another investigation conducted in the United Kingdom further explored phonological awareness instruction with a large sample of over 400 4- and 5-year-old children (Hatcher, Hulme, & Snowling, 2004). Researchers randomly placed students in one of four reading programs; reading alone, reading with rhyme, reading with phonemes, and reading with rhyme and phonemes. While each program varied, all four offered explicit phonological and phonemic awareness training for a total of two years. Students were measured using a large battery of assessments containing a total of 12 measures.

Findings revealed that while students did make improvements in their phonological skills, those improvements did not translate into improvements in reading scores. That said, phonological awareness did not contribute to students' growth in reading, something researchers expressed as unexpected. The investigation also revealed that at-risk students in groups that received training in phonemes made more progress in learning to read when compared with students in groups that did not receiving any training in phonemes. These findings corroborate key findings of the NRP (2000) suggesting that instruction in phonemic awareness helps children learn to read (Hatcher et. al., 2004).

To date, research continues to support the findings of the NRP (2000). Specifically, instruction in phonemic awareness and systematic and explicit phonics instruction is critical for students learning to read and contributes to student's overall reading improvement (Ryder, et al., 2007; Chen & Savage, 2014; Edwards & Taub, 2016). Since the publication of the report, the Panel has worked to ensure that the findings are easily accessible to teachers. For example, *Put Reading First: The Research Building Blocks for Teaching Children to Read* (2001) shares keys findings from the NRP, with particular attention to common misconceptions, in an effort to ensure that teachers have developed correct understandings of the necessary content knowledge.

However, findings have also indicated possible discrepancies among educators and administrators in regards to this content knowledge (Yeh, 2003; Yeh & Connell, 2008; Hatcher, et. al., 2004). The following section summarizes several research studies that explored teachers' knowledge in relation to these areas of instruction.

<div align="center">**Teacher Knowledge and Early Literacy**</div>

In order to identify studies associated with teacher knowledge and early literacy instruction, a literature search was conducted using various electronic databases (i.e., ERIC, Academic Search Complete, EBSCO, PsycINFO, and Google Scholar). The following key words were used to identify studies published in peer-reviewed journals through the year 2017: "teacher knowledge in reading instruction," "teacher knowledge about National Reading Panel," "teacher knowledge in early literacy instruction," "teacher knowledge in phonemic awareness instruction," "teacher knowledge in phonics instruction," and "teachers' perceptions of knowledge in reading instruction." A review of the reference lists of retrieved articles was also completed in order to ensure a comprehensive collection of articles.

While several studies were conducted outside of the United States, investigations included in this review represent those completed in English-Speaking counties. A total of 16 studies were identified and divided into four key themes: (a) assessing teacher knowledge, (b) teachers' perceptions of their knowledge, (c) teacher knowledge and student improvement, and (d) increasing teacher knowledge.

Assessing Teacher Knowledge

Over 20 years ago, Moats (1994) initiated an investigation as part of a graduate course titled "Reading, Spelling, and Phonology" that was designed to teach basic language concepts related to reading instruction. An informal survey of linguistic knowledge was developed

specifically to assess the depth of teachers' linguistic knowledge and measured how well teachers understood: (a) sounds in speech and their identity in words, (b) connections between sounds and symbols, (c) concepts of language, and (d) recognition of morphemic units in words. While this information would eventually be covered as part of the course, the results of this survey drew attention to the complex task of teaching reading and the content knowledge experienced teachers often lack. As history would play out, Moats' assessment tool was used in subsequent research investigations and similar findings were obtained. Moats' seminal work in this area is often credited as the foundation for a trajectory of research in the decades that follow and for bringing awareness to this difficult situation facing teachers of reading.

Participating graduate students in this course were licensed teachers all having classroom experience ranging from 0 to 20 years. Moats (1994) described this group as professional, motivated, and knowledgeable, implying that the results of the survey may project an overly optimistic picture of teachers' knowledge. Unfortunately, the findings revealed that teacher knowledge about concepts related to language were inadequately developed, displaying a conceptual weakness in those skills deemed necessary for direct, language-focused reading instruction. Considering this group of teachers was described as among the best, the findings presented are of even greater concern.

For example, when questioned about terminology related to early literacy instruction, teachers surveyed were not aware that a difference existed between phonetics, phonology, and phonics, although exposure to the term phonological awareness was reported. Phonics knowledge was also reported as weak, as evidenced by many teachers' inability to identify a consonant digraph (i.e., two letters combined to form a new sound such as c-h /ch/) and only 10 to 20% of the teachers consistently able to identify consonant blends in written words (e.g., /bl/,

/st/). The relative strength of the group was reported on tasks requiring teachers to correctly identify syllables, with 77% of participating teachers being able to answer these items correctly. However, this reported strength is a relatively isolated skill, as the remaining items on the survey found teachers correctly completing questions at a success rate of 45% and lower (Moats, 1994).

The finding of Moats' (1994) study indicated that experienced teachers, and presumably the better informed, lacked a sufficient understanding of structures in both spoken and written language. Thus, with a weak understanding such as those found in this study, it is difficult to comprehend how teachers could teach these concepts explicitly to beginning readers or to those with any reading or spelling disabilities. This study not only highlighted the lack of knowledge among experienced teachers in relation to the language structures associated with early literacy instruction, but also the awareness that at the very least, a minimum level of language study is required for those individuals responsible for teaching early readers.

The findings of Moats' (1994) study gained attention from the American Federation of Teachers (AFT), a large teachers union, who subsequently published an article based on these survey findings to argue for better instruction for teachers (Moats, 1995). Thanks to this recognition, concerns regarding a lack of content knowledge among experienced teachers earned national attention. Interestingly, a few years later a congressional request was made to assemble the NRP for the purpose of evaluating research-based knowledge related to teaching children to read. As previously discussed, the findings of the NRP (2000) presented content knowledge critical for teaching reading, and through various partnerships, efforts were made to distribute these finding to teachers across the country.

For example, *Put Reading First: The Research Building Blocks for Teaching Children to Read* (2001) was published as a user-friendly document to present the findings reported by the

Panel, and at times was even accompanied by a professional development program. The commitment to ensure that all students learn to read continued through the authorization of the No Child Left Behind Act (NCLB) in 2002. Federal policy required states to set necessary structures to ensure all students learn to read by third grade. The recognition, attention, and pledge made for quality literacy instruction set an optimistic view for the future of teachers and students in the United States.

Despite the recognition that Moats' (1994) work received, and the firm commitment made to reading instruction, over a decade later results of a similar investigation revealed relatively little change in teachers' knowledge in another English-speaking country. Researchers created a tool based on Moats' Informal Survey of Linguistic Knowledge to survey 340 pre-service and practicing teachers in Australia (Barnsley & Purdie, 2005). Findings revealed the average score of the ten-question survey was 60%. Simpler tasks, such as identifying a word containing a short vowel sound or counting syllables, were the only two items found to be more successful among teachers, with both nearing 90%. As tasks became increasingly complex, teachers were found to be less successful. In fact, not one of the 340 teachers earned a perfect score, answering all ten items correctly. Of the reported subgroups, a slight variance was noted. For example, special education teachers reportedly scored the highest (i.e., earning a 73% success rate), general education teachers evidenced a 62% success rate, and pre-service teachers demonstrated a success rate of 54%.

This study not only reaffirmed the same concern with teacher knowledge initially reported in Moats' (1994) research, but also devoted attention to exploring teachers' attitudes towards reading and spelling instruction. Results of this inquiry found attitudes did not vary according to years of experience or additional qualifications held by participants. In fact, only

slight variations were found among special education teachers favoring a phonics-based approach over a whole language approach. While this exploration revealed that teachers overall had a positive attitude towards literacy instruction, the findings continued to reveal the same concern facing teachers in the United States, a deficiency of knowledge in language structures necessary for effective literacy instruction (Barnsley & Purdie, 2005).

A few years later in the United States, when federal initiatives to improve reading had been in place for some time, an investigation of preschool and kindergarten teachers' knowledge relating to early phonological awareness instruction was funded by the U.S. Department of Education (Crim, Hawkins, Thorton, Rosof, Copley, & Thomas, 2008). The Early Childhood C3 Coaching: Quality Professional Development Grant (Collegial, Cognitive, and Collaborative) team, also relying on Moats' (1994) *Informal Survey of Linguistic Knowledge* as a base, created a tool to assess the participants' knowledge of syllables, morphemes, and phonemes. While the intent of the pre-assessment was to gather knowledge of participating teachers' ability to identify language structures related to early literacy skills prior to a three-year professional development program, the results of this survey solidified the trend developing in studies of content knowledge among teachers of reading.

A total of 54 preschool and kindergarten teachers, with an average of 9 years, 8 months of teaching experience, served as study participants. Consistent with findings of earlier research (Moats, 1994; Barnsley & Purdie, 2005), of the three areas assessed, identifying syllables was the strongest. While teachers appeared to have a grasp of this concept in general, some items were still a struggle. For example, correctly identifying the number of syllables in the word *crocodile* and *attached* proved to be a challenge for 32.5% of the participants. Similarly, the task of identifying the number of phonemes in words was difficult for 40% to 85% of the participants,

and when it came to morphemes (i.e., small part of language that has meaning), 67% to 95% of teachers responded incorrectly on tasks requiring them to identify the number of morphemes in a word. In fact, 80% of early childhood educators in this study were unable to correctly identify the number of morphemes in a word (Crim et al., 2008).

While it was reported that teachers expressed a deep desire to support students' growth in early literacy skills, and shared much enthusiasm to expand their knowledge base, it is still of great concern that teachers are unable to identify syllables, phonemes, and morphemes. Over 10 years after Moats' (1994) landmark study, and the initiation of policy supporting reading instruction in schools, teachers were again found to be lacking knowledge necessary in phonological awareness, a crucial part in the process of learning to read. As such, the researchers recommended comprehensive and on-going professional development aimed at improving teachers' understanding of phonological awareness and the critical role it plays in early literacy development. While these findings most certainly call for action, more importantly is the recognition of a trajectory of findings that was developing over time. It is unfortunate that, despite the support through research and federal initiatives, this path has not improved for teachers even with initial discoveries taking place a decade prior (Crim et al., 2008).

In a related study, researchers examined 223 first-year special education, early childhood, and elementary education teachers' knowledge of phonemic awareness instruction (Chessman, McGuire, Shankweiler, & Coyne, 2009). The sample represented 15 teacher education programs across the United States. In this study, the researchers used the *Survey of Phonemic Awareness Knowledge and Skills* (*PhAKS)* to measure disciplinary knowledge. Participants were asked to complete 9 knowledge-related items and 6 skill-related items, totaling 15 items to assess phonemic awareness. Findings indicated a low level of knowledge and skill in the area of

phonemic awareness instruction, with participants earning an average score of 57%. In fact, of all 223 participants, only 3 earned a perfect score on the 15-item assessment. Skill-related items were reportedly slightly higher (i.e., an average 63%), while knowledge-related items averaged 53% across all participants. Through an analysis of the errors, the researchers were able to examine participating teachers' understanding of the difference between phonemic awareness and phonics. This investigation revealed substantial evidence to suggest the inability among study participants to distinguish between phonemic awareness and phonics. (Chessman, et al., 2009).

More recently, researchers conducted a related investigation by using a licensure exam called the *Foundations of Reading Test* to assess teacher knowledge (Swerling & Cheesman, 2011). Perhaps a deviation from Moats' (1994) original tool would produce different results. The exam used in this study focused on the five components of effective reading instruction deemed essential by the NRP (2000), phonemic awareness, phonics, fluency, vocabulary, and comprehension, with a concentration on both knowledge and application of content. A total of 152 elementary level teachers with varying teaching experiences from two states were selected to participate.

Reporting phonemic awareness and phonics together as one cluster, participants earned an average score of 61% correct and an average score of 65% correct on a second cluster, covering fluency, vocabulary, and comprehension. In keeping with earlier research (Moats, 1994; Barnsley & Purdie, 2005; Crim et al., 2008), error analyses indicated that experienced general and special education teachers were again lacking both content and application knowledge. For example, only 27% were successful at identifying words considered easy for phoneme blending activities. It is not surprising the application portion of the survey provided

the researchers an opportunity to see the pedagogical effects of a lack of content knowledge, something other researchers have suggested (Moats, 1994). For example, many participants did not recognize that first grade instruction should include opportunities for building accurate decoding. It was also reported that only one-third of the participants were familiar with the NRP report (2000), a disturbing trend when considering the tremendous impact the report had on reading instruction and the fact that it is often referenced in both scientific and educational literature. This lead the researchers to recommend that states begin using a similar tool such as the one used in this study, a research-based exam, to ensure teachers' content knowledge (Swerling & Cheesman, 2011).

Given the research presented, the concern Moats (1994) raised over 20 years ago still remains today. It is unfortunate that similar studies continue to reveal a deficiency among practicing teachers in skills deemed essential for early literacy instruction. While some studies found teachers could not complete the same tasks asked of their young students, others discovered teachers' inability to carry out instruction in keeping with research-based recommendations. Collectively, these findings represent that teachers continue to demonstrate low levels of content knowledge necessary for teaching children to read.

Teachers' Perceptions of their Knowledge

To further explore teachers' levels of content knowledge, researchers have investigated teachers' perceptions of their knowledge of literacy instruction (Cunningham, Perry, Stanovich, K., & Stanovich, P., 2004). The researchers define this as a teacher's capacity to calibrate their knowledge or an understanding of what they know and what they do not know. In a large study of 722 kindergarten through third grade teachers, researchers administered knowledge and perceptions surveys in three domains related to reading instruction.

In the first domain, teachers were assessed on their knowledge of children's literature. The study found that approximately 10% of the teachers were able to identify half or more of the most popular children's book titles, suggesting that 90% of teachers were unfamiliar with these titles. The surveys regarding teachers' perceptions revealed that participants were calibrated. In other words, those who perceived themselves as knowledgeable in children's literature scored high on measures of knowledge in this area (Cunningham et al., 2004).

Phonemic awareness, the second domain, was assessed using a tool similar to the *Informal Survey of Linguistic Knowledge* (Moats, 1994) previously discussed. Participants were asked to record the number of phonemes in 11 words and were provided directions with embedded hints for successfully completing this task. Unfortunately, results indicated that 20% of the teachers were unable to correctly identify the number of phonemes in any of the words, 30% could only identify half correctly, and less than 1% were able to identify all of the words correctly. On average, teachers answered only 4 of the 11 questions correctly. In contextualizing these findings, the researchers noted that the tasks in which participating teachers failed are the same as those typically asked of students in kindergarten as part of a beginning reading program. Even more surprising, the group of teachers who perceived themselves as having greater knowledge in phonemic awareness earned low scores on the measure of knowledge in this area. In other words, findings indicate that the teacher participants in this study were poorly calibrated in the area of phonemic awareness (Cunningham et al., 2004).

The final domain assessed in this study was teachers' implicit and explicit knowledge of phonics. For implicit knowledge, participants were asked to identify words with irregular spelling patterns, and only 11% of the participants could identify all of the 11 irregular words. For explicit knowledge in phonics, participants were asked to answer seven multiple-choice

questions in content knowledge of language structure. Findings revealed that only 28% of teachers were able to answer half of the questions correctly and again less than 1% of the participants answered all items correctly. As with children's literature and phonemic awareness, both of these phonics measures demonstrated that teachers are lacking crucial information needed to teach beginning reading. Similar results pertaining to participants' perceptions of their knowledge were again reported. Teachers rating themselves as having great knowledge in this area were found to have scored low on knowledge measures of both implicit and explicit knowledge of phonics suggesting that teachers in this study were poorly calibrated in the area of phonics (Cunningham et al., 2004).

These findings draw attention to an area in need of consideration, teachers who are poorly calibrated, or those with a sizeable discrepancy between their actual and perceived knowledge. Of this large sample, the majority of the teachers overestimated their knowledge in both phonemic awareness and phonics. The researchers addressed future implications, such as a teachers' receptiveness to learning new information, suggesting that those that overestimated their knowledge levels may not be open to acquiring new information. In contrast, those who are aware that their level of knowledge is weak would most likely take necessary steps to obtain new information (Cunningham et al., 2004).

As findings of this and other studies indicate (Moats, 1994; Barnsley & Purdie, 2005; Crim et al., 2008; Swerling & Cheesman, 2011), teachers are unfortunately lacking important content knowledge. These findings uncovered a concern that teachers with the lowest levels of knowledge may not be willing to take the necessary steps to increase their knowledge base. Researchers deem this concern as critical. An inability to recognize one's lack of content

knowledge has the potential to impede a teacher's ability to become open to new knowledge, take advantage of learning opportunities, and grow as a professional (Cunningham et al., 2004).

In a related study, researchers engaged in an examination of the knowledge and perceptions of pre-service (*n=*293) and in-service (*n=*131) general education teachers (Mather, Bos, & Babur, 2001). Knowledge was assessed using a tool based on Moats' work (1994), exploring language structure as it relates to reading development. In keeping with earlier studies (Moats, 1994; Barnsley & Purdie, 2005; Crim et al., 2008; Swerling & Cheesman, 2011), both pre-service and in-service teachers in this study were found to be lacking sufficient understanding of basic constructs of English language structures and had an incomplete understanding of phonics terminology. It is important to note that at the time of the study's publication, national attention to support reading instruction was strong. Despite this, subsequent studies that have been reported in this review, continued to find similar results.

In this investigation, the researchers paired teachers' beliefs with their level of knowledge and found discrepancies. Of the participating teachers, 97% of pre-service teachers and 100% of the in-service teachers believed that early literacy instruction should include phonological awareness. Despite this belief, data from the knowledge assessment indicated that only 22% of the pre-service teachers and 36% of the in-service teachers were aware that phonological awareness was a matter of oral language. The discrepancy reported in this study is a clear indication that teachers know what is important to address as part of early literacy instruction but do not have the necessary understanding to carry it out (Mather et al., 2001).

Teacher Knowledge, Skills, and Perceptions

In order to measure teachers' knowledge, skills, and perceptions of language and literacy constructs, a group of researchers sought to develop an assessment tool. In a series of studies, the

researchers developed and tested versions of the instrument with a variety of participants including college educators (Joshi, Binks, Hougen, Dahlgren, Ocker-Dean, & Smith, 2009), pre-service teachers (Washburn, Joshi, Binks-Cantrell, 2011a), and practicing kindergarten through 5th grade teachers (Washburn, Joshi, Binks-Cantrell, 2011b). In two of these investigations, the instrument was referred to generally as "a survey designed to assess knowledge and skill of basic language concepts" (Washburn et al., 2011a, p. 26; Washburn et al., 2011b, p. 170) and in the third, the title *Survey of Language Constructs Related to Literacy Acquisition* was used (Joshi et al., 2009).

Following these investigations, various adjustments were made to the survey and resulted in a revised version known as the *Basic Language Constructs Survey* (BLCS). The developers then completed a study to evaluate the psychometric properties of the tool (Binks-Cantrell, Joshi, & Washburn, 2012a). Subsequently, investigations using the BLCS have been conducted with college instructors and their students (Binks-Cantrell, Washburn, Joshi, & Hougen, 2012b) as well as pre-service teachers (Washburn, Binks-Cantrell, Joshi, Martin-Chang, & Arrow, 2016). The BLCS was the instrument selected for the present investigation examining the knowledge, skills, and perceptions of practicing parochial schools teachers. To contextualize the body of research associated with the survey, a description of the BLCS is provided, followed by a summary of findings of studies employing the various versions of the instrument. Additional information about the survey is presented in Chapter 3.

Basic Language Constructs Survey (BLCS)

The BLCS is a 46-item survey assessing teacher's perceptions, knowledge, and skills in early literacy instruction (Binks-Cantrell et al., 2012). As indicated, the developers sought to create a valid tool that could be used to assess teachers' knowledge based on their own pilot

studies and other surveys previously used in the field. As such, they created eights items to measure perceptions using a Likert scale. These items ask survey participants to evaluate their knowledge in phonemic awareness, phonics, fluency, vocabulary, comprehension, children's literature, teaching literacy to ELL students, and using assessment to inform instruction.

Encouraged by substantial results from skill-based items in Moats' (1994) tool, 26 questions of this type aimed at covering a range of skill levels with increasing difficulty were also included. Identifying the number of syllables and morphemes in a word is one example of this question type. Further, the team developed 12 questions to assess knowledge. Questions in this category ask survey participants to define terms such as phonological awareness and phonemic awareness. In addition to categorizing by kind (i.e., skill or knowledge), items are further categorized by type. For example, the survey consists of 8 phonological, 13 phonemic, 9 phonics, and 8 morphological items. Phonological items address sounds at a larger level while phonemic items at a smaller level, dealing with individual sounds. Phonics items focus on the rules related to letter-sound correspondences, or patterns in the written language, and morphological type items address the use of meaning to decode or comprehend (Cantrell et al., 2011).

Studies using previous versions of the survey. The first study employing a version of the survey investigated the knowledge among college instructors responsible for teaching early literacy content (Joshi, Binks, Hougen, Dahlgren, Dean, & Smith, 2009). Participants in this study were instructors of reading education courses offered to pre-service teachers. Of the 78 participants, 68 had doctoral degrees and the remaining 10 were in the process of earning the degree. It is important to note is that all participants were elementary school teachers prior to teaching at the undergraduate level (Joshi, et al., 2009).

To assess the instructors' disciplinary knowledge, participants were asked to complete the survey and rate their ability to teach various components of reading. Findings indicated that a majority of the instructors rated their ability as moderate, such that, they were not as confident in teaching the various components deemed critical for early literacy instruction. Survey items assessing content knowledge revealed low levels of knowledge among those who are perceived to be the experts in reading education. Of the areas assessed, participants earned a mean percentage correct of 78% in phonology, 56% in phonics, and 34% in morphology, thus, indicating phonology as a relative strength and morphology as a relative weakness. As the authors' noted, if the same standards used in many undergraduate programs were applied, these scores would not have been considered passing in the same teacher preparation programs. This variation of the survey included items assessing comprehension in which participants earned mean percentage correct of 58%. When compared with the BLCS, it is important to note that there were twice as many morphology-based items on this earlier version of the survey (Joshi et al., 2009).

A second study followed a couple of years later using a variation of the survey to investigate the knowledge of 91 pre-service teachers (Washburn, Joshi, & Cantrell, 2011a). These teacher candidates were enrolled in an undergraduate program preparing to teach general education students in grades kindergarten through fifth grade. Participants were given the survey at the beginning of a final of four total literacy courses required in the program. Since this final course covered the structure of the English language, the survey was administered prior to the start of the course. Five questions were also included to address dyslexia and a total of 17 items were included to assess morphology. This larger number of morphological-based items is consistent with the above-mentioned study. In other words, of all domains assessed with this

version of the instrument (i.e., phonological awareness, phonemic awareness, phonics, morphology, and dyslexia), the number of morphology questions was the highest (Washburn et. al., 2011a).

According to mean percentages correct, findings indicated that preservice teacher performed best on items related to phonological awareness (86%), followed by phonemic awareness (72%), phonics (45%), and morphology (50%). The researchers reported that participants perceived their knowledge in phonemic awareness and phonics as moderate and explain the lack of teaching experience as a possible reason for this weaker rating of actual knowledge. In addition to highlighting these low levels of content knowledge, this investigation also revealed that participants had inaccurate information regarding the cause dyslexia. Given the common misconception commonly associated with dyslexia, a large majority of the participants believed that dyslexia involved a visual component and were unaware that in fact it is a language-based issue (Washburn et. al., 2011a).

During the same year, the survey was administered to 185 practicing teachers (Washburn et. al., 2011b). It is important to note that nearly half of the participants were first year teachers, having had no prior teaching experience at the time of the study. Nearly 25% of the remaining sample had ten years or less of teaching experience. The version of the survey used in this study had the same variations of the preceding study, thus, it also included five items on dyslexia and expanded questions on morphology (Washburn et. al., 2011b).

Similar findings were reported with in-service teachers as in the previous investigation with preservice teachers. The two areas with the highest mean percentage correct were phonological awareness (86%) and phonemic awareness (68%), with phonics (52%) and morphology (53%) were rated the lowest of the four domains assessed. Participants in this study

also reportedly displayed the common misconception that dyslexia is a visual issue rather than a phonological one. Given the overall lack of experience among this group of teachers, the researchers pointed out that participants with more than five years of experience scored, on average, above 70% on phonemic awareness items thus, suggesting experience in the classroom may contribute to an increase in teachers' knowledge in this domain (Washburn et. al., 2011b).

Studies using the BLCS. Following the initial investigations of the survey summarized in the aforementioned studies, the developers evaluated the psychometric properties of their instrument, now referred to as the BLCS (Binks-Cantrell et al., 2012a). This can be considered an important development in this area of research since tools used prior to this study had not been examined in this manner. For example, Moats (1994) created the *Informal Survey of Linguistic Knowledge* and this tool or variations of it have historically been used to gauge disciplinary knowledge among teachers. However, no published research is currently available to document the validity and reliability of Moats' tool.

To examine the survey's psychometric properties, the researchers used a sample of 286 participants, 114 teacher educators and 172 pre-service teachers. This investigation involved exploring various factors to assess for psychometric properties. Item difficulty was examined and was found to have an overall mean for knowledge- and skill-based items at 0.63 (range 0.65 and 0.67), falling just slightly below the ideal level of item difficulty. If items on a survey are found to be too difficult or too easy, the tool is unable to measure individual differences among survey participants. The researchers noted that items on this survey with five or six answer choices contributed to the overall strength in item difficulty. Item discrimination was also examined using a discrimination index and results indicated that 30 of the 38 knowledge and skill questions fell in the range of 0.30 to 1.00. When examining item discrimination, an index score of 0.30 to

0.39 is considered reasonably good and 0.40 and above is considered very good. Item

discrimination is important as it also contributes to categorizing between higher and poorer

achieving participants (Binks-Cantrell et al., 2012a).

The investigation of the BLCS also examined the reliability of the measure. The

researchers found the instrument's reliability to be exceptionally high, with an overall score of

.90. In fact, a measure with a reliability score over .80 is considered appropriate for research

purposes. Researchers describe this rating of .90 as an indicator of high internal consistency

among the scores. Internal consistency is important as it demonstrates consistency and

uniformity among constructs, or subject matter measures (Creswell, 2014). The researchers

concluded that the high reliability of the measure should serve as encouragement for use of this

survey in future research. While the primary purpose of the Binks-Cantrell et al. (2012a) study

was to investigate reliability, the researchers also identified strong evidence for the validity of

the instrument, most notably construct validity. Creswell argues that of the three forms of

validity, construct validity is the overarching objective of validity and describes this form of

validity as the one with a focus on serving a useful purpose in practice.

In addition to using the sample of college instructors and pre-service teachers to evaluate

the psychometric properties of the BLCS, the researchers also reported the findings as they relate

to participants' knowledge and skills associated with basic language constructs in a separate

study, with special attention to the role of professional development (Binks-Cantrell et al.,

2012b). College instructors responsible for teaching reading education courses made up two of

the four groups included this study. One group of teacher educators received three years of

professional development programming aimed at research-based reading instruction ($n = 48$),

while a second group of teacher educators ($n = 66$) did not participate in this professional

development. Pre-service teachers subsequently made up the remaining two groups of participants; pre-service teachers taught by instructors who received professional development and ($n = 55$) and those pre-service teachers whose instructors who did not participate in professional development ($n = 118$).

Findings of this study indicated that teacher educators who participated in professional development (PD-TE) had higher mean percentages correct in all domains when compared with those teacher educators who did not participate in the professional development (NPD-TE). Further, preservice teachers who were taught by PD-TE outperformed those who were taught by NPD-TE. The researchers labeled their findings as the *Peter Effect*, such that, those teacher educators without sufficient knowledge of basic language constructs are unable to pass the necessary knowledge needed for reading instruction to the preservice teachers in their courses (Binks-Cantrell et al., 2012b).

In the final study, researchers examined preservice teachers' knowledge of basic language constructs necessary for early literacy instruction using the BLCS in four English speaking countries (Washburn et al., 2016). Included in the sample were 80 participants from Canada, 55 from England, 26 from New Zealand, and 118 from the United States. Surveys were purposely administered at the middle or end of participants second course in reading education. Researchers stated that it was important examine this knowledge after the completion of course work rather than prior to receiving any reading education instruction.

Using the same standards as many university teacher preparation programs, researchers identified 70% as the cut off score such that any participant earning below a 70% was considered to have failed the survey. Unfortunately, findings revealed that participants from all four countries earned an average score of below 70%. According to the standards set forth by

researchers and those commonly used in teacher preparation programs, candidates in all countries failed to pass this survey. Findings revealed that pre-service teachers from Canada earned the highest score, with an average mean score of 67%, and pre-service teachers from England scored the lowest (49%). It is interesting to note is that course work in Canadian teacher preparation programs expose participants to focused instruction in basic language constructs and could account for the higher score earned by the Canadian participants (Washburn, et al., 2016).

A closer look at survey items among all four English-speaking countries, found that participants scored higher on skill-based items (59%) over knowledge-based items (48%). When viewing results by country, higher performance on skill-based items was consistent among all four countries. Survey items are further broken down by domain (i.e. phonological, phonemic, phonics, and morphological). Overall, study participants did best on phonological items and scored the lowest on morphological items. Teachers in the United States who participated in this study did best on phonological items, followed by phonics and phonemic items, and scored the lowest on morphological items. In keeping with guidelines set by researchers, none of the domains reached the 70% cut off score that would indicate a passing score (Washburn, et al., 2016). In the following section, studies that examined the impact of teacher knowledge on student improvement are summarized.

Teacher Knowledge and Student Improvement

The impact of teacher knowledge as it relates to student growth was examined in three studies. In the first, the researchers explored teachers' knowledge about reading fluency, one of the essential components recommended in the NRP (2000) report. Specifically, the researchers were interested in examining fluency as it relates to student growth in reading rate and accuracy (Lane et al., 2008). A total of 133 teachers, ranging from kindergarten through third grade, were

surveyed using five open-ended questions about reading fluency. Student data was gathered using two subtests of the *Dynamic Indicators of Basic Early Literacy Skills* (DIBELS) test, specifically the Nonsense Word Fluency (NWF) and the Oral Reading Fluency (ORF) subtests (Good & Kaminski, 2002). The Peabody Picture Vocabulary Test (PPVT) was also administered to participants (Dunn, 1981).

General findings indicated that teachers who had greater knowledge about reading fluency had students who read more quickly and accurately, both skills which are indicators of fluent reading. Results of this investigation also suggested that first grade students placed in classrooms with teachers who knew more about the importance of reading fluency, the skills that contribute to fluent reading, and instructional methods for improving fluency, finished the year with greater fluency than students placed in classrooms with teachers who were less knowledgeable (Lane et al., 2008).

Interestingly, growth in specific areas of fluency also appeared to be linked with developmental factors. The researchers suggested that there was a developmental pattern at play because the effect of teacher knowledge appeared to be the greatest in areas in which students are expected to make the most gains. The third-grade sample, which found smaller effects, is an example of this developmental pattern. Since fluency growth begins to level off due to a greater emphasis placed on comprehension and less on fluency, smaller effects make sense in third grade. In contrast, in first grade, when much decoding growth is expected and comprehension is emphasized less, it was reported that students who had teachers with greater knowledge about fluency scored better on measures of decoding rate and accuracy.

The researchers also examined the relationship between teacher knowledge and the effects of this knowledge on student improvement. Through a close examination of measures of

fluency, it was discovered that teacher knowledge could positively impact the fluency growth of students. This effect was found to be at its greatest when aligned with developmental patterns related to fluency development (Lane et al., 2008).

A second study investigating the impact of teacher knowledge on student improvement did not reveal a relationship between the two, or any substantial evidence indicating teacher knowledge contributes to student growth (Carlisle, Correnti, Phelps, & Zeng, 2009). However, the findings of this study did provide some valuable insights. As part of the state of Michigan's *Reading First* initiative (Armbruster, Lehr, Osborn, & Adler, 2001), a federally funded high quality professional development program aimed at improving teachers' reading instruction, 977 first through third grade teachers participated in a study exploring the influence of teachers' knowledge about reading instruction on students' improvement in reading.

The value in this study lies in two potential reasons for the study's shortcomings that were offered by the researchers. The first limitation was related to the tool used to measure teachers' reading knowledge. The *Reading First* professional development sessions were based on a program called *Language Essentials for Reading and Spelling* (LETRS). A three-part test aligned with the LETRS program, *Language and Reading Concepts* (LRC), was used to assess participants over the course of an academic year. The researchers reported the content of this assessment tool and its alignment with the purpose of the study as a limitation. Although the tool covered key components of reading instruction as prescribed by the LETRS program, a rather large emphasis was placed on basic linguistic knowledge. This limitation lies in using an assessment that focuses on one component, language concepts as it relates to reading instruction, over other components that contribute to reading instruction. The researchers identified this issue, the content of measures similar to LRC and the measure's ability to sufficiently sample

teachers' knowledge about reading, as an issue worthy of additional attention (Carlisle et al., 2009).

A second limitation addressed by the researchers was related to the alignment of the professional development program's curriculum and the student assessment chosen to measure the influence of teachers' knowledge. Schools in Michigan using *Reading First* were bound to benchmark and program guidelines that parallel the curriculum. That said, the student assessment tool used in this study, the Iowa Test of Basic Skills (ITBS), is not reflective of the *Reading First* curriculum. Researchers reported this as a potential roadblock, with the ITBS subtest having no connection to the *Reading First* curriculum. In other words, it is conceivable that the contribution of teachers' knowledge to student reading performance may have been inadequately represented. As such, issues of proper alignment when studying teacher knowledge and its impact on student growth as reported in this study should be taken into consideration for future research (Carlisle et al., 2009).

Another study, in which half of the participants were also involved in a *Reading First* program in Florida, explored the impact of teacher knowledge and classroom practices on student outcomes (Piasta, Connor, Fishman, & Morrison, 2009). In this study of 42 first grade teachers, the researchers sought to explore teachers' knowledge, the relationship with explicit decoding instruction, and any direct effects on student word reading gains. To assess the knowledge of participating teachers, researchers used *Teacher Knowledge Assessment: Language and Print*. The instrument was designed to assess teachers' understanding of phonology, orthography, morphology, and concepts related to literacy acquisition and instruction. Findings indicated that teachers on average answered 52% of the items correctly. To supplement this assessment, a total of three classroom observations over the course of an

academic year were used to gather data on participating teachers' explicit decoding instruction. A total of 619 first grade students participated and were assessed using the *Woodcock-Johnson Test of Achievement* (Woodcock et al., 2001). Data from a fall and spring assessments were used to measure student growth over the course of one academic year (Piasta et al., 2009).

While no evidence was reported indicating teacher knowledge directly affected students' reading gains, the researchers reported a valuable insight between teachers' knowledge and the explicit decoding instruction students in their classrooms received. Specifically, findings revealed that instruction provided by teachers with higher levels of knowledge was significantly more effective in improving growth in word reading among students when compared with those teachers with low levels of knowledge. Researchers reported such instances where teachers with lower levels of knowledge were unable to respond and correct students appropriately during explicit instruction in decoding. In addition, reports of teachers providing inaccurate examples when trying to assist students further supported how low levels of knowledge negatively impacted instruction. This led the researchers to conclude that the quality of instruction as it relates to decoding was influenced by teacher knowledge, thus, influencing word-reading gains of students in first grade (Piasta et al., 2009).

The impact of teacher knowledge on student improvement can manifest itself in various ways, not only through the use of test scores as noted in the previous studies (Lane et al., 2008 & Carlisle et al., 2009). In a study of 102 general and special education teachers, researchers explored teachers' allocation of time in a two-hour block reserved for language arts instruction that included both reading and writing (Swerling & Zibulsky, 2013). The purpose of this study was to evaluate teachers' time allocation in respect to their knowledge of research-based

recommendations, specifically the five essential components of effective reading instruction deemed critical in the report of the NRP (2000).

Findings indicated that teachers who participated in this study allotted zero or minimal instructional time toward phonemic awareness or phonics instruction. As recommended by the NRP (2000), phonemic awareness and phonics are both essential components of early literacy instruction. Students placed in classrooms with teachers who are unaware of the importance of these skills and do not devote instructional time towards them will have a negative impact on student's growth in reading. When students are not provided instruction in both, the ability to advance in the acquisition of these early literacy skills is impossible (Swerling & Zibulsky, 2013).

The researchers in this study used participants' data from a knowledge survey in a previous study (Swerling & Cheesman, 2011) as a source of information. They found that participants with higher levels of knowledge in both phonemic awareness and phonics were more likely to allocate time in their prescribed two-hour block consistent with research-based recommendations. Findings presented both sides, teachers who lack necessary content knowledge put students placed in their classroom at risk, while those teachers possessing high levels of content knowledge are more likely to provide students instructional time in keeping with research-based recommendations (Swerling & Zibulsky, 2013). In the following section, studies that examined attempts to increase teacher knowledge are explored.

Increasing Teacher Knowledge

Research has shown that teachers are lacking crucial knowledge as it relates to literacy instruction (Moats, 1994; Barnsley & Purdie, 2005; Crim et al., 2008; Swerling & Cheesman, 2011) and with this comes potential consequences for the students placed in these teachers'

classrooms (Lane et al., 2008; Swerling & Zibulsky, 2013). In further exploring teacher knowledge, two studies were identified that investigate attempts to increase content knowledge among teachers. The first study evaluated an intensive professional development program and the impact it had on first grade teachers' knowledge in reading instruction (Brady et al., 2009). A total of 65 first grade teachers took part in a two-day intensive professional development summer workshop. This workshop provided participants with an overview of research as it relates to reading development and heavily addressed content knowledge in phonemic awareness and phonics. In addition, each teacher was assigned a mentor who visited one day a week during the school year to provide support uniquely adjusted to meet the needs of each participant. Mentors also had a part in designing subsequent professional development workshops that took place during the school year, such that a connection between the content and the application of the content was visible throughout this intensive program.

Participating teachers were assessed using a teacher knowledge survey addressing concepts related to reading, specifically phonemic awareness and phonics. Prior to the year of the professional development, teachers were on average 38% correct on the phonemic awareness portion of the survey and 48% correct on the phonics portion. At the conclusion of the program, it was reported that teacher knowledge improved, teachers were on average 70% correct on phonemic awareness concepts and 80% correct on phonics concepts. This intensive professional development with the support of highly knowledgeable mentors contributed to an increase in teacher knowledge (Brady et al., 2009).

As part of this study, participants were also asked to complete a survey for the purpose of exploring significant changes in attitudes as part of this professional development program. Researchers reported that teachers who appeared to be using this professional development

program as a way to earn continuing education credits, an external motivator, were found to learn less of the content. It was also reported that attitudes towards the professional development program varied between new and veteran teachers. New teachers welcomed this professional development opportunity to learn the content and teaching methods offered in phonemic awareness and phonics. Veteran teachers, on the other hand, reported finding no value in the professional development opportunity, thus, impacting the acquisition of necessary content knowledge and teaching methods presented in the professional development opportunity. This research reveals that attempts to increase teacher knowledge can be impacted by attitudes of participating teachers (Brady et al., 2009).

A second study provided another opportunity to examine increasing teacher knowledge through professional development, but on a smaller scale (McCutchen, Green, Abbott, & Sanders, 2009). Teachers in grades 3 through 5 participated in a 10-day summer institute that committed much time to deepening teachers' understanding of phonology and phonemic awareness and the role they both play in reading instruction. Three, one-day professional development sessions designed to respond to teachers' needs that arose throughout the year were also provided. In addition, participants were offered visits from the researchers for consultation, observation, and assessment purposes. The content of subsequent professional development sessions was reflective of the participants' feedback during these visits (McCutchen et al., 2009).

The researchers chose to use an alternative form of the *Informal Survey of Linguistic Knowledge* (Moats, 1994) to assess participants' knowledge, since increasing teacher's linguistic knowledge was a goal of this program. They reported significant increases in participating teachers' linguistic knowledge as a result of the summer institute. The findings presented reveal that teacher knowledge can increase over the course of an academic year through professional

development opportunities supported throughout the year with ongoing visits from knowledgeable mentors (McCutchen et al., 2009).

In addition to the increase in teacher knowledge, the researchers in this study also discovered connections to student growth. In comparing control classrooms (i.e., those that did not have teachers participating in the summer institute) with intervention classrooms (i.e., those with teachers participating), it was found that students in the intervention classrooms outperformed peers in the control classroom. Furthermore, findings of this study illustrated that lower performing students appeared to have gained the most from their teacher's participation in the program. Researchers confirmed that the linguistics knowledge of teachers in the program had a measurable effect on the achievement of the lowest performing students. Overall, teachers who were participating in this professional development institute not only found growth themselves, but were also found to have an impact on their students' growth as well. This proved to be even greater for those students who typically struggled in reading (McCutchen et al., 2009).

This study adds to the earlier research (Brady et al., 2009) indicating that teacher knowledge can increase through focused professional development with on-going classroom support for participants. The effect of this increase in knowledge also found its way to the students who were placed in participating teachers' classrooms. A notable highlight of this piece speaks to the effect this intervention had on the lowest performing students. Those students who struggle the most with reading made the most gains. In the following section, discussion of future research will be addressed.

In the final study, researchers investigated growth in self-efficacy, perceived, and actual knowledge of phonemic awareness instruction among 54 teacher candidates engaged in a practicum experience at a Canadian university using a pre-, post-test design (Martinussen,

Ferrari, Aitken, & Willow, 2015). Participants in this study were asked to rate their knowledge in phonemic awareness, phonemic awareness assessment, and the link between phonemic awareness and reading development. In addition, they were asked to rate their exposure to instruction in phonemic awareness. To assess participants' self-efficacy, candidates were asked to evaluate their ability to implement instruction in phonemic awareness. Content knowledge was assessed using a multiple-choice survey, with four items focusing on phonemic awareness skills and eight addressing knowledge of phonemic awareness (Martinussen et al., 2015).

Results from the initial battery of assessments indicated that participants scored higher on skill items over knowledge items, but in general demonstrated low levels of knowledge in phonemic awareness. In fact, candidates on average earned only 56% correct on the content knowledge portion of this measure. In rating their perceptions, a majority of the candidates acknowledged a lack of knowledge in the area phonemic awareness. In fact, the measure used to assess self-efficacy indicated that only 21% reported themselves having a high level of competence in teaching phonemic awareness (Martinussen et al., 2015).

After completing the initial battery of assessments and as part of the study, participants received a multimedia lecture focusing on phonemic and phonological awareness. The lecture was designed to: a) define both and address common misconceptions between the two, b) provide explicit instruction and key terms in phonemic awareness instruction, c) activate knowledge of phonemic awareness through self-assessment, d) provide examples of teachers teaching phonemic awareness concepts, and e) offer opportunities for candidates to engage in dialogue, self-check, and discussion. A highlight of this lecture was use of video clips showcasing effective teaching practices in both phonological and phonemic awareness. In

addition, activity-based and discussion-based tasks were organized for participants to complete (Martinussen et al., 2015).

Post-assessment data indicated that the multimedia lecture had a favorable impact on increasing knowledge in phonemic awareness among participants. Candidates' average score increased from 56% to 71% correct, indicating that growth in this content knowledge can increase over a relatively short period of time. In the areas of perception and self-efficacy, limited findings indicated those with greater exposure to phonemic awareness instruction during practicum experiences rate their level of knowledge as higher that those with limited exposure. Further, this perceived knowledge positively related to their self-efficacy for teaching phonemic awareness. These findings further confirm low levels of disciplinary knowledge among preservice teachers but also demonstrate that low levels of disciplinary knowledge can increase over short time spans (Martinussen et al., 2015).

Summary of Findings

Federal initiatives, coupled with supporting structures that advocate for reading proficiency for all children and the literature examined in this review, offer some general conclusions on teachers' knowledge as it relates to literacy instruction. Approximately 20 years ago, the United States made a commitment to provide support in various capacities to ensure that all children learn to read. This commitment resulted in the influential reports of *Preventing Reading Difficulties in Young Children* (1988), the *National Reading Panel* (2000) report and the *No Child Left Behind Act* (2002). The report of the NRP is especially important for those responsible for teaching children to read, as it defined five areas critical for effective reading instruction with a clear deadline (third grade) established through later legislation (No Child Left Behind, 2000). Conclusions drawn from Chall's *Stages of Reading Development* (1983) support

third grade as a developmentally appropriate time to expect children to have mastered the skills

necessary to read. Theoretically speaking, this is a time when children make the shift from

learning to read to reading to learn. Given the federal supports and theoretical underpinning, it is

clear that teachers have been provided the content necessary to teach children to read.

Given the importance of having adequate disciplinary knowledge, it was necessary to

review the literature. Investigations revealed that teachers are lacking the critical content

knowledge required to effectively teach beginning reading. Studies revealing these deficiencies

were reported during the years prior to inception of the federal initiatives and up to ten years

after federal support for ensuring all children learn to read had been in place. Additional research

reviewed found that gaps in teachers' content knowledge could have an impact on student

achievement.

On the other hand, it was promising to find that research-rich professional development

opportunities, supported by highly knowledgeable mentors, contributed to improvements in

teachers' knowledge. In a general sense, the review of literature indicated that for the past 20

years, measures assessing disciplinary knowledge as it relates to early literacy instruction

consistently demonstrate gaps in teachers' knowledge and skills. The consequences are at the

expense of the student and the chances for improvements are based on a teachers' willingness to

do so.

This review also explored the limited research on the role of perceptions among

practicing teachers. Researchers in both of the available studies addressed implications for

teachers who have overestimated or underestimated their level of disciplinary knowledge. This

evolving theme is worthy of further investigation. Given that over the past 20 years research

continues to find teachers lacking disciplinary knowledge even with a national commitment to

support reading instruction, further inquiry of the role teachers' perceptions play in this knowledge may provide insight to this lingering problem. At the very least, an inquiry of this nature can begin to provide some explanation as to why teachers continue to lack disciplinary knowledge in reading instruction. Therefore, the purpose of the present study is to explore the disciplinary knowledge and perceptions of in-service parochial school teachers as it relates to the basic language constructs that are essential for early literacy instruction.

CHAPTER 3

METHODOLOGY

Research Project Background

This study is rooted in a partnership between an educational foundation and private university. The university and the foundation share the same religious affiliation. The mission of the foundation is to serve the parochial schools of its respective religious affiliation within a large urban Midwestern city in the United States. Founded in 1993, the foundation is fueled by its mission to change the lives of underprivileged children by supporting the needs of the parochial schools they attend. There are a total of 22 schools of this religious affiliation in the city, and the foundation currently supports all of the schools in varying capacities, including but not limited to: 1) providing requested educational materials, 2) offering administrative and teacher professional development opportunities, 3) funding scholarship for students, 4) providing consulting services, and 5) assisting with building maintenance in the schools. The partnering university is a four-year private, liberal arts-based university. The university is small in size, with 5,500 undergraduate and graduate students. Of the total enrollment, just over 4,000 are graduate students.

The foundation and university have a long history of collaborating based on their respective faith and missions. Over the years, the university community has also supported the K-12 schools that the foundation serves. Over a year ago, the foundation approached the university with a request to formally enter into a partnership. This was prompted by the launch of a three-year initiative supported by a large grant from a donor to revitalize the schools. This initiative was in response to challenges many of the schools were facing, with the majority of schools currently at a pivotal point and with their existence is in jeopardy. For example, many of

the schools are experiencing decreasing enrollment and difficulty retaining students. In fact, two of the schools, one high school and one elementary school, had to close their doors.

The foundation recognized that if private schools in this larger urban area are to remain competitive and viable, options for students and the quality of the education needs to improve. Therefore, through this initiative, the foundation is committed to improve the quality of education provided in the schools. It is the goal of the foundation to empower these schools to deliver an innovative and high-quality education to the students they serve. It was made clear that the support and development of school leaders and teachers are at the center of this initiative. The university co-constructed a program with the foundation that was designed to meet the unique needs of the principals. Therefore, year one of this three-year initiative focused strictly on school leaders, whereas year two marked the beginning of the teacher development portion.

The creation of this partnership also involved naming a university member to serve in the role of liaison between the university and foundation. This individual is responsible for coordinating and overseeing the school leader and teacher development program. In addition, this role requires interactions with the principals and teachers through school visits and foundation supported events, with the primary purpose of gaining a better understanding of the challenges the schools are facing. These visits and events assist the university in understanding the types of support they can offer. It is important to note the principal investigator of the present study currently serves as the liaison between the foundation and university.

Prior literacy support. As stated earlier, prior to formal formation of a partnership, the university supported the schools served by the foundation in various capacities. For example, the foundation solicited the assistance of the university in delivering one of their largest professional

development opportunities offered to their teachers. In this instance, the foundation chose a topic and offered five, two-hour professional development sessions over the course of the academic year on the university's campus. During the 2016-17 academic year, the foundation requested that the university provide assistance to create and deliver another cycle of this long-term professional development.

The topic selected was literacy essentials to build teachers' foundational knowledge in teaching reading. The goal was to strengthen participating teachers' understanding of the five essential elements of effective instruction suggested by the National Reading Panel [NRP] (NRP, 2000). The foundation offered this free professional development to teachers in all 22 schools, which included approximately 150 teachers, and roughly 40 to 50 teachers from preschool through eighth grade elected to participate. This professional development was designed and delivered by the university with each session following a similar format.

All five sessions began with sharing the general findings of the NRP including: 1) NRP identified phonemic awareness, phonics, fluency, vocabulary, and comprehension as essential elements critical for effective instruction in reading; 2) learning to read is a combination of all five areas of instruction; and 3) all five areas are interconnected and the emphasis on each vary by grade level. Following this introduction, the session followed with a deeper look at the element assigned to the session. The schedule of topics for the five sessions included: 1) affective factors, 2) phonemic awareness and phonics, 3) fluency, 4) vocabulary, and 5) comprehension. This deeper look provided teachers with a theoretical understanding of each component of instruction as well as practical applications for the classroom.

In addition to funding the professional development (e.g., educational materials, scholarship opportunities, consulting services), the foundation purchased an accompanying

textbook for participating teachers, which was recommended by the university. The textbook, *Improving Reading: Strategies, Resources and Common Core Connections* (Johns & Lenski, 2014), addressed each of the essential elements of literacy instruction with each one assigned a chapter. These chapters included a brief and easy to read theoretical summary, followed by a catalog of instructional strategies for the element. The text was integrated in the professional development session to help teachers become familiar with using it.

The foundation also provided each teacher participant with a one-hour, school visit from a literacy coach. While the one-hour coaching session was intended to be focused on the use of information and text from the professional development session, participating teachers were free to use the coaching visit to address any specific needs related to reading instruction in their classrooms. The foundation reported that reviews from participating teachers on this professional development program and the accompanying coaching visits were favorable.

Year two initiative. To address teacher development in year two, the foundation agreed to support a program designed by the university to deliver professional development and coaching for one year. Similar to the principals, teachers in these schools carry the burden of many responsibilities with little support. For example, many of the teachers are with their students the entire school day and are not afforded the luxury of a planning or lunch period. Many of the schools offer before and after school programs, which are often supervised by teachers. In fact, one of the schools hosts students as early as 6:30 a.m. until as late as 6:30 p.m. daily.

Many of the supports typically provided to public school teachers are not available to these teachers. For example, support services offered by professionals such as reading specialists, speech teachers, or special educators are frequently absent in many of these schools.

To address these needs, minimal supports in these areas are offered through the foundation. For example, a special education consultant funded by the foundation works with all 22 schools to help teachers with students who may require special education services or educational supports.

The foundation identified literacy curriculum and instruction as the goal for the current year's initiative of the teacher development program. The partnership recognizes the demands faced by teachers and aim to deliver a program that meets the unique needs of each school. Plans include weekly visits to each school by an instructional coach, development of curriculum, and monthly professional development sessions held on the university campus. The program is currently underway. While the foundation provides many supports similar to what a district office in a public school might offer, it is important to note that the foundation does not have the same jurisdiction that one might expect of a district office. Schools do not have to participate in any of the programs offered by the foundation; however, many of the schools do chose to be included.

As stated earlier in this section, the principal investigator of this study is currently employed by the university to serve as its liaison to the foundation in order to manage the partnership. This role as liaison has afforded the opportunity to visit many of these schools, get to know the principals, and work with many of the teachers in various capacities including delivering professional development, assisting with technology use during reading instruction, and selecting educational materials. Engaging in these activities has allowed the principal investigator to witness first-hand the dedication of many of the teachers and principals who work in these schools as well as the commitment of the foundation to revitalize the schools as innovative institutions of high quality education.

Participants

Convenience sampling was used in this study. Approximately 100 in-service urban, parochial school teachers from a large metropolitan city in the Midwestern United States were invited to participate in this study. Participants were recruited from a full day professional development session held prior to the start of a new school year at a parochial school just outside of the city. The principal investigator completed all necessary documents and gathered consent letters from the university (the principal investigator's employer) and foundation as requested by the Institutional Review Board (IRB). Approval was granted through the IRB prior to conducting the study. A total of 65 teachers elected to participate in the study and completed the survey. Included in this sample were preschool through eighth grade teachers.

Procedure

This professional development day was hosted by the educational foundation. The setting was familiar to many of the participants, as this school has housed this annual professional development session for many years. In fact, the majority of these teachers have become accustomed to beginning every academic year by attending this event at this school. All 22 schools were invited to this full day professional development session and school principals and teachers were expected to attend. Typically, several breakout sessions are available for teachers to choose from. However, due to the three-year initiative and the establishment of the formal partnership with the university, the foundation chose a different format for this year's event. The morning kicked off with opening remarks by the foundation's executive director and the university's vice president focusing on the initiative and the partnership.

After these introductory remarks, the first round of breakout sessions took place. All early childhood centers in this network of 22 schools participated in a session led by a university

representative with early childhood expertise. The remaining schools, most serving preschool through eighth grade, met as individual faculties. The purpose of these sessions was for principals to share their recently created strategic plan for their school, as year one of the initiative focused on assisting school principals in the creation of these plans.

The special education consultant led the second part of the day. All participants returned together for a brief session focused on the topic of progress monitoring, with the specific goal of providing a clear definition and purpose for this process. It is important to note that these parochial school teachers are not bound to the same initiatives (e.g., Response to Intervention) as the public schools. However, because some students in these schools receive special education services through local public schools, the teachers are required to produce data from progress monitoring measures for these students.

After this brief session, teachers moved to individual rooms based on grade level. The purpose of this breakout sessions was to train teachers on how to conduct progress monitoring for their students and methods for recording the data. The consultant had selected a free online tool for teachers to use to complete progress monitoring and the foundation has asked the university to support teachers in learning the process involved. Therefore, the university provided literacy coaches to lead these breakout sessions and ultimately provided teachers expert guidance in this area. Lunch was provided to participants following this second session and served as the final activity of the day.

As the liaison for the partnership, the principal investigator had a role in planning, advising, and coordinating of university resources to support the requested needs of the foundation for this full day professional development session. However, on the day of this session, the principal investigator assumed the role of researcher, observing the opening remarks

in the morning session and visiting each breakout session for brief observations as time permitted. Data collection took place in the second session when teachers gathered in a common area prior to break out sessions. This arrangement allowed the principal investigator to be actively involved in distributing the surveys, proctoring the group of teachers, and addressing individual questions of participants.

Specifically, teachers attending a full day professional development session were recruited to participate in this study. Prior to the start of the second session, the principal investigator recruited participants using a script that provided a brief rationale for the study, procedures for obtaining consent, and necessary details that helped teachers gain a clear understanding of the process that was used to complete the survey. Teachers were informed that participation in the study was voluntary and that electing to participate or not would not impact standing in their school or with the foundation-university partnership. Given that teachers involved in the foundation-university partnership have participated in research investigations in previous years, it was anticipated that a high number of individuals would consent to participate in the current study.

After a brief presentation by the special education consultant, teachers were instructed to move to the adjoining common area to complete the survey prior to leaving for breakout sessions. Teachers who chose to participate in the study read and signed the consent form, completed the cover page requesting demographic data, and the 27-item BLCS. Those electing not to participate moved directly to the breakout room for their grade level meetings. Given that the survey was completed during a transition between conference sessions and there was a large number of individuals moving throughout the rooms at this time, it was not obvious who elected to participate or not.

It took approximately 20 minutes for teachers to complete the paper and pencil version of the survey. During this time, the principal investigator walked around to monitor the room and was available for any questions about the research study. The principal investigator could sense some frustration on the part of the participants, but there were no questions asked. Upon completion of the survey, teachers were instructed to move to their breakout rooms.

Measure

Previous research to investigate teachers' knowledge in reading instruction has involved instruments that have not been evaluated in regards to their psychometric properties. As discussed in Chapter 2, several studies evaluating teacher knowledge have used Moat's *Informal Survey of Linguistic Knowledge* or variations of it (Moats, 1994; Barnsley & Purdie, 2005; Crim et al., 2008, Cunningham et al., 2004). For this study, teachers were asked to complete the *Basic Language Constructs Survey* (BLCS), an assessment created specifically to assess teachers' knowledge of basic language constructs that are essential for early reading instruction (Cantrell, Joshi, & Washburn, 2011). This knowledge is especially important for teachers of early literacy (preschool through second grade) as well as teachers in grades three and higher who may be required to assist students experiencing reading difficulties. The principal investigator secured permission from the authors to use the survey in this investigation.

Unlike any other tools previously used in examinations of teacher knowledge as it relates to early literacy instruction, the BLCS has been evaluated through a rigorous examination (see Chapter 2). Findings revealed this instrument to have ideal levels of item difficulty, reasonably good to very good levels of item discrimination, exceptionally high levels of reliability, and strong evidence of construct validity. Within their article, the researchers drew attention to the need for this tool to be administered to in-service (i.e., practicing) teachers across a variety of

grade levels. Administering this survey to in-service teachers serving students at various grade levels could reveal differences among grades and other variables that the authors believe are important to generalize the standardization of the measure (Cantrell et al., 2011). This rigorous examination that has been completed for this survey, coupled with the need for use among varying grade levels of in-service teachers, made this survey an ideal tool for the present examination of teachers' knowledge in early literacy instruction among parochial school teachers.

The BLCS is a 27-item assessment, but it has a total of 46 responses to be scored and evaluated. The first eight questions assess teachers' perception of their knowledge in various areas of reading instruction. Included are the five areas of effective reading instruction recommended by NRP (i.e., phonemic awareness, phonics, fluency, vocabulary, and comprehension) as well as other areas such as assessment and instruction with special populations. Using this survey, teachers were asked to evaluate their knowledge using a 4-point Likert scale to indicate minimal, moderate, very good, or expert knowledge in each of these areas (Cantrell et al., 2011).

The remaining items assess teachers' knowledge and skills within four different domains including phonological awareness, phonemic awareness, phonics, and morphology using 12 knowledge-based items and 26 skill-based items. For example, teachers were asked to define phonics as part of a knowledge-based question and to count syllables in a word in a phonological awareness skill-based question. Responses to individual items are then categorized into the following four areas: 1) 8 items that involve perceiving or manipulating sounds at a larger level such as syllables (phonological awareness); 2) 13 items that assess perceiving or manipulating sounds (phonemic awareness); 3) 9 items associated with the use of letter-sound

correspondences, generalization, rules, and pattern of written language (decoding); and 4) 8 items on the use of units of meaning to decode or comprehend (morphological). These questions allowed for a comprehensive examination of participating teachers understanding of language and literacy constructs necessary for early literacy instruction (Cantrell et al., 2011).

Demographic questions were added to the survey to gather data from teachers electing to participate in the study (see Procedures section below). Participants were asked to record their gender, the grade level they were currently teaching, years of teaching experience, and whether they have served as a principal in the past or would do so in the upcoming academic year. Educational experience was also requested by asking the type of degree and any certifications and endorsements held. Finally, participants were asked to indicate if they attended the professional development on the five essential elements of effective literacy instruction during the prior year that was described earlier.

Data Entry

In order to more easily manage the data and subsequent analyses, responses from the 65 paper copies were manually entered into an on-line version of the survey that was created using the Qualtrics software. The researcher completed data entry over a 6-day period, with an average of 10 surveys entered per day. To ensure fidelity of the data entry process, a doctoral candidate from the principal investigator's program was added to the research team via an amendment to the IRB protocol. Based on generally accepted standards for secondary scoring analysis (Hoyt, 2010), data entry for 30% of the surveys underwent a secondary review. Since the researcher organized the documents by grade level, surveys from each grade level were selected to ensure a random sampling of 30% ($N = 20$) of the 65 surveys.

The fidelity check consisted of a review of the demographic data and all items in the survey, for a total 63 items on each survey. Of the 1,260 items reviewed as part of the fidelity check, only 3 errors were noted, indicating a high degree of fidelity across the two individuals (99.8%). Specific errors involved discrepancies between responses on the paper version of the survey and what was recorded in Qualtrics. For example, in the demographic section of one survey, the participant was marked as "yes" when asked if ever served as principal in Qualtrics, but the paper copy indicated a "no." The remaining two items occurred on the same item in which both participants marked "consonant digraph" on the paper copy but "consonant blend" was recorded in Qualtrics. After discussion between the researcher and the individual conducting the fidelity checks, all three items were adjusted and recorded in Qualtrics.

Research Questions and Hypotheses

The following five research questions were developed for this study: 1) What knowledge do teachers have of early literacy instruction? 2) What skills do teachers report in relation to early literacy instruction? 3) What are teachers' perceptions of their knowledge and skills? 4) What is the relationship between teachers' knowledge, skills, and perceptions? and 5) What relationships exist between teachers' knowledge, skills, and perceptions and several demographic variables (e.g., grade level taught, educational background, years of experience, participation in previous professional development).

Based on the literature reviewed in Chapter 2 examining the knowledge of early literacy constructs among pre-service, in-service, and university instructors, it was hypothesized that the parochial school teacher participants of the current study would score similarly to those in previous investigations. In other words, it was hypothesized that the results of the survey would identify gaps in the participants' knowledge and skills associated with basic literacy constructs.

While some previous investigations have demonstrated a difference between knowledge and skills, given the principal investigator's previous experiences working with the sample of teachers as part of the university-foundation partnership, no difference between participants' responses to knowledge- and skill-based items was expected. It was also hypothesized that the majority of the participants would rate themselves as very good or expert in all areas. Participants of this study were expected to perceive their knowledge at a higher level than the findings of the survey would indicate. As such, it was expected that a discrepancy between perceptions and knowledge and skills of participants would be demonstrated.

In terms of demographic variables, it was expected that teachers in the preschool through third grade band would score higher on survey items, particularly those related to phonemic awareness and phonics, because these domains are more closely related to instruction provided to younger students. Therefore, it was hypothesized that grade level would have an influence on the overall findings of the study. Based on the literature reviewed in Chapter 2, it was hypothesized that educational background and years of experience of participants would not influence participants' knowledge and skills. Finally, given the focus of the professional development sessions offered in the previous year, an impact on the knowledge and skills of those participants who attended was expected.

Data Analysis

To address the research questions developed for this study, the following analyses were conducted. Descriptive statistics were calculated to address the first three research questions. Specifically, the average percentage correct was calculated to explore group findings in relation to the 12 knowledge- and 26 skills-based questions. Examining the average percentage correct within each of the four early reading domains of the survey (i.e., phonological awareness,

phonemic awareness, decoding, and morphological) offered further insights into participants'

knowledge and skills in the language and literacy construct necessary for early literacy

instruction. The results of these analyses were used to address research questions one and two.

In regards to research question three, mean scores and standard deviations for each of the

eight questions were computed across participants to examine perceptions of knowledge in each

area of reading instruction assessed. To further explore these findings, the percentage of

participants rating their knowledge within each of the four categories (i.e., minimal, moderate,

very good, and expert) was calculated for the eight items. In order to conduct analyses to address

questions four and five, five scales were used. These scales were developed based on the

findings of the National Reading Panel (NRP) and the theoretical underpinnings of early literacy

development (e.g., Chall, 1983).

Scales

Two of the five scales focused on the domain of phonemic awareness skills. Phonemic

awareness is one of the five areas identified by the NPR as essential for early literacy instruction.

The first scale, Phonemic Awareness Segmentation, included seven items that assessed

participants' ability to segment words by individual speech sounds. A second scale, Phonemic

Awareness Reversal, included items related to the skill of reversing sounds within word (e.g., *If*

you say the word, and then reverse the order of the sounds, ice would be _____).

In addition to phonemic awareness, the NRP also identified phonics as a second area

deemed essential for effective literacy instruction. For purposes of the analysis in this study, two

scales were constructed for this domain. The first, Phonics Knowledge Rules, consisted of two

items asking participants to identify rules governing the use of letters in the initial position of

word. A second scale, Phonics Knowledge Basic Syllables, contained items that required

participants to identify words based on syllables types. A fifth scale was constructed with items related to participants' knowledge and skills in the area of morphology (i.e., Basic Morphology). This scale included the knowledge-based item related to the definition of a morpheme and two skill-based questions requiring participants to identify the number of morphemes in words.

As a measure of internal consistency reliability, Cronbach's alpha (α) was computed for each of the scales. Following general guidelines, measures with reliability values of approximately .70 or better are considered acceptable (see Nunnally, 1978 for discussion). All scales used in this investigation met this criterion, with values ranging from .66 to .85. See Table 1 regarding the items included in each scale and the resulting alpha coefficients values.

Table 1

Scale Items and Cronbach's Alpha Coefficients

Variable	Items	Cronbach's α

Phonemic Awareness Skill (Segmentation)	Number of speech sounds in:
	  Ship
	  Moon
	  Knee
	  Through
	  Box
	  Grass
	  Brush
		.71

Phonemic Awareness Skill (Phoneme Reversal)	If you say the word, and then reverse the order of the sounds, *ice* would be: If you say the word, and then reverse the order of the sounds, *enough* would be:	.77

Phonics Knowledge (Rules)	What is the rule that governs the use of 'c' in the initial position for /k/?	.85
	What is the rule that governs the use of 'k' in the initial position for /k/?	
Phonics Knowledge (Basic Syllables)	Which of the following words has 2 closed syllables?	.66
	Which of the following words contains an open syllable?	

Morphology Knowledge and Skills (Basic Morphology)	Number of morphemes in:
	  Heaven
	  Frogs
		.66

	A morpheme refers to:	

Regression Analysis

To address research question five, a linear regression analysis was conducted to examine the relationship between the scales and several demographic variables (i.e., years of teaching experience, participation in previous professional development, grade level taught, and educational background). Within the survey, grade level was categorized in three bands: 1) preschool through third grade, 2) fourth through eighth grade, and 3) multi-grade. Because the category of multi-grade is not mutually exclusive (i.e., it could include teachers working with students in both of the other grade bands), only the preschool through third grade and fourth through eighth grade categories were used in the regression analysis. This decision was also justified by the relatively small percentage of participants identified in the multi-grade category (18.5%) and the fact that it was hypothesized that the items on the survey were more closely associated with literacy instruction provided to younger students. Educational background was coded according to degree type: 1) associates, 2) bachelors, 3) masters, and 4) doctorate. Years of teaching experience was organized into five categories: 1) first year teacher, 2) 1-3 years, 3) 4-

9 years, 4) 10-19 years, and 5) 20 or more years. Finally, participants were grouped into two categories to indicate whether or not they attended the previous professional development training (i.e., attended or did not attend). Version 25 of SPSS (IBM Corp., 2017) was used to conduct all analyses.

CHAPTER 4

RESULTS

Descriptive statistics are reported to address research questions one and two (i.e., average percentage correct) as well as research question three (i.e., mean scores, standard deviations, percentages). Findings of the Pearson correlation analysis are described to address research question four. Finally, results of the linear regression analysis are presented in order to address research question five.

Participant Demographics

Of the 65 participants, 84% were female and 16% male. Participants had the option of reporting their age using six different bands, including 21-years-old and under (0%), 22- to 34-years-old (29%), 35- to 44-years-old (17%), 45- to 54-years-old (18%), 55- to 64-years-old (28%), or 65 years of age and older (8%). The overwhelming majority of the participants were White (89%), followed by Black or African American (9%), and American Indian or Alaska Native (2%). About half of the participants reported a bachelor's (51%) as their highest degree, whereas 42% reported having a master's degree. Only a very small percentage held either an associate (6%) or doctoral degree (1%). State guidelines do not require parochial school teachers to hold a teaching license; however, 81% of participants reported having one. Information regarding the current teaching placements of the participating teachers was requested and organized into three clusters. Early literacy teachers, or those teaching in grades preschool through grade 3, represented 48% of the teachers taking the survey. The remaining two clusters, those teaching in grades 4 to 8 represented 34%, and multi-grade, or those teaching in various grade combinations, represented 18% of the study participants.

Nearly half of the teachers surveyed have over 20 years of teaching experience. Reported ranges of teaching experience included first year teachers (2%), 1 to 3 years (10%), 4 to 9 years (21%), 10 to 19 years (27%), and 20 years or more (40%). Half of the study participants reported having teaching experience outside of the parochial system and nearly 40% of the participants attended the yearlong professional development aimed at building teachers' foundational knowledge in teaching reading offered through the university-foundation partnership. Table 1 displays demographic data for study participants.

Table 2

Demographics of Participants

Characteristic	Percent
Gender	
Female	84
Male	16
Age	
21 years old and under	0
22-34 years old	29
35-44 years old	17
45-54 years old	18
55-64 years old	28
65 years and older	8
Race	
American Indian or Alaska Native	2
Asian	0
Black or African American	9
Native Hawaiian or Other Pacific Islander	0
White	89
Total years of teaching experience	
First year teacher	2
1–3 years	10
4-9 years	21
10-19 years	27
20 years or more	40

Grade level currently teaching
     Preschool-3rd grade   48

Grade level currently teaching	
Preschool-3rd grade	48
4th-8th grade	34
Multi-grade	18
Highest Degree Earned	
High School or GED	0
Associate	6
Bachelor's	51
Master's	42
Doctorate	1
Licensed teacher	
Yes	81
No	19
Professional development series participant	
Yes	37
No	63
Teaching experience outside parochial system	
Yes	51
No	49

Knowledge and Skills of Participants

To address research questions one and two regarding the knowledge and skills teacher possess in the area of early literacy instruction, the 18 items of the BLCS were used. These items assess teachers' knowledge and skills in language and literacy constructs necessary for early literacy instruction. It is important to note that items 12 and 19 were both multi-task items. Thus, participants were asked a total of 38 questions. For example, item 12 required participants to count the number of speech sounds in seven different words, with each word counting as one item. For item 19, participants had to determine the number of syllables and morphemes within seven words. Each task (i.e., determining the number of syllables and the number of morphemes) was counted as one item each per word. Therefore, item 19 included 14 separate tasks. With the

exception of these two items, all remaining items were multiple-choice questions. Participants were provided with four possible answers and the option to select "no idea".

Results of the overall survey indicated a mean percentage of 54%. Of the total number of questions on the survey, 12 items qualify as knowledge-based tasks. Asking participants to correctly identify the definition of phonemic awareness or the rule that governs the use of "k" in the initial position for /k/ are both examples of knowledge-based item teachers were asked to complete in the survey. Teachers scored on average 45% correct on the knowledge-based items. The remaining 26 items on the survey were characterized as skilled-based. Tasks such as identifying the correct number of syllables in a word or a pair of words that begin with the same sound are both examples of skilled-based items. Results of these items indicated a much higher average score of 77%. Table 2 displays survey results according to item type.

Table 3

Average Percentage Correct for Knowledge- and Skill-Based Items

Category	Percent
Knowledge question total	45
Skill question total	77

Domains. Individual survey items were further clustered into four domains including phonological awareness, phonemic awareness, phonics, and morphology. In the area of phonological awareness, participants were asked eight questions that involved perceiving or manipulating sounds at a linguistic level such as syllables. Results found that participants scored the highest in this area, earning a mean percentage correct of 86%. A total of 13 items assessed phonemic awareness, or the ability to perceive or manipulate individual sounds in spoken

language without the aid of print. Participants' earned a mean percentage of 54% correct in this area. In the area of phonics, nine survey items were associated with the use of letter-sound correspondences as well as generalization, rules, and patterns of written language. Participants scored on average 46% correct in this cluster of items. Lastly, eight items on the use of units of meaning to decode or comprehend were included in this survey to assess participants' knowledge in the area of morphology. Results indicated this area as one of the lowest among all areas, with participants scoring only 20% correct on these items. The mean percentage of correct responses of survey items by various domains is presented in Table 3.

Table 4

Average Percentage Correct by Domain associated with Early Literacy Instruction

Domain	Percent
Phonological Awareness	86
Phonemic Awareness	54
Phonics	46
Morphology	20

Table 4 presents a comparison between items from the domain in which participants earned the highest score (i.e., phonological awareness) and the one in which the participants earned the lowest score (i.e., morphology) is provided. This comparison was also made in a previous investigation using the BLCS (Joshi et al., 2009). ninety five percent of the teachers could correctly identify the number of syllables in the word pedestal, but only 8% could identify the number of morphemes in that word.

Table 5

Mean Percentages of Participants Correctly Identifying the Number of Syllables and Morphemes in Given Words

Word	Percentage correct of Syllables	Percentage correct of Morphemes
Disassemble	95	22
Heaven	98	28
Observer	100	60
Spinster	90	47
Pedestal	95	8
Frogs	95	42
Teacher	98	57

Self-Perceptions of Participants

The first eight items of the BLCS required participants to evaluate their knowledge in eight areas related to reading instruction. These items were used to address research question three associated with teachers' perceptions of their knowledge and skills. Included in this section are the five areas essential for effective reading instruction as recommended by National Reading Panel [NRP] (2000) (i.e., phonemic awareness, phonics, fluency, vocabulary, and comprehension) as well as children's literature, teaching literacy to ELL's, and using assessment to inform reading instruction. Participants assessed their knowledge using a Likert scale (1 minimal, 2 = moderate, 3 = very good, and 4 = expert).

In the five areas deemed critical for effective literacy instruction, participants on average rated their knowledge between moderate and very good. Specifically, mean scores indicated that

participants rated their knowledge of phonemic awareness 2.54 (SD = .77), phonics 2.71 (SD = .72), fluency 2.72 (SD = .72), vocabulary 2.77 (SD = .72), comprehension 2.86 (SD = .75). Mean scores for the remaining categories include children's literature 2.65 (SD = .80), teaching literacy to English language learners 1.84 (SD = .88), and using assessment to inform reading instruction 2.43 (SD = .77). Table 5 presents the mean scores and standard deviations of survey items assessing self-perceptions of the participants.

Table 6

Mean Scores of Participants' Self-perceptions of Knowledge and Skills

Survey Item	Mean Score (*SD*)
Phonemic awareness	2.54 (.77)
Phonics	2.71 (.72)
Fluency	2.72 (.72)
Vocabulary	2.77 (.72)
Comprehension	2.86 (.75)
Children's Literature	2.65 (.80)
Teaching literacy to English language learners	1.84 (.88)
Using assessment to inform reading instruction	2.43 (.77)

Table 6 displays percentages of participant perceived knowledge and (i.e., minimal, moderate, very good, and expert). When looking at those who evaluated their knowledge as minimal, the highest number of participants perceived their knowledge in the domains of phonemic awareness (9%) and phonics (6%) as the weakest. In other words, of the five areas

deemed critical for effective literacy instruction, participants were least confident in their

knowledge of phonemic awareness followed by phonics. In contrast, the area in which

participants felt most confident was in the domain of comprehension. In fact, 17% of the

participants considered their knowledge in comprehension in the expert range and 56% as very

good. It is interesting to note that of the three additional items related to assessment and working

with special populations, almost half (42%) of the participants ranked their knowledge as

minimal in teaching literacy to English language learners.

Table 7

Percentages by Rating of Participants' Perceptions of Knowledge and Skills

	Minimal	Moderate	Very Good	Expert
Phonemic Awareness	9	35	48	8
Phonics	6	26	59	9
Fluency	5	29	55	11
Vocabulary	3	31	52	14
Comprehension	5	22	56	17
Children's Literature	9	28	52	11
Teaching literacy to English language learners	42	36	17	5
Using assessment to inform reading instruction	8	51	32	9

Relationship Between Knowledge, Skills, and Perceptions

Further analyses were conducted to explore the relationship between knowledge, skills and perceptions. A Pearson correlation analysis was used to examine the relationship between participants' perceptions of their knowledge and skills, and scales and items from the BLCS. The following relationships were explored: 1) participants' rating of knowledge of phonemic awareness, the two phonemic awareness scales, and two phonemic awareness items from the survey; 2) participants' rating of knowledge of phonics and the two phonics scales; and 3) participants' rating of knowledge of vocabulary and the morphology scale.

Findings revealed a statistically significant relationship between teacher's perceptions of their knowledge in the area of phonemic awareness and their knowledge as measured by the BLCS ($r = .374$, $p<.001$). For example, teachers who knew the correct definition of a phoneme were also confident in their knowledge of phonemic awareness. Another analysis yielded a significant relationship between the two phonemic awareness scales ($r = .423$, $p<.001$). In other words, if a respondent scored high on the items pertaining to phoneme segmentation, they were also successful at completing items associated with phoneme reversal. Findings also revealed a statistically significant relationship between teacher's perceptions of their knowledge of phonics and a phonics scale ($r = .268$, $p<.05$). In this case, teachers who were successful on survey items related to basic syllables were also confident in their knowledge of phonics. Finally, a vocabulary scale yielded another significant relationship ($r = .254$, $p<.05$). In other words, participants who rated their knowledge in vocabulary as higher did well on the basic morphology survey items. Detailed results of these analyses are reported in Tables 7, 8, and 9.

Table 8

Correlations Between Participants' Perception of Phonemic Awareness Knowledge and Phonemic Awareness Scales and Survey Items

Scale/Item	1	2	3	4	5
1. Perception of phonemic awareness knowledge	1.00	---	---	---	---
2. Phonemic awareness segmentation	.137	1.00	---	---	---
3. Phonemic awareness reversal	.170	.423**	1.00	---	---
4. A phoneme refers to	.374**	.189	.198	1.00	---
5. Phonemic awareness is	-.029	.009	.025	.199	1.00

**Correlation is significant at the 0.01 level

Table 9

Correlations Between Participants' Perception of Phonics Knowledge and Phonics Scales

Scale	1	2	3
1. Perception of phonics knowledge	1.00	---	---
2. Phonics rules	.099	1.00	---
3. Phonics basic syllables	.268*	.225	1.00

*Correlation is significant at the 0.05 level

Table 10

Correlations Between Participants' Perceptions of Vocabulary Knowledge and Morphology Scale

Scale	1	2
1. Knowledge of vocabulary	1.00	---
2. Basic morphology	.254*	1.00

*Correlation is significant at the 0.05 level

Relationship Between Knowledge, Skills, and Perceptions and Demographic Variables

To explore the relationship between knowledge, skills, perceptions, and demographic variables, a regression analysis was conducted. Participants' perceptions of their knowledge and skills in three areas (i.e., phonemic awareness, phonics, and vocabulary), the scales created from the BLCS (i.e., two phonemic awareness, two phonics, and one morphology), and four demographic variables (i.e., years of teaching experience, participation in previous professional development, grade level taught, and educational background) were employed in this analysis.

In terms of perceived knowledge in the area of phonemic awareness, the $R^2=.28$ and the only variable that reached the level of significance (p<.05) was current grade level taught (*b=.467;* β=*.304)*. In other words, participants teaching in grades four through eight reported being more confident in their knowledge of phonemic awareness. When considering perceived knowledge in the area of vocabulary, the $R^2=.245$ and two variables that reached the level of significance. Years of teaching experience (*b=.300;* β=*.431; p <.01)*. In other words, the more years of experience the teacher had, the more confident the teacher reported his/her knowledge of vocabulary. Knowledge and skill in basic morphology was also found to be statistically significant (*b=.781;* β=*.334)*, p<.05). The higher the knowledge and skills of the participant in

basic morphology, the higher the participant perceived his/her knowledge of vocabulary. No

statistically significant relationships were identified in the area of phonics. Tables 10 and 11

include the unstandardized coefficients (B), standard errors (SE), standardized coefficients (β),

for all variables used in these analyses.

Table 11

Regression Analysis for Phonemic Awareness

Variable	B	SE B	β	Sig
Years of teaching experience	-.012	.103	-.016	.908
Participation in previous professional development	.081	.209	.052	.700
Grade level taught	.467	.209	.304	.031*
Educational background	-.322	.177	-.248	.076
Phonemic awareness reversal	.502	.284	.286	.085
Phonemic awareness segmentation	.333	.490	.108	.500

*p<.05

Table 12

Regression Analysis for Vocabulary

Variable	B	SE B	β	Sig
Years of teaching experience	.300	.098	.431	.004**
Participation in previous professional development	-.319	.198	-.219	.114
Grade level taught	.032	.200	.022	.875
Educational background	-.086	.166	-.071	.607
Basic Morphology	.781	.324	.334	.020*

*p<.05; p<.01

Open-ended Responses

An optional open-ended question was added to the survey as item 19. Participants were invited to share any additional information about their knowledge or perceptions related to the foundations of literacy, literacy instruction, and/or assessment. Only seven teachers choose to record information in this section. One participant commented, "This is complex and very targeted. I find it fascinating." Another teacher indicated, "I'm familiar with the International Phonetic Alphabet, but I haven't taught it. I intend to teach it to my school choir students." A third participated explained, "K-3rd can be adequately educated under the same principals of scaffolding and intervention techniques research is providing for ELL's. Thank you for this!" The remaining four participants recorded brief conversational type of comments that did not directly relate to the question prompt (i.e., None, Thanks, N/A, Have worked w/ELL students for 20+yrs., and Where are the math problems?). Only the first comment was considered relevant to

literacy knowledge and skills; therefore, it will be explored further as part of the discussion

presented in Chapter 5.

CHAPTER 5

DISCUSSION

For the past 20 years, studies have highlighted gaps in the disciplinary knowledge

necessary for early literacy instruction among teachers. Simultaneously, the United States made a

commitment to reading proficiency through various initiatives (e.g., No Child Left Behind) with

the goal of all children learning to read by grade 3. It is imperative that teachers tasked with

teaching children to read have a deep understanding of a theoretical framework supporting this

process, content knowledge, and instructional strategies that sustain this development in young

children. Theoretical frameworks such as Chall's Stages of Reading Development (1983)

provide a structure for these teachers, and the context for understanding how readers move

through various stages as they learn to read and begin to use reading as a tool for learning.

The National Reading Panel (2000) specifically addressed the content knowledge and

instructional strategies found most effective in teaching children how to read. The findings of the

panel clearly demonstrate that phonemic awareness and phonics significantly improve children's

word reading, comprehension, and spelling. These findings support the importance of instruction

in phonemic awareness and phonics as part of early literacy instruction. The NRP also identified

reading fluency, vocabulary, and comprehension as essential elements of instruction, although

they tend to become the focus once children become independent readers.

Despite this, studies over the past two decades continue to reveal that teachers'

knowledge and skills associated with the language structures necessary for effective literacy

instruction are lacking. Furthermore, some studies draw attention to the role perceptions play in

this matter, specifically, discrepancies between actual and perceived knowledge of practicing

teachers. Additionally, studies have shown the impact a lack of knowledge can have on student

success. A promising revelation in the research indicates that while teachers may be lacking required disciplinary knowledge and skills, attempts to increase these abilities among practicing teachers have been successful.

Digging deeper into this issue facing teachers today requires a closer look at the means in which researchers measure this knowledge. A large majority of previous studies have used Moat's tool, the *Informal Survey of Linguistic Knowledge,* or variations of it (Moats, 1994; Barnsley & Purdie, 2005; Crim et al., 2008, Cunningham et al., 2004). The *Basic Language Constructs Survey* (BLCS) is an assessment that was specifically created to investigate teachers' knowledge, skills, and perceptions of their knowledge of basic language constructs. Unlike tools used in previous studies, the creators of the BLCS evaluated the tool to establish various psychometric properties, and results indicated evidence of adequate validity and reliability (Binks-Cantrell, Joshi, & Washburn, 2012). However, prior investigations using the BLCS were conducted with pre-service teachers and teacher educators; therefore, the authors indicated a need for this tool to be used in studies involving in-service teachers. This study directly addressed this recommendation by administering the survey to a group ($N = 65$) of practicing parochial school teachers. The hypotheses associated with the five research questions developed for this investigation that were outlined in Chapter 3 will be used to guide the discussion of findings.

Participant Demographics

This study sought to explore the knowledge of basic language constructs related to early literacy instruction among practicing teachers. The majority of the 65 teachers participating in this study were female (84%), with males representing only a small portion of study participants. In keeping with the large margins, nearly 90% of the participants were white. In general, study

participants were experienced teachers, with about 10% reported has having three or less years of experience. Given that those teaching in the parochial school system are not bound to state licensure requirements, it was encouraging that 80% of the sample held a teaching license. While also not required to complete continuing education requirements, nearly 40% of participating teacher have earned an advanced degree. In other words, this sample represents an experienced and educated group of practicing teachers.

Knowledge and Skills of Participants

Results of previous studies among pre- and in-service teachers and university instructors suggest gaps in teachers' knowledge of and skills related to early literacy constructs (Moats, 1994; Barnsely & Purdie, 2005; Crim et al., 2008; Cheesman et al., 2009; Swerling & Chessman, 2011; Cunningham et al., 2004; Mather et al., 2001). Based on these findings, it was hypothesized that participants of the present study would score similarly to those in previous investigations. Items from the BLCS were used to investigate the knowledge and skills necessary for early literacy instruction of all participants in this study. While a difference between participants' scores on the knowledge- and skill-based items was not anticipated, a difference between the two item types was in fact demonstrated. Consistent with the findings of previous studies (Chessman et al., 2009, McGuire et al., 2009; Martinussen et al., 2015; Joshi et al., 2009, Binks-Cantrell et al., 2012, Washburn et al., 2016), participants of the current study performed better on skill-based items (77%) as compared to knowledge-based items (45%).

Comparisons with Previous Studies of the BLCS. A direct comparison of the findings obtained in the present investigation with previous studies using the BLCS (Binks-Cantrell et al., 2012, Washburn et al., 2016) was conducted and revealed interesting findings. Prior to the current investigation, the BLCS has been used in studies of pre-service teachers (i.e., teacher

candidates) and college instructors (i.e., teacher educators) of reading education courses. Variations within those samples include teacher educators who received three years of professional development on research-based reading instruction (PD-TE), teacher educators who did not participate in professional development (NPD-TE), and teacher candidates in classes of each (PD-TC) and (NPD-TC). When examining the average percentage obtained on the skill-based items for the participants of the present study (77%), findings indicated that these in-service teachers scored similar to teacher educators who received professional development (78%) and higher than those teacher educators who did not (60%). In discussing this finding, Washburn et al., (2011b) suggested that teacher knowledge of concepts and skills deepen with classroom experience. As previously noted, the current sample is a very experienced group (i.e., 89% having more than four years of experience) and may explain why skills items were a relative strength among the in-service teachers in this study.

When comparing overall scores on knowledge items with other populations using the BLCS, the in-service teachers in this study scored lower (45%) than nearly all groups (NPD-TE=56%, PD-TE=75%, PD-TC=61% in the Binks-Cantrell et al., study and pre-service teachers=48% in the Washburn et al., 2016 study), except for one group of teacher candidates (NPD-TC=37%). Of all populations assessed used the BLCS, the discrepancy between the knowledge- and skill-based items was the largest among the in-service teachers in this study, a 32% difference as compared to differences ranging from 3 to 18%. While it is encouraging that the participants of the present study are a skilled group of teachers, Washburn et al., (2011b) highlighted the importance of teachers possessing the necessary content knowledge associated with early literacy instruction suggesting that those without ample understanding are unable to carry out effective classroom practices (e.g., interpreting reading assessments, using assessment

results to inform instruction for readers experiencing difficulties). Further, levels of teacher knowledge have been found to influence the effectiveness of instructional practices in early literacy classroom (Piasta et al., 2009).

As previously noted, questions included in the BLCS were furthered classified by four early literacy domains (i.e., phonological awareness, phonemic awareness, phonics, morphological). In general, participants of the present study performed better on phonological awareness items (86%) and were the weakest in items related to morphology (20%). Findings in two remaining domains, phonemic awareness (54%) and phonics (46%), revealed that, on average, participants were only able to answer approximately half of the questions correctly. When comparing in-service teachers' performance in the four domains with other populations (i.e., pre-service teachers and college instructors) using the BLCS, a few insights are important to note. For example, the average percentage correct in the area of phonological awareness of in-service teachers was similar to other populations, thus suggesting a relative strength across all groups. However, scores in the phonemic awareness (54%) and phonics (46%) domains for participants of the current study were among the lowest and similar to pre-service teachers across the various studies. Unfortunately, in-service teachers in this study also scored the lowest of all groups on morphological items.

To expand further on participants' knowledge, it is important to note that some items in the BLCS offered participants the option to choose *no idea* as an answer. When asked to define phonemic awareness, 6% of participants selected *no idea* but when asked to define a morpheme, 32% selected this option. It is important to note that the in-service teachers in this study completed a paper version of this survey with the principal investigator monitoring participants who may have had questions. Other studies using the BLCS were online versions that were

distributed via email to be completed on participants' own time. It is possible that the differences in response modes across studies may have impacted findings. Table 1 displays a comparison of results across the studies using the BLCS.

Table 13

Average Percentage Correct in Studies Using the BLCS

	Study1 (2012) (*N*=287)					Study 2 (2016) (*N*=279)	Current Study (2017) (*N*=65)
	OV (*n*=287)	NPD TE (*n*=66)	PD TE (*n*=48)	NPD TC (*n*=118)	PD TC (*n*=55)		
Knowledge-based items	53	56	75	37	61	48	45
Skill-based items	62	60	78	55	68	59	77
Phonological items	87	87	94	86	85	63	86
Phonemic awareness items	64	62	79	53	77	52	54
Phonics items	50	56	72	35	58	58	46
Morphological items	33	27	64	22	38	37	20

Note: Study 1=Binks-Cantrell et al. (2009) college instructors and pre-service teachers, OV=Overall, NPD-TE=No Professional Development-Teacher Educators, PD-TE=Professional Development-Teacher Educators, NPD-TC= No Professional Development-Teacher Candidates, PD-TC=Professional Development-Teacher Candidates, Study 2=Washburn et al. (2016) pre-service teachers, Lazich (current) in-service teachers

Domain Specific Knowledge and Skills

Because several items within each of the four domains of the BLCS were identical to those reported in previous investigations, it is possible to make comparisons across several studies. Further information regarding these comparisons is provided in the following sections.

Phonological Awareness. In the strongest domain measured, only 42% of the participants of the present study could identify the correct definition of phonological awareness, a knowledge-based item. It is interesting to note that 48% of participants incorrectly selected the definition of phonics for this item. In other words, nearly half of the respondents believed phonological awareness was the ability to use letter-sounds correspondences to decode. This inability to define phonological awareness was also reported in earlier studies (Washburn et al., 2011a; Washburn et al., 2011b).

Participants did exceptionally well on the skill-based items asking them to count syllables within various words. In fact, this domain had the only question within the survey in which 100% of participants answered correctly (i.e., *determine the number of syllables in the word observer*). Counting syllables appeared to be a relative strength in previous studies as well (Moats, 1994; Barnsley & Purdie, 2005; Crim et al., 2008, Joshi et al., 2009, Washburn et al., 2011a;). When compared to other populations of participants (i.e., college educators and pre-service teachers), the in-service teachers in this study obtained the highest scores on these items.

While counting syllables is common practice in early literacy classrooms, it is not the only skill related to phonological awareness. Word discrimination, rhyme recognition, rhyme production, syllable blending, syllable segmenting, syllable deletion, and working with compound words are all skills related to phonological awareness (Bursuck & Damer, 2014). In reviewing these items and the scores obtained by participants across studies, it is important to

consider that the measure may be limited in this domain and not sensitive enough to capture differences or adequately assess teacher knowledge across a range of skill. In other words, relying solely on syllable counting could be a narrow measure of participants' skills in phonological awareness and may have an impact on the findings obtained. Table 2 shares finding of items in the phonological awareness domain across studies.

Table 14

Phonological Awareness Items Across Studies

	S1 (2009) *N*=78	S2 (2011a) *N*=91	S3 (2011b) *N*=185	S4 (current) *N*=65
Phonological awareness is:	---	58%	45%	42%
Number of syllables in: *heaven*	92%	93%	---	98%
Number of syllables in: *observer*	96%	97%	---	100%
Number of syllables in: *teacher*	92%	97%	---	98%
Number of syllables in: *frogs*	88%	77%	---	95%
Number of syllables in: *spinster*	90%	---	---	90%

Note: S=Study, S1=Joshi et al. (2009) college instructors, S2=Washburn et al. (2011a) pre-service teachers, S3=Washburn et al. (2011b) in-service teachers, S4=(Current) in-service teachers

Phonemic Awareness. The average percentage correct in the domain of phonemic awareness for participants of the current investigation (54%) are also similar to findings of previous studies with practicing teachers (Brady et al., 2009; Martinussen et al., 2015; McGuire et al., 2009; Spear et al., 2011). Consistent with findings of earlier studies (Mather et al., 2001; Joshi et al., 2009; Washburn et al., 2011a; Washburn et al., 2011b), approximately 90% of teachers in the present study correctly defined a phoneme as a single speech sound (a

knowledge-based item). Unfortunately, only 25% could identify the correct definition of phonemic awareness (e.g., *the ability to break down and manipulate the individual sounds in spoken language*), while nearly 60% believed it was the understanding of how letters and sounds are put together to form words. This large discrepancy between the two items (e.g., *A phoneme is*: and *phonemic awareness is*:) has also been documented across several studies (Joshi et al., 2009, Washburn et al., 2011a; Washburn et al., 2011b). The results of the NRP and earlier studies of teacher knowledge, coupled with the findings of the present study, highlight this common confusion among practicing teachers. While phonemic awareness is strictly an auditory skill with no connection to print, many study participants believed this domain to have an association with letters, sounds, and the forming of words, as evidenced in this study with 60% selecting an incorrect definition of phonemic awareness.

For skill-based items in this domain, participants were asked to count the number of phonemes in words. Scores among these items ranged from 5% to 83% correct. In keeping with the findings of earlier studies, teachers had difficulty identifying the number of phonemes in the word *box* (Mather et al., 2001; Cunningham et al., 2004; Washburn et al., 2011b). Nearly 80% of respondents believed the word *box* had three speech sounds, although the word actually has four. This confusion may have been caused by the letter *x*, in that it makes two separate speech sounds /k/ and /s/. Similar errors may also account for confusion with other items. For example, when asked to count the number of speech sounds in the word *grass,* only 41% of participants could correctly identified four speech sounds in the word. This word also proved to be difficult for teachers in earlier studies (Mather et al., 2001; Cunningham et al., 2004).

The confusion between a blend and diagraph may explain why 54% of participants incorrectly selected three as the number of phonemes in the word *grass.* While a diagraph is

single sound formed by two letters (e.g., */ch/*, */sh/, /th/)*, two or three letters blended together but maintaining their original sounds is a blend (e.g., */s/ /t/* or */b/ /l/*). Respondents may have confused the blend -*gr* as a diagraph, counting it as one sound rather than two separate sounds. This confusion may have also presented itself in the word *brush*. More than half (64%) of respondents selected three as the correct number of speech sounds in the word. The word segmented by sound is /b/ /r/ /u/ /sh/, totaling four phonemes. It is very likely that participants confused -*br* for a diagraph, accounting for a single speech sound rather than the two is represents.

Participants did well on the phoneme identification task, an instructional strategy suggested by the NRP. When asked to identify words that begin with the same sound (e.g., *Identify the pair of words that begin with the same sound*:), nearly 90% of participants correctly identified *chef* and *shoe.* Participants in previous studies also experienced similar success with this item (Joshi et al., 2009, Washburn et al., 2011a; Martinussen et al., 2015). Approximately 70% of teachers in the present study also successfully completed a phoneme reversal item associated with the word *ice* (e.g., *If you say the word, and then reverse the order of the sounds, ice would be_____)* and when asked to perform the same task using the word *enough*, 63% were successful. Researchers in an earlier study assessing the knowledge of early literacy instruction among 424 pre- and in-service teachers reported similar success rates on these phoneme reversal items (59% and 69%, respectively) (Mather et al., 2001). A study using the BLCS with 91 pre-service teachers also revealed similar findings in relation to these phoneme reversal items (i.e., 64% and 63%, respectively) (Washburn et al., 2011a). Table 3 displays the results of phonemic awareness items across studies.

Table 15

Phonemic Awareness Items Across Studies

	S1 (2001) N=424	S2 (2004) N=722	S3 (2009) N=223	S4 (2009) N=78	S5 (2011a) N=91	S6 (2011b) N=185	S7 (2015) N=54	S8 (current) N=65
Phonemic awareness is:	---	---	41%	54%	59%	29%	52%	25%
A phoneme is:	81%	---	---	98%	92%	82%	61%	89%
Number of speech sounds in: *box*	11%	24%	---	42%	47%	24%	---	4%
Number of speech sounds in: *grass*	43%	29%	---	---	70%	---	---	41%
Number of speech sounds in: *moon*	---	---	---	---	87%	90%	---	80%
Number of speech sounds in: *ship*	---	---	---	---	87%	93%	---	83%
Identify words that begin with the same sound: *chef* and *shoe*	---	---	---	92%	87%	---	83%	89%
If you say the words and hen reverse the order of sounds, *ice* would be:	59%	---	---	---	64%	---	---	71%
If you say the words, and then reverse the order of the sounds, *enough* would be:	69%	---	---	---	63%	---	---	63%

Note: S=Study, S1=Mather et al. (2001) pre- and in-service teachers, S2=Cunningham et al. (2004) in-service teachers, S3=Cheesman et al. (2009) in-service teachers, S4=Joshi et al. (2009) college instructors, S5=Washburn et al. (2011a) pre-service teachers, S6=Washburn et al. (2011b) in-service teachers, S7=Marinussen et al. (2015) pre-service teachers, S8=Lazich (current) in-service teachers

Phonics. Results in the domain of phonics (46%) were also consistent with previously

published studies involving in-service teachers (Brady et al., 2009; Spear-Swerling & Chessman,

2011). Specifically, on an item asking to identify a word with a "soft c", participants did well, with 84% of the sample answering correctly. This result is similar to earlier studies that used this item (76%, 82%) (Washburn et al., 2011a; Washburn et al., 2011b). In fact, as displayed in Table 4, teachers in the current sample scored the highest on this item when compared to participants in other studies. Another item evaluating knowledge of vowel sounds (e.g., *If tife is a word, the letter "i" would probably sound like the "i" in*) found an 80% success rate among participants. This result is also consistent with findings of an early investigation (94%) (Mather et al., 2001).

However, items asking participants to identify syllables types were more of a challenge. When considering advanced decoding skills, an understanding of syllable types is particularly important when decoding multisyllabic words (Bursuck & Damer, 2014). Only 10% of teachers in the present study could correctly identified a word with a final stable syllable, and nearly half selected "no idea" as an answer. When exploring syllable types further, similar discrepancies between the open and closed syllables items (23% and 56%, respectively) were also reported in earlier studies (Cunningham et al., 2004, Washburn et al., 2011a; Washburn et al., 2011b). In fact, in one study of 722 practicing teachers (Cunningham et al., 2004), results of both items were nearly identical to the participants of the current investigation. When asked to identify a word with two closed syllables, 56% of participants in both studies were able to answer the item correctly. When asked to identify a word with an open syllable, only 24% of participants answered correctly, nearly the same as the earlier study (i.e., 29%).

A closed syllable, a type that has one short vowel and ends with a consonant, is essentially the same as a word with a consonant-vowel-consonant pattern (C-V-C). Words with a C-V-C pattern are the ones introduced first in beginning reading instruction and form the foundation for the initial teaching of multisyllabic words. On the other hand, an open syllable, a

long vowel sound occurring at the end of the syllable, is a more complex task and may account for the difference in rates of success between these items.

On a specific knowledge-based item in this domain requiring participants to identify the definition of a blend (e.g., *A combination of two or three consonants pronounced so that each letter keeps its own identity is called*), 49% of participants were able to correctly answer this item. Interestingly, 33% believed the definition was that of a diagraph. This finding further supports the earlier statement suggesting the confusion between diagraphs and blends among respondents as it relates to counting speech sounds in the phonemic awareness domain. Table 4 displays phonics items across studies.

Table 16

Phonics Items Across Studies

	S1 (2001) *N*=424	S2 (2004) *N*=722	S3 (2009) *N*=223	S4 (2011a) *N*=91	S5 (2011b) *N*=185	S6 (current) *N*=65
A "soft c" is in the word:	---	---	---	76%	82%	84%
What is the rule that governs the use of 'c' in the initial position for /k/?	---	---	21%	---	53%	50%
If *tife* were a word, the letter *i* would probably sound like *i* in:	94%	---	---	---	---	80%
Identify a word with an: *open syllable*	---	29%	---	27%	26%	23%

| Identify a word with a: *closed syllable* | --- | 56% | --- | 86% | 45% | 56% |
| Identify a word with a: final stable syllable | --- | --- | 50% | 18% | 45% | 10% |

Note: S=Study, S1=Mather et al. (2001) pre- and in-service teachers, S2=Cunningham et al. (2004) in-service teachers, S3=Cheesman et al. (2009) in-service teachers, S4=Washburn et al. (2011a) pre-service teachers, S5=Washburn et al. (2011b) in-service teachers, S6=Lazich (current) in-service teachers

Morphological. Items related to morphology proved to be a challenge for many participants (20%); however, a closer look at survey items offered additional insights into the knowledge and skills of participants in this domain. When asked to define a morpheme, only 21% answered correctly (e.g., *a single unit of meaning*) but nearly half (46%) of participants incorrectly selected the definition of a phoneme (e.g., *single speech sound*). It is interesting to note that one of the first items on the survey asked participants to define a phoneme, and participants did especially well on this item, with nearly 90% answering correctly. Yet, almost half choose the same definition when asked to define a morpheme, raising questions about the confusion of terminology among participants.

Asking participants to count the number of morphemes in a word proved to be quite challenging for teachers, a finding that was also reported in an earlier study of 64 in-service teachers (Crim et al., 2008). For example, only 8% of participants could correctly identify the number of morphemes (i.e., two) in the word *pedestal*. However, on some items, participants performed better. Interestingly, among the three items in which participants performed best, *observer* (60%), *teacher* 57%, and *spinster* (47%), each involved a word that ended with a commonly known morpheme -*er* (i.e., one who) and may have accounted for the higher success rate among participants. Table 5 displays results of the morphological items across studies and

reveals that teachers in this study scored the highest on the majority of items in this domain as compared to participants of earlier investigations (Joshi et al., 2009; Washburn et al., 2011a). This finding is particularly interesting given the overall low score participants achieved in the area of morphology in general (20%).

In contrast, it appears that participants may have applied their understanding of syllables to complete other items associated with identifying the number of morphemes in words. For example, when asked to count the numbers of morphemes in *heaven,* only 28% answered correctly. Given that *heaven* is a word with two syllables, this may explain why 57% of respondents believed the word had two morphemes rather than one. This may also have been the case with the word *pedestal*, with 8% correctly identifying two morphemes in the word, but 52% incorrectly selecting three, which corresponds to the number of syllables in the word. Table 5 displays average percentages for morphological items across studies.

Table 17

Average Percentage Correct of Morphological Items Across Studies

	S1 (2009) *N*=78	S2 (2011a) *N*=91	S3 (current) *N*=65
Number of morphemes in: *observer*	26%	25%	60%
Number of morphemes in: *frogs*	29%	29%	42%
Number of morphemes in: *spinster*	19%	---	47%
Number of morphemes in: *heaven*	40%	29%	28%
Number of morphemes in: *teacher*	48%	45%	57%

Note: S=Study, S1=Joshi et al. (2009) college instructors, S2=Washburn et al. (2011a) pre-service teachers, S3=Lazich (current) in-service teachers

Self-Perceptions of Participants

Given the principal investigator's previous experience working with this group of teachers, it was hypothesized that participants would rate their knowledge as Very Good or Expert in all areas. When asked to evaluative their knowledge (1= minimal, 2= moderate, 3= very good, and 4 = expert) in the five areas necessary for effective reading instruction according to NRP (2000), participants on average rated their knowledge in phonemic awareness the lowest (2.54), followed by phonics (2.71), while comprehension was rated the highest (2.86). Teachers surveyed in this study felt moderately confident in their ability to teach phonemic awareness and phonics.

These lower ratings of knowledge among participants were not only unexpected, but also differed from those reported in an earlier study of exploring 722 teachers' perceptions of their knowledge in phonemic awareness and phonics (Cunningham et al., 2004). When rating their perceived knowledge with their actual knowledge, teachers in the current study had a better understanding of their ability as evidenced by the scores in the domains of phonemic awareness and phonics. Of the eight total areas, teachers in the present study rated themselves the lowest in teaching literacy to English language learners (1.84). Overall, this means that teachers believe their ability to instruct this population of students is weak.

Self-perception ratings obtained in the current study were similar to those reported when the BLCS was administered to college instructors responsible for teacher reading education courses. Participating instructors rated their knowledge in phonemic awareness (2.56) and phonics (2.51) as the lowest of the five areas critical for early literacy instruction and their ability to teach literacy to English language learners (2.04) as the lowest (Joshi et al., 2009).

Relationship Between Knowledge, Skills, and Perceptions

Previous experience working with this sample of teachers led the principal investigator to anticipate a discrepancy between study participants' perceptions, knowledge, and skills. In this investigation, the following relationships were explored: 1) participants' rating of knowledge of phonemic awareness, the two phonemic awareness scales, and two phonemic awareness items from the survey; 2) participants' rating of knowledge of phonics and the two phonics scales; and 3) participants' rating of knowledge of vocabulary and the morphology scale.

Participants' rating of knowledge of phonemic awareness, the two phonemic awareness scales, and two phonemic awareness items from the survey revealed a statistically significant relationship. These findings indicated that those teachers who correctly defined a phoneme were also more confident in their knowledge in phonemic awareness. Yet, only 24% of participants could correctly identify the correct definition of phonemic awareness. Findings also revealed a second significant relationship among phonemic awareness skills. Participants who scored higher on tasks on phoneme segmenting (34%) also scored higher on tasks on phoneme reversals (44%). In other words, if participants were successful at one task in the area of phonemic awareness, they were most likely successful at the other.

In phonics, participants' rating of knowledge of phonics and the two phonics scales also revealed a significant relationship. Those teachers who were successful at items related to their knowledge of basic syllables were also confident in their knowledge of phonics. A final relationship regarding participants' rating of knowledge of vocabulary and the morphology scale was also found to be significant. Teachers who rated their knowledge higher in vocabulary did well on morphology items. Items in this scale reflected a balance of knowledge- and skill-based items related to morphology.

Relationship Between Knowledge, Skills, and Perceptions and Demographic Variables

Given that the domains of phonemic awareness and phonics are more closely associated with early literacy instruction, it was hypothesized that teachers in the preschool through third grade band would score higher in both domains; however, results indicated otherwise. Teachers in grades four through eight were reportedly more confident in their knowledge in phonemic awareness than teachers of the earlier grades. This finding is rather interesting in that phonemic awareness instruction does not typically take place in the upper grade levels. In fact, the NRP (2000) suggested grades kindergarten through first grade as the most effective time for instruction in this area. While phonics, specifically advanced decoding skills, could be expected as part of the upper grade level band, phonemic awareness is typically not. Findings also indicated a relationship between years of teaching experience and perceived levels of knowledge in vocabulary. In other words, those teachers who were more experienced rated themselves as more confident in the area of vocabulary.

Results of the study indicated that participation in professional development offered through the foundation-university partnership in the previous year did not have an effect on scores of in-service teachers in this study. According to the literature, attempts to increase teacher knowledge are successful when professional development is provided. However, it is important to note that previous studies have evaluated the immediate impact of short-term professional development (Brady et. at., 2009). In this investigation, teachers completed the BLCS nearly one year after participating in the professional development. Therefore, the time lag may have contributed to this finding. Additionally, the small sample size and the relatively low percentage of teachers participating in the professional development (38%) may have contributed to this finding.

Research also indicates that professional development comprised of initial intensive sessions, on-going support by coaches, and follow up with additional sessions during the school year that are reflective of topics raised throughout the school year are effective (McCutchen et al., 2009). Participants in this study were afforded professional development on a smaller scale, with only one visit with a coach over the course of the school year. Further related to professional development, studies have indicated that attitudes may be at play, such that, those teachers who appeared to attend sessions simply to earn continuing education credits learned less content. Furthermore, new teachers welcomed the learning of new content while veteran teacher reported no value (Brady et al., 2009). Given the relatively large number of experienced and veteran teachers in this sample, attitudes towards the professional development offered to study participants in previous year may have contributed to no effect being reported.

Open-ended Question

Participants were given the option of sharing additional information about their knowledge or perceptions related to the foundations of literacy, literacy instruction, and/or assessment. Nearly all participants choose not to share any additional information. Of the few who did, only one comment provided additional insight as it relates to literacy instruction. This participant shared, "This is complex and very targeted. I find it fascinating." The items on the BLCS are similar to those that take place in early literacy classrooms, yet this participant believes these same tasks are complex. The word "fascinating" used in this comment also draws attention to the idea that these tasks are out of the ordinary and not typical in an educational setting. Yet, these are the same tasks shared by the NRP as necessary for effective reading instruction.

Limitations

The findings of this study add to earlier research investigating teacher knowledge, skills, and perceptions associated with the constructs necessary for early literacy instruction. However, the limitations of the present investigation are acknowledged. While the foundation invited 150 teachers to attend the free professional development session, only approximately 100 attended. Given the university partnership, a request to participate in research studies is something many of the teachers have been asked to do before. Therefore, it was anticipated that nearly all would agree to participate in this study; however, less than expected agreed to participate. While the number of participants of the current study was comparable to some studies on this topic, ranging from 54 to 65 (Crim et al., 2008; Brady, 2009; Martissuen et al., 2015), only 65 teachers elected to complete the BLCS as part of the current study. This resulted in a small sample size that limited the type of statistical analyses that could be conducted.

For example, when examining relationships between participants' scores and demographic variables, restrictions due to small sample size limited the insights that could be gained. Further, this smaller sample size made it difficult to create scales with adequate reliability, which in turn limited the number and type of analyses that could be conducted. In this investigation, a total of five scales were created, two related to phonemic awareness skills, two associated with phonics knowledge, and one related to morphological knowledge and skills. As reported earlier, scores on knowledge-based items were much lower than among participants than skill-based items and this difference could have contributed to difficulties with creating scales with adequate reliability. While the small sample size may require caution in interpreting findings and limit the generalizability of the results, the results of the present study are similar to other studies investigating disciplinary knowledge necessary for early literacy instruction. The

gaps between knowledge and skills items, similarities in scores among domains in general, and domain specific items in particular, serve to bolster the findings obtained in the current investigation and lessen the sample size limitations to some degree.

While this study contributes to the literature on teachers' knowledge, skills, and perceptions, the study did not directly investigate other variables that have reportedly impacted teacher knowledge. For example, specific information regarding the teachers' preparation was not collected. While a high percentage of the participants reportedly earned either a bachelor's (51%) or master's degree (42%), the study did not specifically investigate their preparation to teach reading. Binks-Cantrell et al., (2012) suggested the *Peter Effect* as a potential factor impacting teacher knowledge and skills. In other words, teachers taught by college instructors who lack knowledge in the basic language constructs necessary for early literacy instruction will likely lack this knowledge themselves. Secondly, while the present study did seek to determine the impact of attending a professional development series on teachers' knowledge and skills, it did not consider teachers' attitudes towards professional development or evaluate the impact of instructional coaching.

Findings in Chapter 2 report that teacher knowledge can positively impact the growth of students (Lane et al., 2008). There is evidence that students placed in classroom with knowledgeable teachers tend to perform better than those placed in classrooms with teachers who are lacking knowledge. Unfortunately, the present study did not evaluate levels of student achievement or levels of improvement in comparison to teacher knowledge. Research findings also suggest that higher levels of knowledge in phonemic awareness and phonics impact the amount of instructional time teachers allocated to these skills during a literacy instruction block (Swerling & Zibulsky, 2013). In other words, teachers who lack necessary content knowledge

dedicate less instructional time to these areas deemed necessary by the NRP. In contrast, those teachers possessing high levels of content knowledge were found to be more likely to devote instructional time in these recommended areas. The present study did not evaluate the impact of teacher knowledge and skill on the ability of teachers to effectively plan for literacy instruction.

Finally, potential limitations in the instrument used in this study (i.e., BLCS) were identified. Most notably, there was a lack of balance between knowledge (12 items) and skill (26 items) items across the survey in general, and in some areas specifically. For example, in the phonological awareness and morphological domains, there was only one knowledge-based item and all remaining items were skill-based. As previously indicated, a closer look at the domain of phonological awareness highlighted a limitation in the survey items used to assess teachers' understanding. Relying solely on one phonological awareness skill, syllable counted, provided a limited measure of participants' skills in this domain. Similarly, questions related to vocabulary were limited to morphological features and did not assess other features typically related to vocabulary instruction such as prefixes, suffixes, synonyms, context clues. That said, scores of participants in the morphological domain may not be as poor as they appear. Perhaps the score earned in this area is simply reflective of participants' ability to count morphemes and not their knowledge and skills of morphology in a more general sense. Additionally, the BLCS required participants to rate their perceptions in all five areas of the NRP, but did not include questions associated with each area. In other words, while participants rated their knowledge in fluency and comprehension, no questions were included in the survey that assessed either domain.

Directions for Future Research

To overcome the limitations of the present study and further add to the literature, several recommendations for research are offered. Future work in this area should aim to solicit

additional participants in order to increase the sample size, as conducting a similar study with a larger sample will further support the findings obtained. For example, expanding the sample to include parochial schools in the suburbs of the large midwestern metropolitan city in which this study was conducted in could assist in increasing the sample size. To explore the impact of teacher preparation programs, additional studies could be conducted to evaluate the impact of teacher education on in-service and/or teacher candidate knowledge. Further explorations of the *Peter Effect* could also provide additional insight to support the preparation of teachers of reading.

Additional studies exploring the impact of professional development should also be conducted in order to examine the various components that lead to increased teacher knowledge and skills and to ensure practicing teachers are adequately supported in teaching children to read. While previous studies have evaluated the immediate impact of short-term professional development with teachers, future studies should examine long-term opportunities. For example, in one study teacher educators were involved in professional development on research-based reading instruction that spanned three-years and encompassed a wide-variety of activities. The results of this study demonstrated the positive impacts on knowledge and skills as a result of participating (Binks-Cantrell et. al., 2012). The inclusion of pre- and post- assessment would also afford the opportunity to document growth among study participants. While attempts to increase teacher knowledge and skills among college instructors, pre-service, and in-service teachers show promise, the research does not report the maintenance of the knowledge and skills acquired. Implementing studies of this type would offer evidence that teachers continue to maintain higher levels of knowledge over time.

Hollenbeck and Kalchman (2013) highlighted the idea of "pedagogical discontentment" (p. 649), or the recognition and feelings of displeasure associated with the mismatch between goals and practices, as part of a teacher's reflective process. In the context of this study, a parallel could be drawn in relation to teachers' perceptions of their knowledge and skills. As a way to address teacher's attitudes and motivation, future studies should consider sharing individual survey data with teachers as a possible motivator for improvement. Cunningham et. at., (2004) also refers to a lack of calibration, or simply put, teachers don't know what they don't know. Sharing survey data in future studies could also allow teachers to identify gaps in their own knowledge skills, recognize the need to improve, and plan for their own professional development. Future research investigations could explore the process used by teachers who are afforded these opportunities.

Given the evidence that teacher knowledge can positively influence the growth of students (Lane et al., 2008), future investigations should be conducted to further investigate this finding. Studies conducted in this area should focus on evaluating levels of student achievement or levels of improvement in comparison to the disciplinary knowledge of their teachers. As such, these explorations would continue to support the importance of having knowledgeable teachers in all classrooms. Swerling and Zibulsky's (2013) research suggest that teachers who lack necessary content knowledge have been found to dedicate less instructional time to areas deemed essential for early literacy instruction by the NRP. To explore the impact disciplinary knowledge has on instruction, investigations could examine instructional planning and delivery in early literacy classrooms. For example, studies could include viewing lesson plans, observing instruction, and interviewing teachers to help understand the impact teacher knowledge has on the instructional planning and delivery.

In future explorations of disciplinary knowledge, developing a more balanced instrument to assess teachers' knowledge, skills, and perceptions is also recommended. Evaluating teachers in early literacy instruction requires a tool with an adequate balance between knowledge and skills in order for researchers to have greater confidence when interpreting findings. Greater diversity among items within various domains of early literacy will also contribute to confidence in the finding achieved in each domain. It is important to assess the multiple skills that make up each domain to ensure a well-rounded view of participants' knowledge and skills rather than a limited understanding. Studies evaluating the psychometric properties of a newly developed tool, followed by studies employing the instrument with various populations (e.g., college instructors, pre- and in-service teachers), are also recommended.

Conclusion

Those tasked with teaching children to read must have a deep understanding of essential components within the domain of early literacy instruction. First, a theoretical framework such as the one outlined by Chall (1983), along with the findings of the National Reading Panel (2000), can provide a strong foundation for the disciplinary knowledge required to teach children to read. A working knowledge of terminology and adequate skills in the domains associated with early literacy instruction is also critical. For over 20 years, teachers' disciplinary knowledge in these domains have been questioned and investigated. Studies continue to reveal that teachers lack essential knowledge and skills needed to teach young readers or older readers experiencing reading difficulties.

This lack of knowledge among practicing teachers is of great concern; however, the basis for this concern may be out of their control and no fault of their own. Findings of recent studies indicate that those college instructors responsible for preparing teachers to teach reading also

lack essential knowledge and skills in the domains of early literacy instruction (Joshi et. al., 2009; Binks-Cantrell et. al., 2012). In fact, teachers in the present study scored higher on skill items when compared with a sample of college instructors who had not received three-years of professional development in research-based reading practices and similarly to those who had (Binks-Cantrell et. al., 2012). While teachers need this disciplinary knowledge, simply put, they may not have been afforded an opportunity to learn this critical information during their teacher preparation.

This study contributes the growing body of research and draws attention to this urgent matter facing our teachers today. In order to move forward in solving this dilemma, it is important that future investigations continue to assess teachers in this domain. However, it is equally important for future investigation to share results of any assessments with teachers. While it is clear that teachers must have a deep understanding of this disciplinary knowledge, it is unclear if they understand their low levels of knowledge. Investigations attempting to increase this knowledge of practicing teachers should focus on offering extended professional development in place short-term programming. Exploring the role of coaching support to deepen these learning opportunities can strengthen future investigations. Ultimately, the evaluations exploring teacher knowledge and influences in the growth of students should encompass the purpose for all investigations. This lack of knowledge among teachers today is certainly one of urgency and is unfortunately is not limited to this population, but rather to those preparing future teachers as well.

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