THE DEVELOPMENT OF FIRST GRADERS' WORD KNOWLEDGE IN
CLASSROOMS WHERE TEACHERS ARE IMPLEMENTING A MANDATED PHONICS
CURRICULUM

A Dissertation
by
ASHLEY ELIZABETH PENNELL

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**Abstract**

THE DEVELOPMENT OF FIRST GRADERS' WORD KNOWLEDGE IN
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CURRICULUM

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This dissertation examined the reading and spelling development of 89 first-grade students in an instructional context where students received a minimum of 40 minutes daily mandated phonics curriculum. The National Reading Panel report (NRP, 2000) established the importance of including an explicit, systematic phonics curriculum as part of an effective language arts program for beginning readers; however, few attempts have been made to further investigate the role of such instruction on both early reading and spelling development as it unfolds in a naturally-occurring classroom context. Using a longitudinal design, this study captured the students' development along several dimensions, including word recognition in isolation, spelling, and oral contextual reading. The nature of the literacy instruction in the six participating classrooms was documented through observations of classroom instruction and teacher questionnaires.

Results indicated that for students across three reading-readiness groups (low-, average-, and high- readiness at the start of first grade) there was a larger discrepancy between their automatic word recognition skill than their spelling skill; that is, students who were similar in their spelling skill were different in their automatic recognition of the same words. The discrepancy between word recognition and spelling was most pronounced for students in the low reading-readiness group. The findings of this study complemented and extended existing theories of early reading and spelling development (Ehri, 1998; E. Henderson, 1981; Morris et al., 2003), suggesting that this specific instructional context may reveal a more nuanced trajectory for students who enter first grade with limited word recognition skill.

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## Dedication

This dissertation is dedicated to all of the children I have known who were learning to read and to all of the teachers who were learning to teach them.

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## Chapter One

## Introduction

Over the past four decades, researchers interested in early literacy development have attempted to explain how young children learn to read and spell. In doing so, they proposed a developmental trajectory for the acquisition of reading and spelling skills (see Chall, 1983; Ehri, 1998; E. Henderson, 1981; Morris et al., 2003). This trajectory has been widely accepted and has remained relatively unchallenged. A central tenet of this theory is that while aspects of reading and spelling involve different processes, there are shared cognitive elements and their development relies on a shared knowledge base. Reading and spelling develop in a reciprocal, mutually supportive relationship with each other (Ehri, 1997; E. Henderson, 1992; Morris & Perney, 1984; Perfetti, 1992, 1997; Stuart & Coltheart, 1988).

Because these skills develop reciprocally, researchers have been able to identify variables that affect the development of both reading and spelling. For example, the alphabetic nature of English orthography dictates that learning to read depends on the acquisition of the alphabetic principle - the knowledge that letters represent specific sounds (Adams, 1990; Ehri, 2014; Moats, 2000; Rayner et al., 2001; Venezky, 1999). In the same way, children's growing knowledge of the alphabetic principle can be observed through their invented spelling (Ehri, 1992a, 1998; E. Henderson, 1981, 1985). Children's use of invented spelling demonstrates an awareness of the relationship between letters and sounds when the exact letter-sound correspondences are unknown. For reading and spelling to develop, children must attend to individual sounds in spoken words, a skill known as phonemic awareness (Snow et al., 1998). Phonemic awareness is advanced through formal teaching and learning opportunities and engagement with language. As children develop phonemic

awareness, they acquire and store increasingly more information about words and word parts that they use in their attempts to read and spell new words (Adams, 1990; Ehri, 1998; Morris et al., 2003).

Many researchers have identified automatic word recognition as the best contributor to reading fluency and comprehension (Ehri, 2005; Gough, 1984; Roberts et al., 2011; Stanovich, 1991). Even more important, perhaps, is the strength of the relationship between early word recognition and future reading development (Cunningham & Stanovich, 1997; Stanovich, 2000). In the early grades, word recognition skill is a predictor of overall reading skill (Juel et al., 1986; Morris & Perney, 2018; Perfetti, 1985; Stanovich, 1986). Increased skill in decoding words, which is the process of translating print to speech using knowledge of letter-sound relationships, allows readers to become unglued from print and to begin reading some words with automaticity (Chall, 1983). Once word-level processes are made automatic, the focus of reading shifts to comprehending the text. This ability to read words with automaticity, or by sight, is what drives the reading process forward.

Researchers hypothesize that the same word knowledge that is used in reading words is also used in spelling words (Ehri, 1997; E. Henderson, 1992; Morris & Perney, 1984; Perfetti, 1997; Stuart & Coltheart, 1988). Theoretically, a child who brings a limited knowledge of letter-sound relationships as represented by their incomplete spellings of words are thought to bring the same limited knowledge to their reading of words. In this way, spelling is thought to provide a window into developing word knowledge (Ehri, 1998; E. Henderson, 1985). Ehri (1998) conceptualized a developmental sequence through which children move as they learn to read words, while E. Henderson (1985) conceptualized a similar sequence through which children move as they learn to spell words. In both

developmental models, children begin with a primitive understanding of the alphabetic system that becomes increasingly complex through experiences with written language. As children acquire increasingly more information about the alphabetic system, they use this knowledge to both read and spell words.

E. Henderson (1981) theorized that "word knowledge is the result, not the cause of reading" (p. 102). As such, word knowledge both contributes to reading and spelling development and is the by-product of reading and spelling practice. In other words, children improve reading by reading and spelling by spelling. With this in mind, the nature of reading and spelling instruction is of central importance. Word recognition and spelling development are not likely to progress spontaneously; instruction and experiences with words influence skills in these areas (E. Henderson, 1981; Morris et al, 2003).

In the section that follows, I describe a case of a beginning reader whose reading and spelling profile represents the issue that this dissertation seeks to understand. The description of this student's reading and spelling skill includes specific examples from my work with them to demonstrate how their skill in spelling did not closely align with their skill in reading. This case is examined to contrast the observed patterns of development against the models of early spelling and word recognition development outlined in the literature review in chapter two.

**Alex's Case**

*A few years ago, I began tutoring a first grader, Alex, whose older sibling had participated in a summer reading clinic at my university. When I met Alex, their mother expressed concern that they were not making progress in reading and would soon be evaluated for special education. I agreed to administer an informal reading assessment to*

*Alex to determine if they might benefit from tutoring services. My assessment indicated that Alex could not read simple texts with ease, but I was not overly concerned since they were at the beginning of their first-grade year. I was, however, perplexed by their ability to spell words that they would only have encountered through reading books. Alex correctly (and effortlessly) spelled words like **came**, **rode**, and **shake**, often reciting specific "rules" that informed their spelling. For example, Alex knew that the word **came** has an "e" at the end because "it makes the a say its name." Some might consider Alex's adeptness in applying phonics knowledge in spelling words to be a sign that they were learning to read, but I was concerned. While Alex could spell many of the words in their first-grade phonics curriculum, they could not read any of them. In fact, there were very few words that Alex could read. For example, Alex could spell words like **hat**, **win**, and **pick** but could not read words of the same orthographic complexity. Intrigued by the mismatch in Alex's spelling and reading skill, I decided to tutor them to see if I could aid their progress in reading.*

*After forty one-hour tutoring lessons, Alex made progress in reading, but not without intensive and persistent focus on moving away from the sound-by-sound approach that had allowed them to spell words that they could not read. Alex's progress in word recognition moved very slowly. If Alex encountered the word **rat** in a short text, they stumbled over it, working through the sounds sequentially from left-to-right and ultimately producing a string of individual sounds that they did not recognize as a whole word. As Alex's command of orthographic patterns continued to grow in writing (e.g., they began correctly representing r-controlled vowel sounds in words like **barn** and **bird** and long-vowel markers in words like **chain** and **team** when spelling words), their skill in reading words made much slower progress. Since meeting Alex four years ago, I have worked with many other beginning*

*readers who presented a similar profile in their development of reading and spelling skill,*

*which has led me to investigate this phenomenon of children correctly spelling words that*

*they cannot yet read.*

**Statement of the Problem**

As previously stated, researchers have established that reading and spelling are two

different skills that rely on a shared knowledge of words (Adams, 1990; Ehri, 1998; Morris

& Perney, 1984; Morris et al., 2003; Perfetti, 1997). As such, spelling and reading skills

should be closely related in their development. Alex's case, described in the previous section,

did not evidence a reciprocal relationship between the development of reading and spelling

skills. Alex could correctly spell words like **man, wish**, **stop**, and **take**, but could not read

words of the same orthographic complexity. Alex could also not read frequently occurring

words like **my**, **that**, and, **when**, which are necessary to read simple texts independently.

Alex correctly represented letter-sound correspondences when spelling words, which

suggested a relatively sophisticated word knowledge; however, their skill in reading words

was quite limited. This mismatch between Alex's spelling and reading skill indicated that the

underlying word knowledge they used when spelling words was not fully utilized when they

were reading words. Alex's pattern of development differed from the widely accepted

theories of reading and spelling development (Ehri, 1997; E. Henderson, 1992; Morris &

Perney, 1984; Perfetti, 1997), which led me to wonder what is allowing Alex to correctly

spell words that they could not read with any degree of automaticity.

One hypothesis is that the current instructional methods used to teach early reading

and spelling are influencing this development. Barr (1974-1975) found that first graders'

early word-reading development was influenced by classroom instruction. In a series of

studies, she found that children used word-reading strategies that were consistent with the

instructional emphasis in their classrooms (i.e., phonics versus sight word strategy; Barr,

1972, 1974, 1974-1975). Other researchers came to the same conclusion regarding children's

initial word reading strategies, lending further support to the theory that instructional

methods and materials influenced early reading (A. Cohen, 1974-1975; Juel & Roper-

Schneider, 1985; Lesgold & Resnick, 1982). Given these insights about instructional

influence, it is reasonable that the current emphasis on phonics instruction in first-grade

classrooms is influencing the word knowledge that children bring to the task of reading and

spelling words.

In 2000, the National Reading Panel (NRP) convened to identify the most effective

components of literacy instruction. They concluded that phonics instruction led to improved

reading outcomes for beginning readers. The term *phonics* does not pertain to a specific

instructional method. It is instead instruction that teaches the relationships between sounds

and letters. Stahl (1992) defined phonics as the "various approaches designed to teach

children about the orthographic code...and the relationships of spelling patterns to sound

patterns" (p. 618). Children use this knowledge to read and spell familiar and unfamiliar

words. Another important finding concerning the teaching of phonics was that young

children who received phonics instruction performed better with decoding words, spelling,

reading fluency, and reading comprehension. More specifically, the report found that

systematic phonics instruction, which follows a planned, sequential curriculum, was superior

to non-systematic phonics or none at all.

The NRP report makes clear that phonics instruction does not equal a complete

reading program for beginning readers. Systematic phonics instruction, which provides a

venue for learning about the relationships between letters and sounds, is an essential, but not sufficient condition for teaching children to read. Ehri et al. (2001) asserted that "phonics instruction itself does not help students acquire all the processes [beginning readers] need to become successful readers. Phonics needs to be combined with other essential instruction components" (p. 433). Put another way, the automaticity in reading words that leads to fluent, skilled reading is not a result of merely learning to decode letter by letter, sound by sound; readers need many opportunities to apply phonics skills in connected, meaningful text. Until recent years, the publication of the NRP report silenced the longstanding debate over the most effective method for teaching children to read (known as the "reading wars") and systematic phonics acquired a primary role in literacy instruction in the early grades. Since the NRP's publication, the effects of phonics instruction in the early grades have been documented through empirical studies comparing instructional methods and interventions (Berninger et al., 2003; Denton et al., 2006; Roberts & Meiring, 2006). However, at present, no such study has examined beginning reading and spelling development as it occurs in this specific instructional context as it naturally unfolds in the classroom setting. If the trend of spelling skill progressing more rapidly and completely than word recognition skill extends beyond cases like Alex and other students in my university's reading clinic, our current theoretical understanding of the development of these skills may be inadequate. To examine this phenomenon systematically, the present study investigated whether cases in which spelling skill developed more quickly than reading skill exist in a sample of first-grade students receiving explicit, systematic phonics instruction.

First, this researcher collected data to capture and describe the reading and spelling development of first-grade students in this instructional context. Secondly, this study also

examined the relationship between these skills as they developed. If reading and spelling operate from a shared knowledge of written language, children's skills in these areas should be closely intertwined in their development. In other words, based upon current models of literacy development, spelling skill would be unlikely to significantly surpass reading skill in children at the earliest stages of reading development. Current theories suggest that reading and spelling should offer a reflection of the same growing knowledge of words. To this end, this study captured early reading and spelling development within a specific instructional context. The following research question guided this study: How do reading and spelling develop in first graders receiving a minimum of 40 minutes daily mandated phonics curriculum?

**Significance of the Study**

Most recently, there has been a renewed public interest regarding the importance of phonics instruction in teaching children to read. In 2018, American Public Media published the first of a series of radio documentary reports claiming that teachers: (a) lacked explicit phonics knowledge, (b) failed to implement phonics instruction, and (c) failed to affect reading growth in all of their students (Hanford, 2018a). A number of articles and commentaries appearing in popular media outlets, such as *The New York Times* and *National Public Radio (NPR)* followed this documentary and asserted that phonics was not being taught to children in the early grades (Hanford, 2018b, 2019a, 2019b). Collectively, these articles argued that colleges of education are not teaching phonics to pre-service teachers, leaving teachers to rely on reading programs that lack adequate phonics instruction. In response to this public conversation, researchers responded (see Calkins, 2019; Castles et al., 2018; Seidenberg, 2019; Treiman, 2018) and professional organizations published briefs (see

International Literacy Association, 2018, 2019a, 2019b; National Council for Teachers of English, 2019; Reading Recovery Council of North America, 2019) summarizing what is known about the value of phonics instruction while also emphasizing the limited role that phonics plays in effective literacy instruction. This issue is not the focus of this dissertation, but it highlights the state of public understanding surrounding phonics instruction in schools currently. As the national conversation about the methods, materials, and volume of phonics instruction intensifies, it is critical that we understand the influence of this instruction on early reading and spelling development.

There is evidence establishing the critical role of phonics instruction for beginning readers. However, the long-term influence of the phonics methods currently implemented in early elementary classrooms across the United States has received relatively little attention. The NRP report established the importance of including a phonics curriculum as part of an effective language arts program for beginning readers; however, few attempts have been made to further investigate the role of explicit, systematic phonics instruction on both early reading and spelling development. This study is significant for the following reasons:

1. Phonics is a fundamental part of literacy instruction in the early grades and is implemented in classrooms across the country.

2. The studies that inform our current understanding of beginning reading and spelling development were not conducted within the context of explicit, systematic phonics instruction.

3. The studies that have investigated phonics since the NRP's report are primarily evaluations of different methods of phonics instruction.

Using a longitudinal quantitative design, this study captured the early literacy development of first-grade students along several dimensions, including word recognition, contextual reading, and spelling. Additionally, the nature of the literacy instruction offered in the participating classrooms was documented through observations and teacher questionnaires. This study is exploratory in nature. That is, it investigated whether cases of development in which skill in spelling was more advanced than skill in reading occur in a sample of first-grade students receiving explicit, systematic phonics instruction. Results of this study may provide insight into the gaps in the current theoretical and pedagogical understanding of beginning reading and spelling development. For example:

- Do beginning readers receiving explicit, systematic phonics instruction follow the developmental trajectory of reading and spelling as described in our current models?
- Do reading and spelling skills develop in tandem in the context of explicit, systematic phonics instruction?
- Do these skills develop simultaneously, where growth in one area influences growth in the others or do they develop separately?

## Chapter Two

## Review of the Literature

Ultimately, the goal of reading is to construct meaning from print. While several factors can affect reading achievement, such as prior experiences, background knowledge, content knowledge, and motivation (see Cervetti & Hiebert, 2015), this study investigated the development of reading and spelling skills in the context of explicit, systematic phonics instruction. As such, this literature review focuses on theories and models that support our understanding of reading as a cognitive process.

Skilled reading depends on the complex coordination of the cognitive processes involved in processing written language (Adams, 1990). When skilled readers process text, they read most of the words, and they do so with relative ease (Perfetti, 1985; Rayner & Pollatsek, 1989). Furthermore, eye movement research indicates that words are not processed letter by letter, but instead, as chunks of information consisting of orthographic, syntactic, and semantic content (Carpenter & Just, 1981). Reading words is a highly efficient and automatic process rooted in a robust knowledge of the symbols, sounds, and meanings of words (Adams, 1990).

Over the past forty years, researchers have studied the processes through which young children progress as they learn to read and spell (Chall, 1983; Ehri, 1998; E. Henderson, 1981; Morris et al., 2003). E. Henderson (1992) argued that reading relies on the successful integration of oral and written language. Such integration hinges upon knowledge of the orthographic patterns that translate spoken language into print (i.e., reading the words on a page; Juel et al., 1986). Thus, children's progress in reading requires learning to read words (Adams, 1990; Ehri, 1987, 1995, 1998; Gough et al., 1992; Perfetti, 1985).

However, skilled reading is not simply decoding (i.e., using letter-sound knowledge to convert symbols to sounds); proficient reading hinges on the acquisition of automatic word recognition. Automatic word recognition, which is the ability to read words accurately and effortlessly, is the most reliable predictor of reading comprehension for skilled readers (Perfetti, 1985). Such automaticity avails cognitive resources for comprehension processes. Reading, after all, is the product of decoding and comprehension (Gough & Tunmer, 1986; Hoover & Gough, 1990). In the absence of strong print-processing skills, which facilitate efficient access to written text, the outcome of this equation is not fully realized. Skilled reading depends on the automatic recognition of words.

**Our Alphabetic Language**

In alphabetic orthographies such as English, symbols represent individual sounds, known as phonemes, and understanding the alphabetic system requires learning these letter-sound relationships (Venezky, 1999). Alphabetic orthographies where there is a one-to-one relationship between letters and sounds are considered transparent (e.g., Finnish, Spanish). However, complex letter-sound correspondences contribute to the lack of transparency of the English orthography (L. Henderson, 1982). An understanding of these sound-symbol correspondences enables readers to decipher the English written language; it opens up the possibility of learning to read and spell.

English orthography includes three layers of representation: phonemic, syllabic, and morphemic, where each layer builds on the previous one (E. Henderson & Beers, 1980). The phonemic layer, which is the most basic layer of the orthography, involves the individual units of sound that exist in oral language. These single units of sound, or phonemes, are the essential entry-point into written English. The syllabic layer references the patterning of

syllables and the morphemic layer the patterning of morphemes (i.e., units of meaning). Although skilled reading utilizes knowledge about all three layers of written language, the nature of the reading process demands that readers attend to the phonemic layer first.

English written language is more complicated than might be assumed based on the fact that there are only 26 letters in the alphabet. However, using letter combinations in written English yields multiple ways to represent the set of phonemes in English (Venezky, 1999). In other words, the English language consists of slightly more than 40 sounds (depending on dialects), but there are nearly 70 letters or combinations of letters used to spell them. Some letters represent multiple sounds. For example, the letter "g" represents different phonemes in the words *golf* and *gym* and is silent in the words *sigh* and *gnat*. Additionally, some phonemes in English are not represented by a single symbol, but by a combination of letters (digraphs). For example, the phoneme at the beginning of the words *chop* and *cheese* is a single unit of sound represented by two letters.

For most skilled readers, the rules that govern our language are known tacitly (Adams, 1990; E. Henderson, 1985). Skilled readers can distinguish correct spellings from incorrect ones, but, barring formal instruction in English orthography, may not be able to identify the reasons for the correct spelling. Although it is complex, the English writing system is also relatively predictable and systematic (Adams, 1990; C. Chomsky, 1970; N. Chomsky & Halle, 1968; L. Henderson, 1982; Venezky, 1999). Nearly 50 percent of the words in English have predictable spelling patterns based on letter-sound relationships (Hanna et al., 1966). Readers must make sense of, and use fluently, the alphabetic system for word recognition and spelling to progress; otherwise, acquiring these skills will be all but impossible. It is the growing knowledge of the structure of written words that facilitates

advancement in reading and spelling skill (Adams, 1990; E. Henderson, 1981; Morris & Perney, 1984; Morris et al., 2003).

**Spelling Versus Reading**

Many researchers hypothesize that spelling and reading use the same knowledge, even though reading requires decoding and spelling requires encoding (Ehri, 1989, 1997; E. Henderson, 1992; Morris & Perney, 1984; Perfetti, 1992, 1997; Richgels, 2001; Stuart & Coltheart, 1988). Reading is a task in which written symbols serve as visual stimuli for the sound representation in the form of phonemes. The visual stimuli in the form of letters and orthographic patterns are decoded to activate information about the pronunciation and meaning of a word. In contrast, spelling begins with the individual who uses knowledge of the English written language system to produce the letters and patterns that represent the phonemes in a word. Spelling a word involves producing an output where phonemes encode to written text (Cronnell, 1978; Venezky, 1970). E. Henderson (1992) described the relationship between reading written text and generating written text:

> ...Spelling, the alphabetic principle, and the orthographic features by pattern
> and meaning that flow from it, are the central core of literacy. Reading
> nourishes this gradually elaborating construct, writing automatizes it. (p. 23)

While the tasks involved in reading and spelling may employ different skills, both reading and spelling are linguistic tasks that require activation of the knowledge of letters, sounds, and the relationships between them. As E. Henderson (1992) illustrated, each process plays an essential role in furthering readers' competence with the written language system. Readers apply orthographic knowledge when they decode printed words. Spelling words to produce written text requires the

representation of this same orthographic knowledge. Both skills are fundamental to literacy development, and in fact, many researchers consider them to be mutually supportive, interactive processes (Ehri, 1989, 1997, 1998; E. Henderson, 1981; Perfetti, 1992).

**The Development of Spelling Skill**

The ability to spell words in English builds on the emergent skills of letter recognition and letter formation; but it is not just the production of letters on a page. For young children, spelling requires conscious attention to thinking about words, letters, and sounds to produce a written product. Spelling is not an arbitrary task that depends on rote memorization; it is a linguistic task that requires knowledge of the relationships between letters and phonemes. The sophisticated word knowledge that good spellers use when they spell new words facilitates memory for the letters in words, known as orthographic memory (Ehri, 1998, 2000). Treiman (1998) described the process of spelling words for young children:

> ...Spelling is a creative linguistic process rather than a learned habit involving rote visual memorization. Young children create spellings for words based on their knowledge of language and their knowledge of print. They do not merely memorize letter sequences. (p. 390-391)

Acquiring correct spellings of words is not a function of rote memory; instead, it is driven by the development of an increasingly complex understanding of written language. In this way, many consider spelling a tool for revealing insight about children's emerging orthographic knowledge, claiming there is order in what children do when they attempt to spell words they do not yet know (C. Chomsky, 1970, 1979; E. Henderson & Beers, 1980; Read, 1986; Read & Treiman, 2013).

*Early Research in Spelling Development*

C. Chomsky (1970, 1979) was one of the earliest and most influential researchers in early spelling development. In her seminal text on invented spelling, C. Chomsky (1979) contended that young children's knowledge about the alphabet – including the names of letters and their corresponding sounds – provides an entry point for their early attempts to produce written text. As such, children represent sounds in words consistently and accurately by inventing their spellings. C. Chomsky further argued that experimentation with spelling, the concrete aspect of word knowledge, builds the background knowledge that will be needed to begin reading. While the spelling skill that C. Chomsky described is different from standard spelling, the way children represented sounds in words was systematic. In other words, C. Chomsky noticed that when children used their best judgment to spell words, their invented spellings were reasonably predictable from child to child.

C. Chomsky's proposal about what these creative spellings might mean for the process of learning to read, and the role of written text production in fostering this process, are perhaps her most important contribution. C. Chomsky (1981, as cited in Read & Treiman, 2013) compared children's early spellings to artwork, acknowledging that the child must guide the creation. Building on Piaget's (1972) assertion that children develop real understanding when they come to an understanding through invention, C. Chomsky (1971) claimed that children should "write first, read later," arguing that authentic writing experiences contribute to a lasting understanding (p. 296).

Influenced by C. Chomsky's (1970) theories of early spelling-sound knowledge, Charles Read, a linguist and former teacher who studied under C. Chomsky, undertook a systematic study of young children's knowledge of written words. Through an analysis of

preschool children's natural and spontaneous spellings of words, Read (1971, 1975) noted uniformity in errors that changed over time. These errors included the following patterns:

1. Most consonant sounds, especially the beginning consonant in a word, were represented correctly (e.g., "bump" = BOP; "kite" = KIT).

2. Consonant blend errors were logical – the errors made sense given the children's limited knowledge of spelling patterns (e.g., "trade" = CHRAD; "drum" = JRUM).

3. Long vowels were not represented correctly, whereas children seemed to reference the name of the alphabet letter, which says the long vowel sound (e.g., "hope" = HOP; "cake" = KAK).

4. Short vowels were represented by a letter-name whose articulation was close to that of the target sound. (e.g., "pet" = PAT; "will" = WEL; "hit" = HET)). Children used their knowledge of letter names (and thus, long vowel sounds) as a way to categorize and represent short vowel sounds. For example, the short *i* (/ĭ/) and long *e (/ē/)* sounds are similar in place of articulation as both are high-front vowels. Children tacitly categorized /ĭ/ with /ē/and represented the /ĭ/ using the alphabet letter *e*. Read discovered that children used similar vowel substitution strategies for the spellings of short e words (e.g., "met" = MAT) and short o words (e.g., "sock" = SIK).

5. Preconsonantal nasals, which are the nasal sounds (/m/ and /n/) that occur before the consonant in a syllable or word, were consistently omitted (e.g., CAT for "can't," BOP for "bump," and HOGRE for "hungry").

6. Specific consonants (/l/ and /r/) were used to represent entire syllables in multisyllabic words (e.g., *"saddle"* = SADL; "paper" = PAPR).

7. Alveolar flaps (sounds produced by the tip of the tongue touching the upper gum) were spelled the way they are articulated (e.g., *"batter"* = BADR; "better" = BEDR).

Read argued that the observed errors were not random or haphazard. He suggested that children created these spellings using their knowledge of oral and written language. Read (1971, 1975) concluded that young children relied on individual speech sounds, rather than on meaningful units, when spelling words. He argued that the children in his studies used a letter-name strategy where they represented the sounds in words using the names of known letters (i.e., representing the sound /w/ with the letter *y*). From this view, invented spellings represented logical categorizations of speech sounds, where children made attempts to spell similar sounds in the same way (Read, 1986). Emergent readers' logical misspellings were an indication that they brought a tacit knowledge of the sound system to their early attempts to read and spell (Read, 1986). Furthermore, Read observed that children spontaneously refined spellings through experimentation with print and from exposure to conventional spelling. In sum, Read's studies demonstrated that invented spelling reflected children's growing knowledge of the English written language system.

Read's (1975) work highlights the idea that learning to spell is not a function of rote memorization. To this end, Read put forth a new perspective on children's spelling and paved the way for the study of spelling as a developmental process. His contribution challenged the idea that young children's spelling reflected passive learning. Instead, Read's work emphasized that the process of learning to spell was an active, child-centered process in which children spelled words based on their growing knowledge of the English written language system. Children's attempts to invent spellings, rather than to reproduce them, were viewed as valuable and constructive opportunities for learning.

*Henderson and the Virginia Studies of Word Knowledge*

  C. Chomsky (1970, 1979) and Read's (1975, 1986) work provided E. Henderson and his colleagues at the University of Virginia a starting point for conducting a series of studies to describe the trajectory of children's orthographic development. First, E. Henderson and his students collected and analyzed samples of children's attempts at spelling, finding many of the same patterns that Read documented years before (Beers & E. Henderson, 1977; E. Henderson, 1981; E. Henderson & Beers, 1980; Templeton & Bear, 1992). Concerned with how children moved from these invented, creative spellings to conventional, or standard, spellings, their studies took on a longitudinal perspective. More specifically, the Virginia researchers wanted to capture correct and incorrect spellings and document this development across time. Further validating Read's (1975) findings about the systematic nature of pre-school students' early attempts to spell, they concluded that children's spelling errors changed in a predictable, sequential manner as they moved from the concrete features to the more abstract features of our orthography (E. Henderson, 1981; E. Henderson & Beers, 1980). E. Henderson suggested that over time, children internalized and organized information about the written language system and used this knowledge to establish rules about how the system worked. Through the application of these rules in spelling words, children confirmed, contradicted, reevaluated, and refined their phonemic, orthographic, and syntactic knowledge (Beers & E. Henderson, 1977; E. Henderson & Beers, 1980).

  To further describe these findings, the Virginia researchers proposed a series of developmental stages of word knowledge (E. Henderson, 1985; E. Henderson & Templeton, 1986). They suggested that learning to spell was a language learning process, and like the process of acquiring oral language, spelling was also developmental. The predictable,

systematic nature of the English orthography also offered support to the concept of spelling as a developmental process. As children acquired increasingly complex information about the intricacies of the English language, they conceptualized and represented this knowledge in predictable ways.

While the concept of stages can imply rigidity and inflexibility, E. Henderson (1985) argued instead that there were periods in children's language development in which rapid growth occurred, and there were also periods of slower growth focused on applying and refining new word knowledge. Qualitative shifts marked the progression from one stage to the next. The findings of the Virginia researchers led to the identification of four distinct stages through which children progress as they develop knowledge of English orthography (E. Henderson, 1981, 1985; E. Henderson & Beers, 1980; E. Henderson & Templeton, 1986). The stages have since been refined to include five stages that further parse the array of orthographic features that define each period of development (Bear et al., 2012; Scharer & Zutell, 2003; Schlagal, 2001; Templeton & Bear, 1992). The following stages of spelling development are cited extensively in the literature on orthographic development in English.

**Preliterate Stage**. The earliest stage, the *preliterate stage*, involves the representation of meaningful concepts and ideas using scribbles, numbers drawings, letter-like symbols, and letter strings. These early attempts at spelling are not a reflection of letter-sound relationships, as children in the *preliterate stage* do not understand that writing represents speech sounds. Children's spelling at this stage, while random, reflects their desire to create written language (E. Henderson & Templeton, 1986). As young children have experiences with written text, they learn that writing moves from left to right across a page. As children learn about the alphabet and develop knowledge of letter-sound relationships, they may begin

to represent this knowledge in their spellings of words. Although children do not achieve complete letter-sound knowledge in the *preliterate stage,* they may begin to represent initial consonants in their spellings at the end of this stage.

**Letter-Name Stage.** Once children develop an awareness of the initial consonant sounds in words, they have moved into the second stage, known as the *letter-name stage*. A growing awareness of letter-sound relationships allows children in this stage to spell using a phonemic strategy. The *letter-name stage* marks children's ability to use letter names as a cue to the sound they want to represent. Confusion with short vowel sounds is a hallmark characteristic of letter-name spellers. Throughout this stage, children omit sounds in their spellings that they have difficulty separating as individual units. For example, preconsonantal nasals and blends and digraphs are absent through much of this stage. In an attempt to further develop E. Henderson's stages, Bear et al. (2012) further delineated the *letter-name stage* to distinguish between the two phases that children progress through at this stage of spelling development. These researchers separated the *letter-name stage* into the *early letter-name stage* and the *late letter-name stage*.

*Early Letter-Name Stage.* This stage captures children's developing knowledge of the relationships between letters and sounds. Children in this stage attempt to spell the most prominent orthographic features of syllables and words, often using the name of a familiar letter to represent a similar letter sound (i.e., "c" for /s/ and "y" for /w/). At this stage, children often confuse sounds that share the same place of articulation (e.g., /b/ and /p/). In this way, an early letter-name speller may represent the initial sound in the word "bat" using the letter "p." Spelling at this stage evidences a growing awareness of the initial and final sounds of words. For example, an early letter-name speller may represent the /c/ and the /t/

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when spelling the word "cat." By the end of this stage, children's spelling represents logical connections between letters and sounds.

*Late Letter-Name Stage.* This stage focuses on children's growing awareness of the short vowel sound in the middle of syllables and words, as well as more complex sound-based patterns in the English orthography. Throughout this stage, children correctly represent initial and final consonant sounds, and by the end of this stage, they correctly represent the medial vowel in high-frequency short vowel words. For example, at the beginning of the *late letter-name stage*, children may represent the medial vowel in the word "bed" with the letter "a," the vowel most similar to the articulation of short /e/. When spelling words with long vowels (e.g., name, hope, meat), spellers at this stage represent the long vowel sounds using the name of the letter but omit long vowel markers. For example, children may spell the word "name" as NAM using the letter name "a" for the long vowel sound. Throughout this stage, late letter-name spellers develop an awareness of blends, digraphs, and preconsonantal nasals and begin to represent these patterns in their spellings correctly. For example, children can correctly represent the /sh/ digraph in the word "ship," the "st-" blend in the word "stop," and the preconsonantal nasal /m/ in the word "jump."

**Within-Word Stage.** The *within-word stage*, the third stage, is characterized by correct spellings of short vowels, the use of long vowel markers, such as the silent "e" in "home" or the "a" in "team," and the correct spellings of consonant blends, digraphs, and preconsonantal nasals. E. Henderson (1985) suggested that as children acquire a growing number of sight words, they come to understand that spelling does not always represent a one-to-one match between letters. Building on their knowledge of long-vowel spelling patterns, children in this stage acquire knowledge about less common vowel patterns (e.g.,

"ui" in "fruit"; "igh" in "might") and diphthongs (e.g., "oi" in "join"; "ou" in "shout"). One final insight that is acquired in this stage of development is knowledge of more complex consonant patterns, such as the "scr" in "scream" and "dge" in "badge." After students have mastered the basic short and long vowel patterns in one-syllable words, the focus extends to multisyllabic words.

**Syllable Juncture Stage.** The fourth stage, termed the *syllable juncture stage*, involves attention to syllable patterns within and across syllables. Children in this stage build on their knowledge of sound-based patterns in the application of prefixes and suffixes to base words (Schlagal, 2001). For example, children experiment with adding "-ed" or "-ing" to silent-e words, such as changing "name" to NAMEING. In this way, children encounter common juncture issues when they fail to drop the silent "e" (as in the previous example) or in failing to double consonants, as in CLAPING for "clapping."

**Derivational Constancy Stage.** The final and most advanced stage of word knowledge, the *derivational constancies stage*, involves the discovery of connections between derivationally related words that share spelling patterns but differ in pronunciation. This stage is marked by issues with the variations in meaning-based units across common root words and stems. For example, children in this stage learn how to add suffixes to words when the spelling or sound of the base words changes (e.g., "observe" to "observation).

Because this dissertation addresses the development of children in the early grades, the fourth and fifth stages of spelling development are not the primary focus. Ultimately, these stages offer a long-range view of the developmental shifts through which students progress as they become proficient in using such a layered orthography.

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*A Summary of Spelling Development*

Careful attention to the predictable nature of children's spelling errors allowed researchers to sequence the features of the English spelling system according to the order in which most children acquire them (E. Henderson, 1985; E. Henderson & Templeton, 1986). When provided appropriate instruction and opportunities for practice, children typically attend to the alphabetic layer of the English orthography first. They develop knowledge of beginning consonant sounds, ending consonant sounds, short vowels, consonant blends and digraphs, and preconsonantal nasal sounds. Building on the knowledge of letter-sound relationships, children begin to understand the patterning of words, known as the syllabic layer. This includes vowel patterns in single syllable words as well as patterns within multisyllabic words. Children now have a strong foundation of the prerequisite knowledge of the alphabetic layer that they can attach to new knowledge of common long-vowel patterns (hope, rain, time), less frequent long-vowel patterns (wild, new), r-controlled vowels (her, car), complex consonant clusters (strip, throw, edge, itch) and ambiguous vowel sounds (shout, caught). The last level of classification is focused on word parts that hold meaning. Once children have acquired knowledge of alphabetic and syllabic layers, they are equipped to make sense of the morphemic layer. This layer consists of the meaning-making units of our written language system, which includes prefixes, suffixes, Greek roots, Latin stems, and advanced derivational changes.

This ordering and classification of the spelling system's complexities reflects a historical understanding of the English language and the multitude of studies documenting young children's invented spellings. The stage development theory of spelling put forth the idea that children do not just learn individual spellings of words; instead, children progress

through broad stages of spelling knowledge that depict an evolving understanding of the features and rules that govern our written language system. From this view, spelling is a developmental process that hinges on an increasingly sophisticated understanding of the written language system that extends beyond simple letter-sound relationships. Some studies have replicated the series of advancements within and across stages with various diverse populations (see Invernizzi & Hayes, 2004). The developmental sequence first outlined by E. Henderson and his colleagues (and later refined by Bear et al. [2012]) provides a way for teachers to understand qualitative changes in children's spelling over time.

**The Development of Word Recognition Skill**

Routine as it may seem, each instance of word recognition is a fantastic feat. It begins with a pattern of light and dark cast onto the retina by reflection from the printed page; for the skilled reader, it ends less than a quarter of a second later and almost always with the correct word. In this time, the reader must find the word's meaning in memory, for only there is word form associated with meaning; he must locate a single item in a mental lexicon containing tens of thousands of entries. (Gough, 1984, p. 225)

Gough's (1984) description of the complexities involved in recognizing a single word in print paints a picture of a process that operates much like a well-oiled machine. However, considerable background knowledge is requisite to this kind of facility in reading words – a skill known as automatic word recognition. LaBerge and Samuels (1974) outlined three levels of achievement that define the skilled recognition of words: (1) Readers can accurately and consistently read words as they recur across texts; (2) Readers can read words automatically, without devoting conscious attention to processing their parts; (3) Readers can

read words rapidly, whereas they locate the correct word in memory at sight. The question of what kind of information readers need to enable the automatic recognition of words is one that many researchers have wrestled with over the last half of a century (see Adams, 1990; Ehri, 1987, 1980, 1998; Perfetti, 1985; Share, 1995). In doing so, they made great strides in our understanding of how skilled readers acquire such automaticity.

For skilled readers, words rather than letters or sentences, are the activated unit when translating print to speech (Ehri, 1991, 1994; Rayner & Pollatsek, 1989). Ehri (1994) described the importance of the word-level unit as a function of the efficiency that the unit offers to the overall reading process. Almost 75 years ago, Cattell (1947) used a specialized device called a tachistoscope to measure the speed at which readers recognize words. He discovered that skilled readers recognized whole words as quickly as they did individual letters and that they named a word faster than a letter. Learning to read words with some degree of ease would then seem to be a productive goal for beginning readers. As the beginning reader's decoding skills improve and more words are recognized by sight, less mental energy is needed to decode words and more mental energy can be used to create meaning from the text (LaBerge & Samuels, 1974).

For readers at the earliest levels, word recognition is a laborious process requiring a great deal of cognitive attention (Perfetti, 1985). For skilled readers, however, recognizing words seems almost instinctual (Adams & Bruck, 1993). This apparent ease belies the nature of acquiring written language. It is not a natural process, and readers must learn a great deal about the orthographic system and refine this knowledge over time (Liberman, 1992). In other words, beginning readers must develop a deep and functional understanding of orthography, as well as the sound system that it represents. This deep knowledge of the

connections between symbols and sounds can provide children with the tools needed to begin processing written language. The orchestration of these processes becomes routine through practice applying this knowledge during experiences with written text (Adams, 1990; E. Henderson, 1981; Share, 1995).

### *Reading Words*

Reading words requires readers to utilize information stored in their lexicons – which is a collection of known words held in long-term memory, much like a mental filing cabinet. The data stored in readers' lexicons are not merely words themselves, but rather, a constellation of information about word pronunciations, spellings, meanings, and syntax (Ehri, 1980, 1998; Perfetti, 1985). Readers activate this information through lexical access, which is the process through which words that have previously been encountered are read by sight (Ehri, 1992a). Ehri (1998) described this process as one in which readers' mental filing cabinets connect to their eyes so that when their eyes touch on words stored in their lexicons, all known information about the word activates instantaneously without conscious attention to the task itself. This phenomenon can be highlighted by what has become known as the "Stroop effect" (Posner & Snyder, 1975, p. 56; Stroop, 1935), which demonstrates that much of information processing happens automatically (see Stanovich, et al., 1981 & West & Stanovich, 1979 for discussions of Stroop's findings in the context of automatic processes involved in word reading).

The Stroop test (Stroop, 1935) presents an array of color words (i.e., blue, green, red) printed in a font color different than the word itself (e.g., the word *blue* is shown in the color red) and participants are asked to name the color of the word. A skilled reader is unable to sustain an accurate identification of the color of the word when presented with meaningful

written text. J. D. Cohen et al. (1990), using the Stroop test, found that automaticity depends on the strength of the processing pathway and that this strength increases through practice. Put another way, once a processing pathway is sufficiently strong and words are recognized on sight, word recognition becomes difficult to inhibit.

Ehri (1991, 1994) described three strategies that readers use when reading words that are not yet automatic, or known by sight. Words can be read by decoding, which requires readers to apply knowledge of letter-sound relationships to translate spellings of words into speech, and then to search their lexicons for a word that matches in meaning and pronunciation. At the earliest levels, decoding operates on a letter-by-letter, sound-by-sound basis, but the more advanced form utilizes familiar spelling patterns within words. While decoding enables readers to read unfamiliar words, it is a slow and inefficient strategy for reading words. Readers may also read unknown words by analogy. Using this strategy, readers compare the spelling patterns of unfamiliar words to the patterns of known words stored in their lexicon. Perhaps the least efficient way to read words is through contextual guessing, where readers use context clues to make sense of the unfamiliar word. While using context may seem like a productive strategy for reading words, some words are easier to guess than others. Content words, which are the words that carry the bulk of a text's meaning, can only be predicted about ten percent of the time (Gough, 1983). Knowledge of sound-spelling relationships must be used to decode these words.

In sum, reading words through lexical access is the most efficient and automatic way to read words (Ehri, 1995, 1998; LaBerge & Samuels, 1974). Unlike the strategies for reading unfamiliar words, the automatic recognition of words is an unconscious process (Ehri, 1998). It is important to restate that the automatic recognition of words is not a

conscious decision; instead, it is an automatized activation of word representations in the lexicon. When readers access words from memory, they activate information stored from previous encounters with words. Activation of a word by sight renders the other strategies useless – readers do not need to employ word-reading strategies when a word is recognized by sight.

*Early Theories on Word Recognition Development*

Adapted from earlier models of reading development (see Marsh et al., 1981), Frith (1985) put forth a three-phase theory of reading acquisition. The phases in Frith's (1985) model represent distinct approaches that readers employ when identifying words. In Frith's first phase, termed the *logographic phase*, children recognize words using visual features. Orthographic and phonological information is not a factor in word recognition at this point in development. The second phase, the *alphabetic phase*, entails the use of letter-sound knowledge to sound out words from left to right. By the third phase, the *orthographic phase*, Frith proposed that beginning readers recognize new words automatically by attending to the word's orthographic patterns and matching them with words stored in their lexicons.

In 1988, Stuart and Coltheart investigated the development of word recognition in young British children who were in the earliest phases of learning to read and challenged Frith's (1985) three-phase theory. Their main critique was with Frith's rigid conceptualization of beginning readers' use of phonological and alphabetic knowledge in reading words. Stuart and Coltheart (1988) argued that beginning readers use any available forms of this knowledge when they attempt to read words. From their perspective, the logographic strategy is likely a backup strategy for when readers do not possess enough letter-sound knowledge to attempt decoding the word. Instead, they hypothesized children

might first recognize only the initial consonant sounds of a word, then the initial and final consonant sounds, followed by recognition of all sounds, including the vowel (T--, T-P, TOP). One significant contribution of their research was the theory that word recognition does not progress through sequential decoding as Frith described and may be more adequately conceptualized as the construction of partial units in words over time (i.e., initial sounds, final sounds, and then medial vowel sounds).

*Ehri's (1998) Phases of Development in Learning to Read Words*

Influenced by the work of Frith (1985) and Stuart and Coltheart (1988), theories of spelling development (E. Henderson & Beers, 1980), and findings from her own research, Ehri (1991, 1994, 1995) conceptualized a trajectory of word recognition development for beginning readers. She defined four phases of development through which readers progress. Ehri proposed that readers must intuit the regularities and irregularities within the orthography if sight words are to be encoded in lexicons.

**Pre-Alphabetic Phase.** Similar to Frith's (1985) *logographic phase*, the first phase of Ehri's model depicts beginning readers' awareness of the visual cues in words, with little or no attention to the letter-sound relationships. Throughout this phase, children read words using memory for a word's visual cues and its pronunciation and meaning. For example, imagining two eyes in the middle of the word "look," or recognizing the McDonald's sign by the golden arches, rather than by the sound of the letter "m," are examples of visual cues that prompt children to recall words they have seen before. Young children's desire to recognize words assists them in acquiring this very primitive form of word learning. While readers easily recognize some words, visually similar words may be indistinguishable. Without an awareness of letter-sound relationships, "look" and "book" may be read as the same word

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because they offer similar visual cues. It is important to note that at this phase of word learning, the lack of connections between letter-sound relationships prohibits readers from storing words in their lexicons.

**Partial Alphabetic Phase.** In this second phase of Ehri's (1998) model, the *pre-alphabetic phase*, readers begin to establish connections between letters and their corresponding sounds. The application of this knowledge as they begin to read words contributes to their growing word knowledge in memory – a development that will be important for building the capacity to eventually read words by sight. In addition to letter-sound knowledge, the developing ability to segment the initial and final phonemes in spoken words is necessary to move into this phase. For example, the word "like" may be remembered by matching the beginning and ending sounds to their letters ("l" and "k"). Each time the reader encounters a word in print, they activate the partial information stored in their lexicons, becoming more efficient each time they read it. Compared to the earlier phase, the formation of partial alphabetic cues hinges on the learning of letter-sound relationships; however, the alphabetic knowledge utilized in this phase is incomplete.

**Full Alphabetic Phase.** Advancing to the *full alphabetic phase* requires the formation of complete connections between letters and their corresponding sounds – an insight that enables readers to commit words to memory. Ehri (1998) refers to this process of applying orthographic knowledge to pronunciations and meanings of words as an amalgamation of the word's spelling in memory. Put another way, readers assimilate knowledge of the letter-sound relationships existing within a given word and attach it to the word's spelling, pronunciation, and meaning to create the word amalgams in lexicons. Information about a given word is stored cohesively in the lexicon awaiting a subsequent

encounter in which the word activates more efficiently. For example, when reading the word "truck," readers in this phase recognize that the five letters match to four phonemes in the word, including how the ending /k/ sound corresponds to two letters, "c" and "k." At this phase of word development, there is little confusion between similarly spelled words because of the robust connections that allow the word to be stored more completely in memory. Words established in readers' lexicons as sight words can now be read quickly and with ease. Additionally, readers can use this growing sight vocabulary to read new words by analogy.

**Consolidated Alphabetic Phase.** In Ehri's (1998) final phase, the *consolidated alphabetic phase*, readers recognize orthographic patterns that are shared across words. For example, a reader in this phase whose sight words include "weigh," "eight," "neigh," and "freight," can likely identify a new word, "sleigh," with the familiar unit "eigh," without instruction or letter-by-letter decoding. The consolidation of recurring letter units allows readers to process words more efficiently by chunking, rather than decoding each individual letter. These units include onsets and rimes, syllables, and common affixes. Ehri described this phase as one in which connection-forming processes are abundant because of a reduced memory load for both recognition and storage of words in memory. By this stage, readers are able to read most words encountered by sight.

*Lexical Representations and Automaticity*

Concurrent with Ehri's work, Perfetti (1985, 1992) investigated the ways in which readers access and modify word representations. According to Perfetti (1985), "the most important property of a word identification system is the quality of the word representation" (p. 19). In other words, it is not merely the number of words stored in the lexicon that leads to proficiency in reading, but the degree to which these words are readily available and

efficiently accessed during encounters with text. As stated previously, lexical access refers to the retrieval of words stored in long-term memory. Perfetti (1985) identified lexical access as the "recurring part of reading" (p. 20) highlighting the importance of word recognition development for all readers, both beginning and skilled. Furthermore, he posited that lexical access is the result of interactive processes used to retrieve a word from long-term memory.

Retrieving words from the lexicon begins with the input of visual stimuli. Skilled readers subconsciously process all the letters in a word and the whole word is recognized instantaneously. In this way, knowledge of letters, orthographic features, pronunciation, syntax, and meaning are simultaneously activated in the lexicon to allow for the automatic recognition of words (Adams, 1990; Perfetti, 1985; Rayner & Pollatsek, 1989). Activation of a word is simultaneously a bottom-up process, where letters serve as triggers, and a top-down process, where prior expectations and predictions prime the readers' expectations for specific meanings and pronunciations. In most reading situations, it is the bottom-up processes that exert the most influence on readers' abilities to activate a word's representation in long-term memory (Perfetti, 1985). The top-down processes may be most beneficial when the quality of a word's representation is inadequate. However, with experience and repeated exposure to words, the representation of the word grows (Adams, 1990; Perfetti, 1985, 1992). The representation increases in quality and allows for faster activation of the word's meaning and pronunciation. In sum, with experience, readers become more efficient at activating and retrieving words from their lexicons, primarily through the bottom-up processes (Perfetti, 1985).

Perfetti acknowledged that decoding and sight word learning contribute to the storage of more words in readers' lexicons. However, decoding is limited in what it offers beyond

providing the matches between letters and sounds that are activated when reading a word; these connections lose their power as words become more familiar (Perfetti, 1992). Each successful encounter with a word allows the addition of new phonological, orthographic, syntactic, and semantic information to the word's lexical entry. Perfetti (1992) hypothesized that the gradual increasing sophistication of representations enables the efficient and automatic retrieval of words from the lexicon.

The efficiency in reading words that is central to both Ehri's (1998) and Perfetti's (1985, 1992) theories of word recognition development is rooted in a theory of automatic information processing. Huey (1908/1968) first acknowledged the pivotal role of automaticity in word recognition by recognizing that beginning readers required time to attend to the details to process unfamiliar words, but, with successive encounters with the same words, reading became increasingly more automatic. LaBerge and Samuels (1974) revitalized Huey's hypothesis on the development of automatic word recognition more than 50 years later. According to these researchers, beginning readers first acquire accuracy in reading words, followed by increasing automaticity (LaBerge & Samuels, 1974). A reader must first read a word accurately before they can read it with any degree of automaticity or ease. In sum, the processing of individual letters, sounds, and words is a cognitively taxing engagement; automaticity in reading words allows for attentional resources to be allocated for comprehension processes, which is critical since the goal of reading is to construct meaning from print as discussed at the beginning of this chapter.

### Share's (1995) Self-Teaching Hypothesis

In 1995, Share proposed his "self-teaching hypothesis" (p. 151). He suggested that the sophisticated orthographic representations central to accurate and automatic word

recognition are mostly self-taught through reading experiences. From this perspective, phonological recoding, or the ability to translate printed letter strings to their spoken forms, functions as a self-teaching mechanism. As soon as a child has some orthographic knowledge and can read simple texts, the self-teaching mechanism can be activated. For example, consider a first grader encountering the following sentence in a book: "The dog wants the ball." Armed with a handful of sight words, some phonemic awareness, and a rudimentary understanding of decoding, the child might anticipate the spelling of the unknown word "ball" as follows: BOL. However, the child recognizes that the vowel sound in this word is not represented by the letter "o," but by the letter "a." Applying their letter-sound knowledge, the student has an opportunity to either confirm or reevaluate their existing match between the letters and sounds in the word. It is this realization that allows the student to self-teach, or process, and store in memory, a more correct spelling of the word. Although the student has not yet recognized that this word utilizes double consonants at the end, successive encounters with "ball," or other words like it (e.g., doll, tell, full), will offer further opportunities for self-teaching to occur. It is these successful attempts at decoding unfamiliar words and patterns that allows the storing of accurate representations in memory.

Share (1995) identified three features central to the self-teaching mechanism. First, orthographic and phonological processes are activated through self-teaching, each making their contribution. Second, self-teaching occurs on a word-by-word basis, where the frequency of encountering a given word, and success with reading it, are the contributing factors to automatically recognizing that word. When readers encounter a familiar word, they read it automatically; when the word is unfamiliar, they phonologically recode it through self-teaching. Third, as orthographic and phonological knowledge grows over time, so, too,

does the self-teaching mechanism. Beginning readers employ self-teaching with only a simple understanding of letter-sound relationships. As they establish a more complete knowledge of orthography and the way it maps to spoken words, self-teaching becomes a more sophisticated, "lexicalized" process, extending beyond the simple letter to sound matches.

### A Summary of Word Recognition Development

For beginning readers, increases in word recognition correlate with growth in reading skill (Ehri, 1994, 1995, 1998; Perfetti, 1985, 1992). The sight word reading that Ehri (1998, 2005) described in her phases of development is contingent on readers' ability to access known words in the lexicon, a complex process that Perfetti (1985, 1992) outlined in detail. There is agreement that learning to read requires that beginning readers acquire an increasing number of word representations and that these representations gradually strengthen over time (Ehri, 1998; Perfetti 1992). Further, both researchers agreed that the ability to read words by sight, a result of full and robust lexical representations, drives the reading process forward.

Aligning with the work of LaBerge and Samuels (1974), Ehri and Perfetti confirmed that the role of automaticity is fundamental. As word representations become more robust, Share's (1995) self-teaching hypothesis accounts for related increases in automaticity. However, from Share's perspective, growth in word-recognition is an item-based, not phase-based process. Though models differ, the central role of word recognition in the reading process is uncontested.

### The Relationship Between Spelling and Word Recognition

In her seminal text, *Beginning to Read: Thinking and Learning about Print*, Adams (1990), summarized and interpreted years of research on beginning reading. In doing so, she

identified three core processes that operate together when individuals are reading words (see

Figure 1). Each part of Adams's model represents a particular type of knowledge contained

in a word's representation: (a) orthographic information, or knowledge of written letters and

patterns, (b) phonological information, the understanding of sounds and pronunciations, and

(c) meaning information, or vocabulary knowledge. The fourth component of the process is

the context processor, which constructs the meaning of the text using semantic and linguistic

information. Each of the processors builds on much simpler units of information that

integrate through experiences with words.

**Figure 1**

*Adams's (1990) Four-Part Processor*
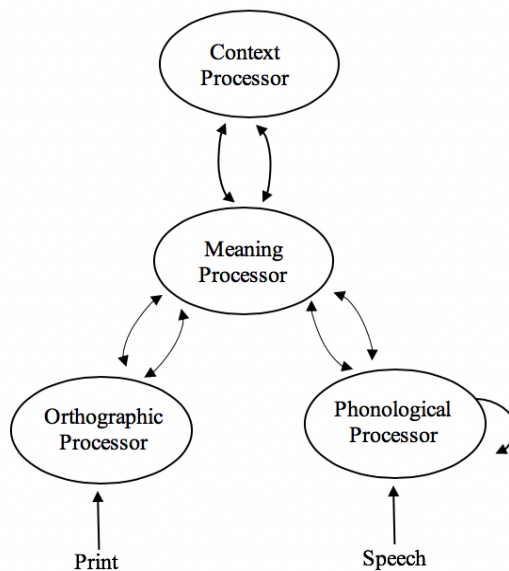


*Note.* From *Beginning to read: Thinking and learning about print* by M. J. Adams,

p. 158. Copyright 1990 by the MIT Press.

Recognizing printed words requires readers to notice their spellings, their sounds, their meanings, and the relations between them (Adams, 1990; 1994). The highly interactive nature of the relationships between these processors allows effortless and meaningful reading to occur (Adams, 1990). Each processor independently exercises its functions, while also integrating with input from the other processors. Consider, for example, a car driving in the snow. If one has the necessary mechanisms, four-wheel drive activates and takes over, allowing the vehicle to proceed safely through the terrain. The car has not deactivated its other systems for the four-wheel drive to operate; the systems work together for a common purpose – to maneuver the car safely through the snow. Adams (1990, 1994) was careful to caution that, although functionally different, the parts of the reading system are not independent processes. Adams (1994) described the nature of the relationship between the processors:

> We cannot proceed by completing each one in isolation and then fastening it
> to another. Rather, the parts of the reading system must grow together. They
> must grow to and from one another. For the connections and even the
> connected parts to develop properly, they must be linked in the very course of
> acquisition. (p. 840)

In other words, Adams's (1990) model does not reflect three separate parts that develop for reading to occur; instead, it represents how each of these parts becomes intimately connected to the others through experience. These associations between the orthographic, phonological, meaning, and context processors leads to fluent, skillful reading (Adams, 1994).

### *The Orthographic Processor*

Skilled readers process virtually every letter of every word during meaningful reading experiences, yet they process words as complete units. The orthographic processor in Adams's (1990) model represents the visual knowledge of letters, spelling patterns, and words. In essence, this processor serves to activate readers' orthographic knowledge through the visual stimulation of printed words. The visual input of print, specifically the individual letters within the words, is what activates the orthographic processor, and thereby starts the reading process.

For skilled readers, the strength of orthographic units in long-term memory allows for all the letters and patterns within a word to be recognized immediately and simultaneously, which allows for automatic recognition of whole words. An example helps illustrate this process. Suppose a skilled reader comes to the word "and" in a line of text. Because this word is familiar and frequently occurring, its three letters are likely stored together as a single unit in the reader's lexicon, where it readily awaits activation. The strength of the connections between the letters, which is a result of many successful encounters recognizing this particular orthographic unit, and the frequency of seeing its printed form, allows the reader to automatically and accurately read the word. The reader is then able to move on to the next word in the sentence without pause or conscious effort.

By way of strong associations between letters, the orthographic processor also enables two other functions: (a) processing letter order within a pattern or word; and (b) breaking words into syllables. Skilled readers have developed strong associations between letters and can identify sequences that are both likely and unlikely. For example, skilled readers recognize that the letter strings "srj" and "qma" are not likely to occur in the English

language. Strong associations between letters also equip skilled readers to break multisyllabic words into syllables, as opposed to decoding letter by letter, thereby allowing the word to be processed more efficiently. For example, a skilled reader can efficiently process the word *amazement* by breaking it into two parts. However, beginning readers need experiences with written text and opportunities to learn about the patterns in English orthography to strengthen these associations.

### The Meaning Processor and the Context Processor

Creating meaning from written text depends on word-level processes to be effortless and automatic (Adams, 1990). Additionally, the orthographic processor acts in concert with the meaning processor and the context processor. As visual input stimulates recognition of the word, it also stimulates the meaning processor. These processors send the word's information to and from one another until they reach an agreement on the word and its meaning. At the same time, the meaning processor is also communicating in two directions with the context processor as it orchestrates the critical, ongoing work of maintaining a coherent interpretation of the text. The context processor awaits confirmation about the meanings of individual words from the meaning processor. Each processor must simultaneously complete their own identified job while also contributing to the overall function of the entire system.

### The Phonological Processor

In the same reciprocal fashion, the phonological processor awaits the input of visual information about a word through the orthographic processor. As this information processes, appropriate phonological units activate through the phonological processor, which then sends confirmatory information back to the orthographic processor. This component of the system

also communicates with the meaning processor. Simultaneously, the activation of a word's meaning stimulates information about its pronunciation, and the activation of its pronunciation through the phonological processor stimulates its meaning.

In addition to interacting with the orthographic and meaning processors, the phonological processor has two other characteristics that define its role in the reading process. In the same way that the orthographic processor receives information from visual stimuli, the phonological processor takes in auditory stimuli in the form of speech. Unlike the other processors, the information inherent to the phonological processor can be activated freely by readers. To this end, readers speak, subvocalize, and create images of speech as they wish. Beyond interacting with the other processors, the value of the phonological processor is in the capabilities it offers to the overall reading system. One crucial function it brings to the larger system is an increase in the accuracy and automaticity for processing the orthographic information and meanings of less familiar words. In this way, it provides redundancy in processing, serving as insurance to the alphabetic system (Adams, 1990).

The three processors of Adams's (1990) model illustrate the interaction for skilled readers. The interconnectedness of the orthographic, meaning, and phonological processors enables automatic word recognition (Adams, 1994). All three processors support the others both when they are consistent in their input and when they are inconsistent. This is especially true for beginning readers when the orchestration between processors is less efficient due to a lack of underlying knowledge that supports the proper functioning of individual processors.

### *Aligning Reading and Spelling Development*

In Adams's (1990) conceptualization of the reading process, skilled reading is dependent on knowledge of the English written language system, including letter-sound

correspondences, and spelling patterns. However, this orthographic knowledge is not enough for the reading process to fully develop. Skilled reading also requires that this information connects with information about word pronunciations, syntax, and meaning. As readers grow, they store an increasing number of word representations in their lexicons, enabling them to recognize words more efficiently. This automatic recognition of words is what drives the reading process forward. Together, this knowledge creates an environment in which reading and spelling can develop in a reciprocal, mutually supportive manner.

At the earliest level of spelling and reading skill, children apply pre-alphabetic knowledge, or information unrelated to the alphabetic system. E. Henderson (1985) referred to this period of development in spelling as the *preliterate stage*, while Ehri (1998) termed this period of development in word recognition as *pre-alphabetic*. The second and third levels of Ehri's (1998) model, the *partial alphabetic* and *full alphabetic phases,* are periods in which beginners bring increasingly more complete understandings of the alphabetic system to reading and spelling words. In E. Henderson's (1985) model of spelling development, the *letter-name* and *within-word* stages also reference orthographic knowledge that becomes more complete over time. The final levels in these two models, Ehri's (1998) *consolidated alphabetic* and E. Henderson's (1985) *syllable juncture* and *derivational constancies* stages, are characterized by the skillfulness with which sophisticated knowledge of orthographic patterns and meaning-based units (i.e., roots, prefixes, and suffixes) are used to read and spell words. These developmental models provide a framework for understanding how knowledge of the alphabetic system differs across skill levels for reading and spelling development. Theoretically, children who have a limited, or partial-alphabetic understanding as represented by their spellings, are thought to bring the same incomplete knowledge to

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reading tasks. Likewise, children use the sophisticated word knowledge represented in their spellings of words to read words of the same orthographic complexity.

Before these researchers put forth the aforementioned developmental models, other researchers argued that word recognition and spelling were independent processes (Barron, 1980; Bryant & Bradley, 1980; Frith, 1980; Gibson & Levin, 1975; L. Henderson & Chard, 1980; Smith, 1973). The accepted view during this period was that language production (i.e., spelling) was cognitively more challenging than language reception (i.e., reading) and that these processes operated from two separate knowledge bases (Gill, 1992). Many (Ehri & Wilce, 1987; Gill, 1992; Juel et al., 1986; Morris & Perney, 1984; Stuart & Coltheart, 1988) challenged this view and found evidence to support the conceptualization of word recognition and spelling as reflections of a shared underlying word knowledge.

Morris et al. (2003; also see Morris, 1993) attempted to connect theories of reading and spelling development in a model of early reading. Their model captures the stages through which beginning readers progress as they apply their developing alphabetic knowledge (Morris et al., 2003). In the earliest level of Morris et al.'s model, beginning readers direct their attention to the beginning consonant in words (e.g., B - - for "bat"). With the advent of the concept of word, or the perception of individual words in written text, beginning readers establish word boundaries using the beginning and ending consonants in a word (e.g., B - T for "bat"). Through successive experiences reading and spelling words, readers approach a level of phoneme segmentation ability, where they perceive all the sounds in a word (e.g., B-A-T for "bat"). The final stage of this model reflects beginning readers' ability to recognize words with some degree of automaticity.

In a meta-analysis of empirical studies investigating reading and spelling, Ehri (1997) argued that children acquire word-specific information through learning to read and store this information in the lexicon, where it is then available to support spelling. She found that practice in reading words influenced students' spellings and that instruction that improves overall knowledge of the writing system through reading also benefits spelling (Ehri, 1980, 1997; Ehri & Roberts, 1979; Ehri & Wilce, 1987). Ehri (1997) argued, "If students have partial letter information about specific words in memory, they do not ignore this knowledge and invent a spelling; rather they access the letters they remember and invent the part they do not remember" (p. 258).

While these conclusions offer important implications for conceptualizing how reading words influences spelling development, the relationship between the two may not be unidirectional. In a study of first graders, Morris and Perney (1984) tested children's ability to invent spellings of words before beginning formal reading instruction. These researchers found that children's invented spellings, which reflect their understanding of the spelling system, determined the ease with which they made progress in learning to read. Ehri (1987) also found that for beginning readers, learning to spell words influenced their ability to read words. Taken together, these researchers' findings suggest the likelihood that reading and spelling skill are manifestations of the same underlying knowledge of the alphabetic system.

Perfetti et al. (1987) investigated the relationship between phonemic knowledge and learning to read among first graders. The findings from their research indicated that the relationship between these two skills is reciprocal and mutually supportive. Further, Perfetti et al. (1987) speculated that there are two levels of phonemic knowledge. The first type they described is a primitive, surface-level phonemic knowledge that does not allow for the

reciprocal development of reading and spelling skill. The second type is analytic, in which

phonemic knowledge embeds deeply in the lexicon. The acquisition of this analytic type of

phonemic knowledge depends on meaningful experiences with words (Perfetti et al., 1987).

Based on their hypothesis, it seems possible that analytic phonemic knowledge may play a

role in the reciprocal development of reading and spelling skill.

*A Summary of the Relationship Between Spelling and Reading Development*

Learning to associate word spellings with meaning and pronunciation is an essential

first step for beginning readers, but they must continuously refine and strengthen their

understandings in order to make word recognition automatic (Adams, 1990; Perfetti, 1985;

Pikulski & Chard, 2005). For beginning readers, who lack a volume of strong word

representations, it is the repeated exposure to orthographic and phonological information that

grows the lexicon (Ehri, 1998, 2005; Perfetti, 1985). When children generate invented

spellings, they must actively consider the letter-sound connections and reflect on their

relationship to written words (Adams & Bruck, 1993; Morris & Perney, 1984). Developing

skill in reading and spelling words depends on orthographic representations of printed word

forms (Ehri, 1992b, 1998; Perfetti, 1985). These lexical representations are an amalgamation

of information about spelling, pronunciation, and meaning (Ehri, 1992b). The richness of

readers' representations determines the ease with which they can recognize and spell words

(Perfetti, 1985). To acquire and strengthen these representations, meaningful experiences

with words must be plentiful (E. Henderson, 1981, 1992; Adams, 1990). Although these

researchers came from different disciplines and went about their research on beginning

reading and spelling in different contexts (i.e., E. Henderson from reading education, Ehri,

Perfetti, and Adams from experimental psychology), their findings were the same. As

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beginning readers grow in their knowledge of written words, they store this information in their minds, where it is available for retrieval for reading and spelling words.

If E. Henderson (1981) is correct in his belief that reading experience directly facilitates the development of word knowledge, then the question of instruction is of central importance. How can we ensure that word knowledge has the opportunity to flourish in children in the early grades? Word recognition and spelling development are not likely to progress spontaneously; instruction and experiences with words influences skill in these areas (E. Henderson, 1981; Morris et al., 2003; Spear-Swerling, 2015). With this in mind, the final part of this review of the literature addresses the question of how phonics instruction influences the development of early reading and spelling skill. The next section provides an overview of the context of this study given that the spelling and word recognition theories that undergird this research were developed before phonics instruction became the prevailing methods of teaching young children to read in first grade.

**Phonics Instruction in the Early Grades**

The report of the National Reading Panel (NRP, 2000), described in the first chapter of this dissertation, presented evidence of a relationship between reading and spelling. The NRP's findings indicated that the same phonics instruction that resulted in growth in reading skill also produced an increase in spelling skill for children in kindergarten and first grade. Thus, the rationale for incorporating explicit, systematic phonics instruction in the early grades inherently offered support for a reciprocal relationship between reading and spelling development.

While the NRP report did not find sufficient evidence to support implementing one type of phonics instruction over another (i.e., analytic programs, which involve analyzing the

sounds to deduce individual units of sounds, versus synthetic programs, which teach each letter sound explicitly and separately from word reading) they endorsed a single approach to teaching phonics – systematic instruction. The term *systematic*, as defined by the NRP, refers to a specified, sequential approach to teaching phonics elements taught with varying degrees of explicitness. In contrast, systematic instruction is the opposite of incidental phonics instruction, in which phonics elements are taught as they are encountered in a text (NRP, 2000). In their research tracing the emergence of the *explicit* and *systematic* terminology used to describe phonics instruction, Mesmer and Griffith (2005) identified three characteristics of phonics instruction that follows this approach. First, they found that such instruction is *systematic*, in that the curriculum builds over a period and phonics elements are introduced in a specified order. Second, the instruction is explicit in the sense that the teacher directly identifies what it is they are attempting to teach. Third, instruction that is both systematic and explicit involves engaging children in opportunities to practice using phonics knowledge to read words.

Over the past twenty years, the practice of adopting reading programs with a scripted curriculum has emerged across the United States. Such programs are believed to include components of reading identified as "research-based" (Shanahan, 2002), an idea that has since been extended to include what some refer to as the "science of reading" (Walsh et al., 2006). Today, many teachers in classrooms across the country implement scripted explicit, systematic phonics programs. The publishers of one such program, Letterland (Wendon, 2014), reported that it is in use in over 44 states, including North Carolina where Letterland is used in more than 80% of all school districts (Keys to Literacy, n.d.). Commercial phonics programs often provide scripted lesson plans, detailed and sequenced to assure the inclusion

of "research-based" components (McIntyre et al., 2008). Although the time spent on phonics instruction lacks systematic investigation in the last decade, an impact study of the Reading First program, which was a federal literacy initiative inspired by the NRP report, indicated that more time was spent on phonics instruction in first-grade classrooms than on the other components of reading instruction that the NRP also found to be effective (NCEE, 2008). That is, phonics instruction seemed to overshadow the other components recommended in the NRP report (*i.e.,* fluency, vocabulary, comprehension, writing).

Research conducted within the last 20 years reveals evidence to support that systematic phonics instruction does result in reading gains for children in the early grades (Blachman et al., 2004; Denton et al., 2006; Pullen et al., 2005; Ryder et al., 2008). A number of studies published since the NRP report have compared the relative effectiveness of different approaches (i.e., synthetic versus analytic) to phonics instruction for beginning readers (Christensen & Bowey, 2005; Di Stasio et al., 2012; Johnston et al., 2012; Johnston & Watson, 2004; Kyle et al., 2013; Rightmyer et al., 2006; Savage et al., 2009; Walton et al., 2001). Collectively, these studies were inconclusive regarding the most effective method for teaching phonics, suggesting that the current emphasis on synthetic phonics instruction, as opposed to other methods, may not be necessary for all children.

A smaller number of researchers have investigated the influence of phonics instruction on various aspects of children's early literacy skill, but these studies only begin to address the role of phonics in beginning reading development (McGeown et al., 2012; McGeown & Medford, 2014; McIntyre et al., 2006; Rightmyer et al., 2006; Sonnenschein et al., 2010). The dearth of literature on this topic presents gaps in our understanding of how different approaches to phonics instruction influence early reading and spelling skill. For

example, no study published in the last 20 years has addressed the contextual reading skill of students who received synthetic phonics instruction in the short-term or later grades. Additionally, no study addressed spelling directly or indirectly when investigating the influence of phonics instruction. While there is sufficient evidence establishing the critical role of phonics instruction for beginning readers, we know little about the influence of the phonics methods currently implemented in early elementary classrooms across the United States, specifically as they influence the development of reading and spelling skill. To this end, this study systematically investigated the development of reading and spelling skill in first-grade students receiving explicit, systematic phonics instruction.

**Chapter Three**

**Methods**

In light of the instructional shifts (NRP, 2000) since the spelling and word recognition theories were put forth and the renewed attention on the critical importance of explicit, systematic phonics instruction in teaching children to read, understanding the development of early literacy skills in this instructional context is a timely issue (Calkins, 2019; Castles et al., 2018; Hanford, 2018a, 2018b, 2019a, 2019b; International Literacy Association, 2018, 2019a, 2019b; National Council for Teachers of English, 2019; Reading Recovery Council of North America, 2019; Seidenberg, 2019; Treiman, 2018). This dissertation examined the spelling and reading development of 89 first graders in an instructional context that includes explicit, systematic phonics instruction. As such, this dissertation addressed the following research question: How do reading and spelling develop in first graders receiving a minimum of 40 minutes daily mandated phonics curriculum?

This longitudinal study measured the development of word recognition, oral contextual reading, and spelling for first graders in classrooms that used an explicit, systematic program to teach phonics. First, the participants and setting for the study are described. Next, the procedures for data collection and the measures used are outlined. The final section explains the method of data analysis.

**Participants**

The participants were 89 first-grade students from six classrooms across five public elementary schools in a rural county in western North Carolina. The classrooms from which the participants were drawn were classrooms in which the use of an explicit, systematic phonics program was mandated by the school district. All first-grade teachers in the county were invited to participate in this study and six teachers volunteered to participate in this

study. The six participating classrooms were a random sample from the population of first-grade teachers in the county ($N = 20$). The teacher participants represented a range of teaching experience from two to 35 years in the elementary classroom setting at the time of the study. All six teachers had master's degrees – five in reading education and one in elementary education.

Students in the participating classrooms who returned parent consent forms and student assent forms participated in the study (97% return rate). In the sample, 55% of the student participants were male. The combined population of the five participating schools was 81% Caucasian, 13% Hispanic, 2% black, 2% Asian, and 3% classified as other or two or more races. Five of the six participating classrooms were at schools designated as a Title I school – schools that receive federal funding due to serving large concentrations of children from low-income households (at least 40%). A combined total of 41% of the students at these schools received free or reduced-cost lunch.

**Data Collection Procedures**

To investigate the research question, the researcher collected quantitative data documenting the reading and spelling development of the first-grade student participants. Informal word recognition, contextual reading and spelling assessments were administered individually to first-grade students ($n = 89$) at three time points across the school year. The researcher also collected qualitative data in order to document the nature of the literacy instruction occurring in the participating classrooms, including the amount of time allotted for the mandated phonics curriculum. The researcher captured the instructional context through informal classroom observations and the collection of data sheets of literacy instructional practices completed by the teacher participants. Following participant

identification and informed consent procedures, collection of both quantitative and qualitative data began in October and continued across the school year at predetermined time points. The data collection schedule is included in Table 1.

**Table 1**

*Data Collection Schedule*

| Measures | BOY<br>October | MOY<br>January to<br>February | EOY<br>late April to<br>May |
|---|---|---|---|
| Assessment Tasks | X | X | X |
| Classroom Observations | X | X | X |
| Instruction Data Sheet | X |  | X |

*Note.* BOY = beginning of year, MOY = middle of year, EOY = end of year

### Procedures for Documenting the Instructional Context

Two sources of qualitative data regarding the classroom literacy instruction were collected from each participating classroom teacher. Prior to the first data collection period with students, teacher participants received a data sheet with questions about the literacy instruction offered in their classrooms (see Appendix A). All teachers provided their daily and weekly classroom schedules as part of this data sheet. Paper copies and digital copies were made available to all teachers. Data sheets were collected in October and returned to teachers in May to provide an opportunity to add, change, or clarify aspects of their instruction that changed over the course of the school year. All participants returned these data sheets at each time point.

During each data collection period, the researcher visited each of the six participating classrooms for informal observations of literacy instruction. Three observations of each teacher were scheduled according to the teacher's classroom schedule and were conducted directly after the student assessment period in October, February, and May, respectively. During each observation, the researcher observed the instruction for the duration of the language arts block, which included phonics, spelling, whole group reading, small group reading, writing, or other areas of literacy instruction. These observations lasted an average of 121 minutes. An observation protocol (see Appendix B) was used to keep detailed notes about the nature of instruction and the time devoted to individual components of the language arts block.

### *Procedures for Quantitative Data Collection*

A reading and spelling assessment battery was administered to all first-grade participants ($n = 89$) at three points across the school year. The assessment battery included four individual tasks: (a) read the words flash and untimed; (b) word recognition-timed, (c) oral passage reading, and (d) spelling. Each of these tasks are described below. All students were examined individually by a member of the data collection team during each assessment period. Assessments were administered in a uniform order in a single session when possible. Occasionally, assessments had to be broken into multiple sessions due to unexpected changes in the school schedule (e.g., field trips; early release due to inclement weather), or student fatigue. Less than 4% (9 out of 258) of the sessions were conducted over more than one session for these reasons. Tasks that included multiple forms were alternated for each participant at successive time points and across participants within a data collection period. Two forms (Form A and Form B) were used for all tasks. Examiners recorded students'

responses on a hard-copy examiner scoring sheet. Students' responses on the oral passage reading task were also audio-recorded. All students were assessed within a three-week window during each data collection period.

The data collection team included the researcher and four graduate students in education graduate programs. The researcher trained each graduate student individually prior to the first data collection period and provided subsequent refresher trainings as a group before the second and final data collection periods. All examiners were provided a "cheat sheet" that included procedures for each task. Explicit directions for each task were also included on the examiner recording sheets in each assessment packet. Most of the assessment tasks required objective recording of student responses, but for the oral passage reading task, which required subjective input regarding the nature of reading errors, the team audio recorded all passage reading. To ensure consistency in administration and scoring of the oral passage reading task, the researcher listened to all recordings collected from BOY, checking the examiner's scoring against their own. The interrater reliability was 81%. The disagreements in scoring were in the number of oral reading errors on a given passage – a number that was used to determine when to discontinue this particular task. None of the examiner errors impacted the administration of the task. Follow-up trainings prior to the second and third data collection periods included a review of the error coding system, the criteria for determining when to discontinue the passage reading task, and the procedures for all other assessment tasks. Additionally, during all data collection periods, the researcher was available to answer questions during administration of the assessments. At MOY and EOY, examiners were asked to leave a note on any assessment tasks that needed to be checked by the researcher. Across both data collection periods examiners left 32 notes for the researcher

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– nine were related to child-specific behaviors (e.g., quiet voice that made it difficult to hear the child; off-task behaviors that may have impacted reading) and 23 were requests for the researcher to listen to the recording and check the number of errors on a given passage (565 passages were administered at MOY and EOY).

**Assessment Tasks**

All student participants were assessed individually in the areas of spelling, word recognition in isolation, oral reading in context. The following provides a description of the quantitative measures used in this study.

*Spelling*

Spelling can offer insight into beginning readers' developing orthographic knowledge (E. Henderson, 1985, Read, 1971). Further, spelling and word-reading skill are highly correlated across the grade levels (Morris & Perney, 1984; Zutell & Rasinski, 1989). The Spelling task included in this assessment battery assessed student's knowledge of printed words using word lists graded in difficulty for frequency of occurrence and orthographic patterns (see Appendix C).

**Test Instrument.** The spelling lists included in this assessment battery were adapted from the Qualitative Inventory of Word Knowledge (QIWK; Schlagal, 1989, 2007). The QIWK was designed to determine a student's developmental spelling level (e.g., first grade, second grade, third grade, and so on). The eight levels of word lists included in the QIWK were created through careful sampling of grade-level words in the Houghton-Mifflin Spelling Program (E. Henderson et al., 1990). As such, the word lists accounted for both frequency of words and frequency of orthographic patterns at each grade level. The first-grade spelling list contains words that occur frequently in the reading and writing of first graders (e.g., *pet,*

*wish, trap, bump)*. For this study, the spelling task consisted of three levels of word lists

graded in difficulty from the first-grade level to the third-grade level. Different forms (A and

B) of the spelling task were included at each level and were alternated at successive data

collection points (Morris, 2015). Both versions of the first-grade and second-grade level lists

were from *Morris Informal Reading Inventory* (2015). To allow for two forms at the third-

grade level the researcher created two versions using the word lists in the QIWK. The third-

grade word lists were controlled for both word frequency and orthographic pattern frequency

at the third-grade level using the Standard Frequency Index (SFI) of *The Educator's Word*

*Frequency Guide* (Zeno et al., 1995). The SFI means for form A and form B of the third-

grade level lists were 55.4 and 55.9, respectively.

      **Administration.** Each student was asked to spell ten words on a given list, beginning

with the first-grade list. For each word, the examiner pronounced the word clearly, read the

word in a simple sentence, and then repeated the word a final time (e.g., "Pet. A kitten is a

pet. Pet."). Students recorded their spelling on a provided sheet of paper numbered from one

to ten. The examiner discontinued the spelling task when the student scored 40% or below on

a given list, which indicated that they had reached frustration level (Morris, 2015). The

Spelling task was administered to all students at each time point.

      **Scoring.** The spelling task was scored in two ways. First, responses on this task were

scored qualitatively for accurate representation of phonemic and orthographic features. For

the purpose of analysis, only the first-grade word list was scored qualitatively. One point was

awarded for a logical representation for each of the following orthographic units: beginning

consonant sound, final consonant sound, and medial short vowel sound. An additional point

was awarded for correctly representing consonant blends, digraphs, preconsonantal nasals,

and long vowel markers. For example, a student who spelled the word "best" as BET correctly represented the initial sound, final sound, and medial sound, but did not represent the final -st blend. As such, the student would receive three out of four possible points for this word.

The developmental scoring system used in this study was developed based on existing developmental scoring systems for spelling (E. Henderson, 1985; Morris, 2015). For each list, the student received a score ranging from 0 to 40 possible points. It is important to note that the qualitative analysis of spelling in this study yielded spelling variations that deviated from the exemplars in previously established developmental scoring systems. For example, few spelling responses were without logical representations of medial vowels, and blends and digraphs were represented in myriad ways. To account for the greater variation in invented spellings, an extended scoring system was established in order to account for the spelling responses of the students in this study. The full developmental spelling scoring system used for qualitative analysis in this study is included in Appendix D.

Responses on the spelling task (first-grade list through third-grade list) were also scored quantitatively for percentage correct. On each spelling list, the student received a score ranging from 0 - 100%. This score was calculated by dividing the number of correct responses by the total number of words on the list (e.g., if a student spelled 7 of 10 words correctly, they received a score of 70% on the list). Criteria for interpreting spelling level (90-100% - independent level; 50-89% - instructional level; and below 40% - frustration level) aligned with previous literature that used a spelling task in an informal reading assessment battery (Invernizzi & Hayes, 2004; Morris, 2015; Tortorelli, 2018, Zutell & Rasinski, 1989).

***Read the Words (RtW-F and RtW-U)***

Evidence of a shared underlying knowledge of words used in reading and spelling can be examined by using the same set of words for both spelling and word identification tasks (Zutell, 2004). The Read the Words task assessed a student's skill in reading words included on the Spelling task administered during a given data collection period. Including a word-reading and spelling task for the same set of words provided data regarding a student's utilization of an underlying word knowledge to both read and spell words.

**Test Instrument.** For this task, the word lists used in the Spelling task were formatted to assess automatic recognition of the same words when presented in isolation (see Appendix E). The instrument, administration, and scoring for this task were designed based on a traditional word recognition task in which both the flash and untimed scores are recorded. The word lists were formatted so that they were easy for young children to read (i.e., larger font, more spacing between words). Each word list contained ten words that were graded in difficulty and selected based on spelling patterns and frequency of words for the given level. A full description of the word lists used in this task are provided in the discussion of the Spelling task.

**Administration.** The examiner began with the first word on the first-grade list for all participants. Using two small tiles, the examiner "flashed" each word on the list to the child for approximately ½ second. After each word was flashed and read correctly by the student, the examiner continued down the list. If the student incorrectly read a word, the examiner opened up the tiles to show the misread word and prompted the student to try it again. In this way, the student was presented with an opportunity to decode the word. Words identified during the initial ½ second flash were considered to be known automatically.

**Scoring.** This task yielded two scores for each list – a flash score and an untimed score. The flash score indicated the percentage of words the student read accurately and automatically. The untimed score was a cumulative score indicating the percentage of words read correctly on the entire list, both in the flash and untimed presentation. For example, if a student read four out of ten words correctly in the timed presentation, they would receive a flash score of 40%. If the student was able to decode three additional words (30%) in the untimed presentation, they would receive an untimed score of 70%.

### *Word Recognition-Timed (WR-T)*

For beginning readers to make progress in reading, they must be able to identify words quickly and accurately. The word recognition-timed task assessed a student's skill in recognizing words accurately and automatically (Morris, 2015). As established in Morris et al. (2017), this word recognition task, when compared with a nonword reading task, was found to be the better predictor of contextual reading skill. The predictive validity coefficients for the word recognition task were .87 and .94 (Morris, 2015).

**Test Instrument**. For this second task in the assessment battery, the student read as many individual words as they could in one minute (see Appendix F). The WR-T instrument (Morris, 2015) consisted of 90 words, arrayed in rows of six words. Selected from the Harris and Jacobson (1982) grade-level lists, the words were graded in difficulty, ranging from early first-grade level to third-grade level. The words ascended by increasing difficulty and included the following levels: (a) 14 early-first grade words, (b) 18 mid-first grade words, (c) nine late-first grade words, (d) 20 second-grade words, and (e) ten third-grade words. Two forms (A and B) of the word list were alternated at successive assessment points.

**Administration.** The examiner asked each student to read as many words as they could in one minute. As the student read, the examiner recorded the student's errors by marking through mispronunciations or skipped words. If the student hesitated on a word, or attempted to sound it out, the examiner allowed three seconds before marking the word as incorrect and directing the student to keep reading. The examiner stopped the task after 60 seconds.

**Scoring.** The WR-T task was scored for the total number of words read correctly, ranging from 0 to 90 words. If a student was able to read all of the words before the full minute elapsed, they received a score of 90.

### Oral Passage Reading

Listening to children read orally provides a "window" into the process of learning to read (Morris, 2015, p. 23). The oral passage reading component of this assessment battery focused on students' ability to process connected text. Students' contextual reading was assessed in terms of their reading accuracy, reading fluency, and comprehension of the text.

**Test Instrument.** The oral passage-reading task consisted of short passages (see Appendix G) taken from Morris Informal Reading Inventory (2015). Preprimer level through third-grade level passages were included in the assessment battery (see Table 2). Forms A and B were alternated at successive points throughout the study. The length of the passages varied from 100 words on the preprimer 2, primer and first-grade level passages to 168 words on the third-grade passage. Mean passage length was 116 words. Each passage was written in narrative form and most passages were based on common childhood experiences (e.g., losing a tooth) or familiar traditional tales (e.g., the fox and the grapes). Passage reading was followed by a set of four to six passage-dependent comprehension questions. The

comprehension questions for the levels included in this task were explicit in nature and involved literal recall of the story. Students were not allowed to look back at the story to aid in their responses to the comprehension questions.

**Table 2**

*Oral Passage Reading Levels: Preprimer 2 through Third Grade*

| Reading Level | F & P level | Form A | Form B |
| --- | --- | --- | --- |
| Preprimer 2 | D/E | "Baby Bear" | "Little Bulldozer" |
| Primer | G/H | "Clouds" | "Ben's Tooth" |
| Late first grade | I/J | "Ice Cream" | "Sledding" |
| Second | -- | "Fox and Grapes" | "Fox and Crow" |
| Third | -- | "Maggie and the Goose" | "Edward's Kitten" |

*Note.* F & P = Fountas and Pinnell reading level. Adapted from *Morris informal reading inventory* by D. Morris. Copyright 2015 by Guilford Press.

**Administration.** Each student began the oral reading task with the preprimer 2 passages at all time points. All passage reading was audio recorded. At the start of the oral passage reading task, the examiner described the task to the student: "You are going to read aloud this story and then I will ask you some questions about it. I am going to record your reading so that later I can go back and listen to it" (Morris, 2015). Before beginning each passage, the examiner gave a brief predetermined introduction to the story (e.g., "This story is about a little bulldozer.") and directed the student to begin reading aloud.

The examiner timed the reading with a stopwatch and marked the passage for errors as the student read. Oral reading errors were coded using the coding system from Morris IRI (2015; see Table 3). The examiner recorded five types of oral reading errors: substitutions, insertions, omissions, self-corrections, and teacher helps. Repetitions were not counted as errors, but were recorded by underlining the repeated word or phrase. After the student finished reading each passage, the examiner posed the predetermined comprehension questions included in the Morris IRI.

**Table 3**

*Coding System for Oral Reading Errors*

| Error Type | Directions for Coding the Error | Example |
|---|---|---|
| Substitutions | Write the substituted or mispronounced word over the word in the text. | saw<br>the boy was |
| Omissions | Circle the omitted word. | the (big) boy |
| Insertions | Use a caret to indicate the inserted word. | big<br>the red ball<br>^ |
| Self-corrections | Place a check (✓) next to the marked error to indicate that the child has self-corrected. | saw ✓<br>the boy was |
| Examiner help | Place an "H" above each word that has to be provided by the examiner. The examiner should not provide help unless it is clearly necessary to do so. Wait three seconds before providing help. | H<br>the boy was |

*Note.* Adapted from *Morris informal reading inventory,* by D. Morris, p. 26. Copyright 2015 by Guilford Press.

Each student attempted to read at least one passage. Based on student performance, the examiner decided whether to administer the next passage level or discontinue the assessment because a frustration level had been reached. To ensure consistency across examiners in administering the passages, cutoff scores for accuracy and rate minimums were used in this evaluation (see Table 4; Morris, 2015). If the student reached frustration level in either reading accuracy or reading rate on a given passage, no additional passage levels were administered.

**Table 4**

*Examiner Criteria for Determining Subsequent Oral Passage Reading Administration*

| Passage Level | Accuracy and Rate Criteria |
|---|---|
| Preprimer 2 | Discontinue if the child makes more than 10 errors (90%) or takes longer than 200 seconds (30 wpm) to read the passage. |
| Primer | Discontinue if the child makes more than 10 errors (90%) or takes longer than 150 seconds (40 wpm) to read the passage. |
| Late-first grade | Discontinue if the child makes more than 10 errors (90%) or takes longer than 120 seconds (50 wpm) to read the passage. |
| Second grade | Form A: Discontinue if the child makes more than 12 (90%) errors or takes longer than 146 (50 wpm) seconds to read the passage. Form B: Discontinue if the child makes more than 13 (90%) errors or takes longer than 151 (50 wpm) seconds to read the passage. |
| Third grade | Form A: Discontinue if the child makes more than 15 errors (90%) or takes longer than 117 (75 wpm) seconds to read the passage. Form B: Discontinue if the child makes more than 16 errors or takes longer than 134 (75 wpm) seconds to read the passage. |

*Note.* Criteria for determining whether to continue or discontinue oral passage reading were established using oral reading accuracy and rate cutoff scores from *Morris informal reading inventory*, by D. Morris. Copyright 2015 by Guilford Press. Criteria for rate cutoff scores for second and third grade from D. Morris, personal communication, July 2018.

**Scoring.** After administering each oral passage, the examiner calculated three scores: (1) reading accuracy, (2) reading rate, and (3) reading comprehension. Reading accuracy is the percentage of words read correctly (0-100%). To calculate reading accuracy, the examiner divided the number of words read accurately by the total number of words in the passage (e.g., 94/100 x 100 to yield an accuracy percentage of 94%).

Reading rate is the number of words read per minute (wpm). To calculate this score, the number of words in the passage was multiplied by 60 and then divided by the number of seconds the student took to read the passage. For example, if a student read a 100-word passage in 125 seconds, their reading rate would be 48 wpm (100 x 60 / 125). Reading comprehension is the percentage of comprehension questions answered correctly. The examiner calculated this score by dividing the number of questions answered correctly by the total number of questions asked (e.g., if a student answered three out of four questions correctly, their comprehension score would be 75%).

**Qualitative Measures**

*Literacy Instruction Data Sheet*

Teacher participants completed a data sheet regarding the nature of the literacy instruction offered in their classrooms at the beginning and end of the study (see Appendix A). The data sheet was open-ended and addressed participant's teaching experience and specific aspects of their classroom literacy instruction. The data sheet had three sections: (1) reading instruction, (b) spelling instruction, and (c) writing instruction. Within each section, questions about the method of delivery, materials used, and amount of time allotted daily were included to gain insight about literacy instruction provided in each classroom. Participating teachers also shared their daily classroom schedule at the start of the study.

*Literacy Instruction Observation Guide*

During classroom observations, an observation protocol was used to assist the researcher in organizing notes about the classroom literacy instruction (see Appendix B). Details about the nature of the instruction, methods and materials used, and time spent teaching each component of the language arts block (e.g., phonics instruction, whole group reading, small group reading, independent reading, writing instruction) were collected on this form. To document time during each classroom observation, the researcher recorded the start and end time for each component of the observed language arts instruction.

**Data Analysis**

The purpose of this study was to examine the reading and spelling development of first-grade students in an instructional context where explicit, systematic phonics instruction played a primary role. The quantitative and qualitative datasets were first analyzed separately, and then combined to create an understanding of the instructional context in which the first graders in this study were learning to read and spell. Quantitative data was analyzed using SPSS Statistics and Microsoft Excel and data were screened for normality to ensure the reasonableness of the data.

To address the research question of how reading and spelling develops in first graders receiving a minimum of 40 minutes daily mandated phonics curriculum, the researcher applied descriptive statistics to describe the overall growth in spelling and word recognition for all first graders in the study. Additionally, the researcher formed three groups of participants in order to examine the progress for different levels of reading readiness. WR-T at BOY was used to form high-, average-, and low-readiness groups (see Table 5).

Descriptive statistics and effect sizes (reported as Hedges's *g*) were used to make group comparisons of the discrepancy between spelling and word recognition.

**Table 5**

*Three Reading-Readiness Groups (High, Average, and Low) Based on Word Recognition-timed (WR-T) Scores at BOY*

| Readiness Group | *n* | Percentage of Sample | WR-T score (0-90) | | |
|---|---|---|---|---|---|
| | | | Median | Range | Percentile group |
| High | 28 | 31.5% | 42.5 | 31-86 | 69-99 |
| Average | 30 | 33.7% | 19 | 14-29 | 35-68 |
| Low | 31 | 34.8% | 9 | 0-13 | 0-31 |
| Total | 89 | 100% | 19 | 0-86 | |

Qualitative data yielded from classroom observations and data sheets were analyzed with the goal of documenting the instructional context from which the participants in this study were drawn. Specifically, qualitative data was used to create a description of the instructional context to situate the overall growth in word knowledge of all participants. One important aspect of this description included quantifying time allocated for different components of language arts instruction.

## Chapter Four

## Results

This dissertation examined first graders' reading and spelling development along a number of continuums, including word recognition, spelling, and oral contextual reading. While many studies exist documenting the development of these early literacy skills, the present study examined first graders' development in an instructional context where the majority of language arts instruction was explicit, systematic phonics. To this end, the results presented in this chapter address the research question of this study: How do reading and spelling develop in first graders receiving a minimum of 40 minutes daily mandated phonics curriculum?

A description of the instructional context is provided first to situate the results of this study in the context of interest. The major findings reported in this chapter involve two types of analysis including descriptive statistics for the overall sample and reading and spelling profile comparisons for students from each of the three reading-readiness groups. These data were collected at the beginning (BOY), middle (MOY), and end (EOY) of the school year.

**Overview of the Instructional Context**

The theories that inform our understanding of children's reading and spelling development (Chall, 1983; Ehri, 1998; E. Henderson, 1981) were developed prior to policy changes (Armbruster et al., 2001) that led to an instructional context in which phonics acquired a primary role. This study did not address differences between instructional contexts, but did acknowledge that the learning environment has an impact on how children acquire literacy skills. Classroom observations of literacy instruction and data sheets completed by participating teachers provided descriptions of the participants' instructional

context. Thus, the focus of the descriptive portion of this study was to document the nature of the literacy instruction occurring in participating classrooms, along with the materials that were utilized and the time that was devoted to various components of the literacy block. While there were differences in the literacy instruction across the six participating classrooms, there were many similarities in the structure of the literacy instruction and in the materials teachers used.

### *Instructional Time Allocation*

The average time allotted for literacy instruction in the six classrooms each day was a little more than two hours. Figure 2 provides an overview of the average time spent on various components of literacy instruction per day. In all classrooms, phonics instruction was delivered at the start of the school day, typically the first 30 to 45 minutes of instruction after students arrived at school. All six classrooms used the same phonics curriculum as required by the school system. During the remainder of the literacy block, teachers in every classroom utilized homogenous small groups in which they worked with groups of students at the same reading level. The average amount of time allocated for teachers to meet with each small group of students for contextual reading practice ranged from nine to 16 minutes each day. Various instructional materials were used for small group reading instruction, including leveled guided reading texts, basal readers, decodable texts, short decodable passages and poems from the phonics curriculum, and other passages and stories from digital resources, such as *Teachers Pay Teachers* and *Reading A to Z.* It is important to note that teachers also used materials and resources that were not focused on contextual reading practice during their small group instructional time. These materials included phonetically regular nonword

(e.g., wep, nuf) flash cards, sight word flash cards, and graphic organizers focused on comprehension strategies.

During small group instruction, students who were not working with teachers rotated through literacy stations in the classrooms. For the most part, this independent work focused on three types of activities: (a) additional practice with phonics patterns through word sorting or phonics worksheets, (b) independent reading practice, in which students read to themselves in either self-selected digital and physical texts or a common text assigned by the teacher, and (c) independent writing practice, in which students wrote in writing journals about a topic of their choice. The typical structure for this part of the literacy block had students completing three or four independent activities and a small group session with the teacher. Three of the classrooms had an additional small group session in which students worked with a teacher assistant or reading specialist on phonics activities, including word sorts or phonics games.

All classrooms had a time dedicated each day to whole-class reading instruction that included one or both activities: (a) a read aloud, in which the teacher read a book or other short text aloud to all students, and (b) a shared reading of a short text, in which the teacher and students read the same text together. Teachers used children's literature, decodable stories from the phonics curriculum, and poetry during whole class reading instruction. Half of the participating classrooms had a dedicated time for writing instruction; however, for classrooms who did not have a period of time devoted to writing instruction, this component of the literacy block accounted for less than ten minutes of their total literacy instruction. On average, phonics instruction consumed 40% of the daily literacy time compared to the 11%

used for small group reading instruction, a time dedicated to supporting students in reading text at their instructional levels.

**Figure 2**

*Average Use of Literacy Instructional Time Per Day Across the Six Participating Classrooms*
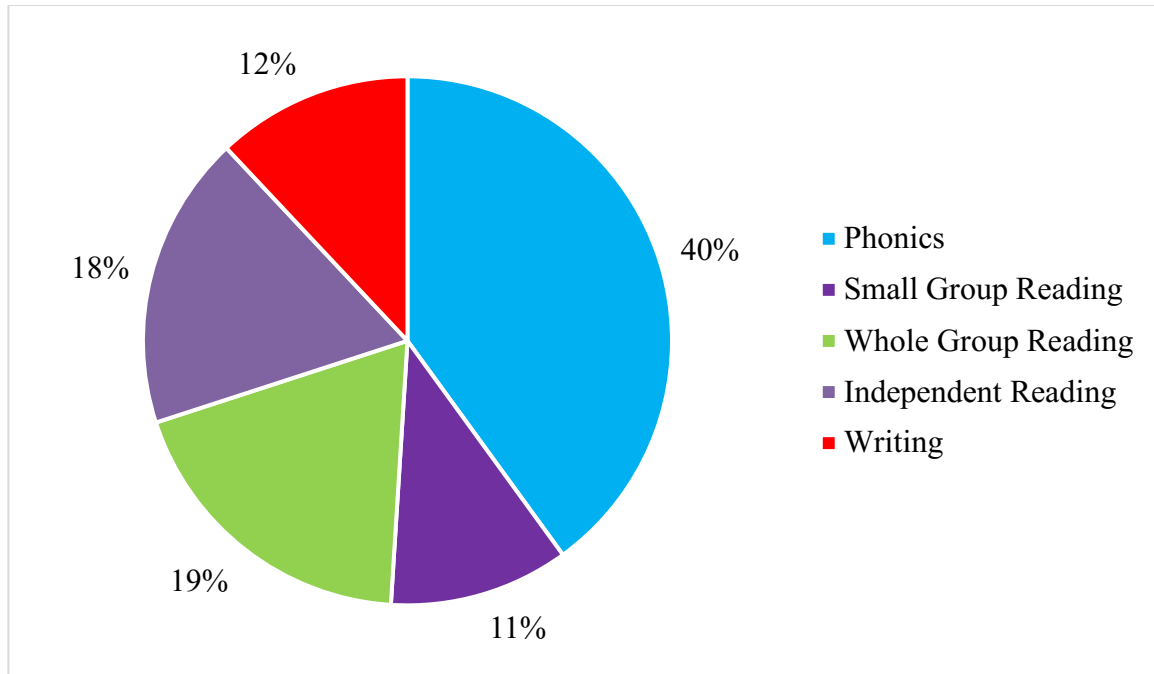


*Note.* Combined averages were calculated using averages from each teacher's reported data about time spent on various components of literacy instruction as well as from researcher documentation of time from classroom observations.

**Analysis of Spelling and Reading Development Across All Participants**

*Word Recognition-Timed and Spelling*

Descriptive data for Word Recognition-Timed (WR-T) and Spelling for all participants are shown in Table 6. Overall, these data show a trend of steady growth in WR-T across all time points. Average growth between successive assessment periods was 11 words

from BOY to MOY and 9 words from MOY to EOY. The mean scores for WR-T nearly

doubled from BOY (25) to EOY (45). The mean spelling scores for all participants do not

follow the same trajectory. The Spelling task had a ceiling effect (40 points possible on the

development scoring scale used to score the first-grade Spelling task in this study) which

restricted improvement once students were able to correctly represent all of the letter sounds

(i.e., initial and final consonants, medial short vowels) and orthographic features (e.g., -ck,

silent-e) included on the list of first-grade words. The mean spelling score increased by three

points from BOY to MOY and two points from MOY to EOY. While growth on the Spelling

task was limited by the 40-point ceiling, the mean score at BOY was relatively high, which

further limited growth across the year. On average, participants received 84% of the possible

points on the qualitative scoring system for the first-grade spelling list at the BOY

assessment period (33.4 points / 40 possible points = 84%). The full developmental spelling

scoring system used for qualitative analysis in this study is included in Appendix D.

**Table 6**

*Descriptive Statistics for Spelling and Word Recognition (Overall)*

| Time | | Measures | | |
|------|------|------|------|------|
| | *N* | Spelling | | WR-T |
| | | *M*  *(SD)* | | *M*  *(SD)* |
| BOY | 89 | 33.42  *(5.52)* | | 24.53  *(18.39)* |
| MOY | 85 | 35.84  *(4.54)* | | 35.83  *(23.03)* |
| EOY | 84 | 37.99  *(2.57)* | | 45.36  *(22.86)* |

*Note.* WR-T = word recognition, BOY = beginning-of-year data point (October), MOY =

mid-year data point (January-February), and EOY = end-of-year data point (April-May).

*Diagnostic Reading Levels*

The mean words correct per minute (WCPM), reading accuracy, reading rate, and reading comprehension scores are summarized in Table 7. Some students were unable to read all passages with minimum rate and accuracy scores; thus, the most relevant way to examine the oral reading development of the entire sample is to look at average reading performance on grade-level passages (BOY = Preprimer 2, MOY = Primer, and EOY = Late-first). Yet, looking at oral reading data across all participants provides a skewed picture of contextual reading. The oral reading task was discontinued once students reached frustrational level; that is, their reading rate or reading accuracy score fell below the minimum criteria for acceptable accuracy and rate scores (i.e., accuracy below 90%; rate below 30 wpm at preprimer 2, 40 wpm at primer, 50 wpm at late-first grade, 50 wpm at second grade, and 75 wpm at third grade). Because of this, the sample sizes for each passage level were not equivalent across time points.

As was expected, mean rate and accuracy scores steadily improved across the year when looking at the overall dataset. At BOY, all students were administered the Preprimer 2 passage (early-first grade) and did so with a reasonable rate (an average of 49 wpm), but with an accuracy score that fell below instructional level for a first-grade reader (an average of 82%). Comprehension scores indicated that students were reading with relative understanding at all time points (averages of 81% at BOY, 93% at MOY, and 95% at EOY). However, the achievement discrepancy shows up in the data from MOY. Approximately 69% of participants were able to attempt the Primer (mid-first grade) passage at the middle of the year. The mean accuracy and rate scores for those who read the Primer passage were relatively high (94% and 70 wpm, respectively). At EOY, 74% of students were able to

attempt the late-first-grade passage. Of the students who read the late-first-grade passage at EOY, the mean accuracy and rate scores (94% accuracy and 80 wpm, respectively) indicated that they were reading at an instructional or independent level (see Appendix H, for references of the criteria). Given the participants' varied reading skill at MOY and EOY, it is prudent to examine the developmental trajectories for students at different levels of reading readiness.

**Table 7**

*Descriptive Statistics for Oral Reading Performance*

| Time | Passage Level | | | Measures | | |
|------|---------------|---|---|----------|---|---|
| | | *N* | WCPM | Accuracy (%) | Rate (wpm) | Comp. (%) |
| | | | *M (SD)* | *M (SD)* | *M (SD)* | *M (SD)* |
| BOY | Preprimer 2 | 89 | 44.76 *(32.53)* | 81.61 *(23.34)* | 48.84 *(30.17)* | 81.04 *(31.98)* |
| MOY | Primer | 59 | 67.32 *(30.50)* | 93.66 *(4.76)* | 70.02 *(29.66)* | 92.50 *(14.38)* |
| EOY | Late-first | 62 | 77.50 *(37.19)* | 94.21 *(3.99)* | 80.24 *(33.84)* | 94.98 *(11.59)* |

*Note.* WCPM = words correct per minute, Comp = comprehension, BOY = beginning-of-year data point (October), MOY = mid-year data point (January-February), and EOY = end-of-year data point (April-May).

**Analysis of Spelling and Reading Development Across Three Reading-Readiness Groups**

***WR-T and Spelling***

As described in Chapter Three, the researcher divided the participants into three reading-readiness groups based on WR-T at BOY. These data were used to form high, average, and low reading-readiness groups in order to examine the developmental trajectories

of first graders at different levels of reading and spelling skill. Descriptive data for WR-T and

Spelling for each reading-readiness group are shown in Table 8. Data plots of the mean

growth in WR-T and spelling are shown in Figures 3 and 4. For each group, growth in WR-T

was steady across the school year. It is interesting to note that the mean rate of growth in

WR-T was similar for students in the average and high groups (24 and 23 words,

respectively), but for students in the low group the mean growth was 15 words. While the

low-readiness readers made steady progress in WR-T, they did so at a much slower pace than

their average- and high-readiness peers. A visual analysis of the growth trajectories of each

readiness group (see Figures 3 and 4) indicates that students who were similar in their level

of spelling knowledge were different in their word recognition skill.

**Table 8**

*Descriptive Statistics for Spelling and Word Recognition (by Reading-Readiness group)*

| Time | | Measures | | |
|---|---|---|---|---|
| | | Spelling | | WR-T |
| | *N* | *M* | *(SD)* | *M* *(SD)* |
| | | Low Group | | |
| BOY | 31 | 28.84 | *(5.97)* | 8.84 *(3.28)* |
| MOY | 30 | 32.10 | *(5.65)* | 15.00 *(6.13)* |
| EOY | 29 | 35.76 | *(3.01)* | 24.21 *(11.66)* |
| | | Average Group | | |
| BOY | 30 | 34.37 | *(3.35)* | 19.33 *(5.22)* |
| MOY | 28 | 36.93 | *(1.74)* | 30.11 *(11.01)* |
| EOY | 28 | 38.71 | *(1.30)* | 43.04 *(13.46)* |
| | | High Group | | |
| BOY | 28 | 37.46 | *(2.38)* | 47.46 *(14.51)* |
| MOY | 28 | 38.75 | *(1.43)* | 63.86 *(13.35)* |
| EOY | 27 | 39.63 | *(0.79)* | 70.48 *(13.17)* |

*Note.* WR-T = word recognition, BOY = beginning-of-year data point (October), MOY =

mid- year data point (January-February), and EOY = end-of-year data point (April-May).

**Figure 3**

*Average Growth in WR-T Across Three Reading-Readiness Groups*
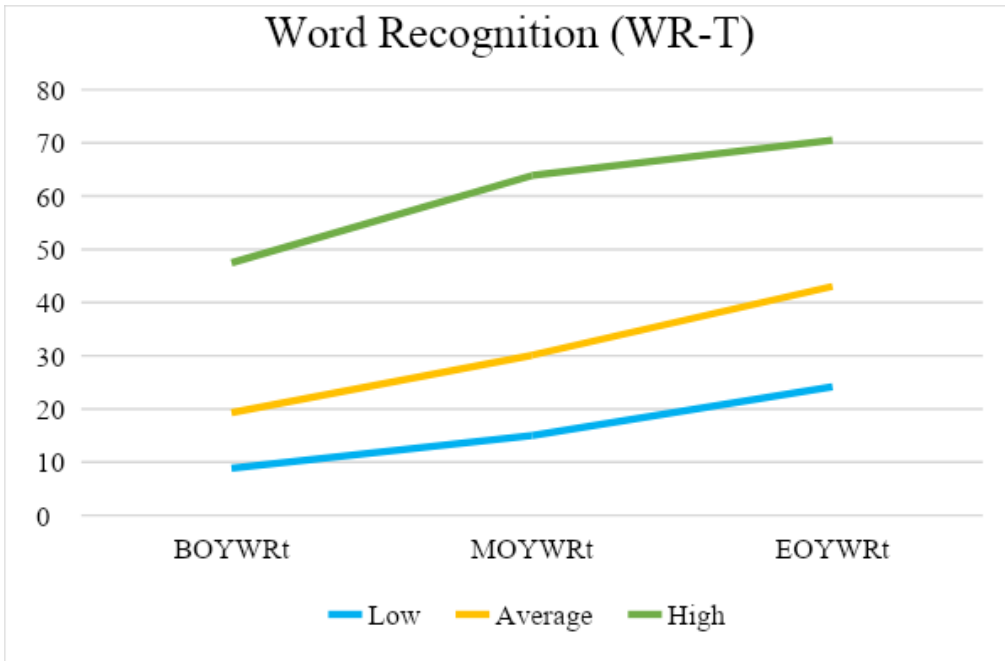


**Figure 4**

*Average Growth in Spelling Across Three Reading-Readiness Groups*
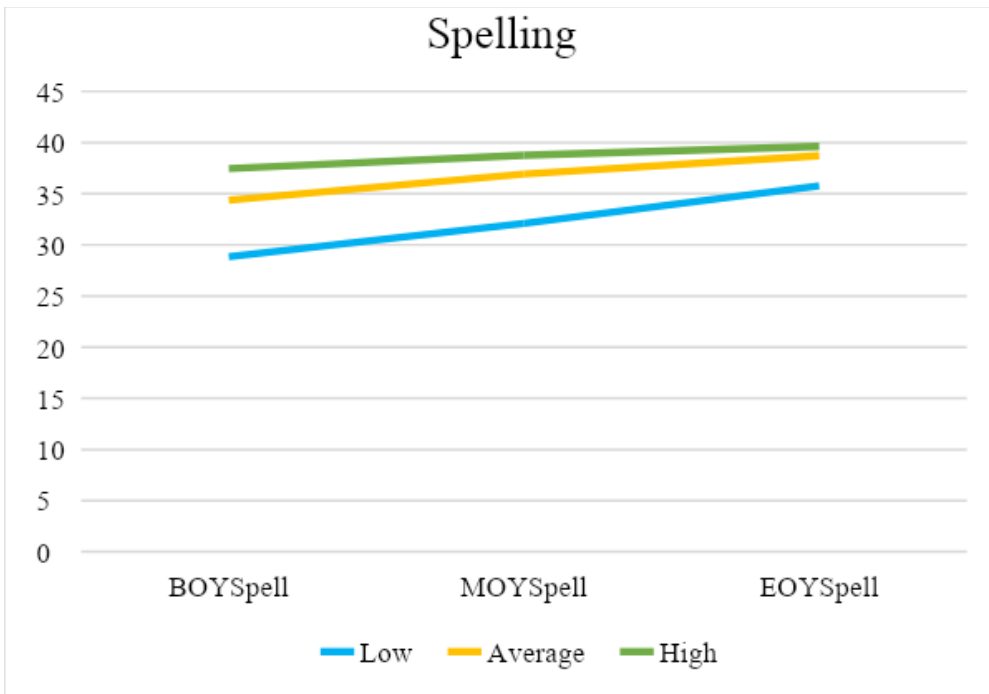
To understand the magnitude of the discrepancy in WR-T and Spelling between the three reading-readiness groups, effect sizes (standardized mean difference adjusted for small samples; or Hedges's $g$s) were calculated to make comparisons between the low group and the other groups (average and high). Hedges's $g$s comparing these two variables are reported in Table 9. J. Cohen (1988) outlined what constitutes small, medium, and large effect sizes (0.2, 0.5, and 0.8, respectively); however, he suggested that these numbers are only guidelines and may vary from discipline to discipline. The nature of the diagnostic data (i.e., small sample sizes in groups, comparisons of groups formed to represent low-, average-, and high-readiness readers) used in this analysis requires that J. Cohen's criteria be adapted for this particular context, particularly considering that all Hedges's $g$s exceed an absolute value of 1 in this analysis. Therefore, each Hedges's $g$ is compared to other Hedges's $g$s from this analysis to determine relative discrepancies between spelling and WR-T for each comparison. Additionally, it is important to bear in mind when comparing Hedges's $g$s that these readiness groups were formed at BOY based on WR-T scores.

The comparison of the Hedges's $g$s suggested the discrepancies were much larger for WR-T than for spelling. Across time points, the low and high groups differed in WR-T by an effect size of at least 3.72 in spelling by at least 1.59. The discrepancy between the low and average groups for WR-T decreased from -2.42 to -1.49 by the final time point. For spelling, the discrepancy remained fairly stable across the year, with an effect size of just greater than 1 between the two groups across the year. Overall, the magnitude of discrepancy between the low and average groups and the low and high groups remained larger at all time points for WR-T than for spelling.

**Table 9**

*Effect Size Comparisons of Spelling and WR-T*

| | Groups | Spelling | | WR-T | |
|---|---|---|---|---|---|
| | | Hedges's *g* | 95% CI | Hedges's *g* | 95% CI |
| BOY | Low Average | -1.15 | [-1.69, -0.61] | -2.42 | [-3.08, -1.76] |
| | Low High | -1.87 | [-2.48, -1.26] | -3.77 | [-4.62, -2.92] |
| MOY | Low Average | -1.13 | [-1.68, -0.57] | -1.71 | [-2.32, -1.11] |
| | Low High | -1.59 | [-2.18, -1.00] | -4.78 | (-5.79, -3.77] |
| EOY | Low Average | -1.25 | [-1.81, -0.68] | -1.49 | (-2.08, -0.90] |
| | Low High | -1.70 | [-2.32, -1.09] | -3.72 | (-4.59, -2.86] |

*Note.* WR-T = word recognition, BOY = beginning-of-year data point (October), MOY = mid-year data point (January-February), and EOY = end-of-year data point (April-May).

### Group-specific Text Reading Accuracy, Rate, Comprehension, and Diagnostic Levels

The discrepancy between groups is further illustrated by the oral reading accuracy and oral reading rate means for each reading-readiness group shown in Table 10. The mean accuracy and rate scores for the high-readiness readers indicate that students in this group could comfortably read grade-level text at all time points; their scores far exceeded the instructional-level criteria for each passage level (i.e., accuracy at 90% or above, and minimum rate of 30 words per minute for Preprimer 2, 40 words per minute for Primer, and 50 words per minute for Late First). For students in the average reading-readiness group, grade-level text was the threshold of what they could comfortably read, as indicated by mean accuracy scores hovering around 90% and mean rate scores around 10 words above the minimum acceptable rate for the Preprimer 2 and Primer passages. Students in the low

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readiness-reading group did not read beyond their frustrational level. For these students,

grade-level text was much too difficult. This is explained by the fact that at BOY the mean

scores show that they were unable to read the text with a grade-level accuracy or rate. Less

than one-third of students in the low group were able to attempt the grade level passages at

subsequent time points.

**Table 10**

*Descriptive Statistics for Grade-Level Passage Reading Scores by Reading-Readiness*

*Groups*

| Group | | WCPM | | Accuracy (%) | | Rate (wpm) | | Comp. (%) | |
|---|---|---|---|---|---|---|---|---|---|
| | *N* | *M* | *(SD)* | *M* | *(SD)* | *M* | *(SD)* | *M* | *(SD)* |
| | | | | BOY Preprimer 2 Passage | | | | | |
| Low | 31 | 16.86 | *(9.47)* | 59.23 | *(26.95)* | 23.81 | *(8.73)* | 61.30 | *(42.97)* |
| Average | 30 | 35.97 | *(13.89)* | 89.80 | *(6.60)* | 39.77 | *(12.82)* | 92.08 | *(14.49)* |
| High | 28 | 85.07 | *(21.87)* | 97.61 | *(2.47)* | 86.29 | *(21.00)* | 90.52 | *(19.20)* |
| | | | | MOY Mid-First (Primer) Passage | | | | | |
| Low | 6 | 34.76 | *(7.01)* | 88.50 | *(4.14)* | 42.67 | *(9.54)* | 100.00 | *(0.00)* |
| Average | 25 | 46.78 | *(13.33)* | 91.33 | *(4.63)* | 50.21 | *(13.14)* | 88.08 | *(18.21)* |
| High | 28 | 91.19 | *(25.15)* | 96.75 | *(2.40)* | 92.86 | *(25.24)* | 94.68 | *(10.92)* |
| | | | | EOY Late-First-Grade Passage | | | | | |
| Low | 9 | 45.61 | *(9.81)* | 91.30 | *(2.58)* | 51.30 | *(11.22)* | 97.50 | *(7.91)* |
| Average | 26 | 55.33 | *(17.61)* | 92.48 | *(4.30)* | 59.96 | *(17.49)* | 95.00 | *(12.50)* |
| High | 27 | 107.60 | *(33.07)* | 96.89 | *(2.10)* | 109.74 | *(27.18)* | 94.04 | *(12.08)* |

*Note.* WCPM = words correct per minute, Comp = comprehension, BOY = beginning-of-

year data point (October), MOY = mid-year data point (January-February), and EOY = end-

of-year data point (April-May).

To further examine the contextual reading performance of students in each reading-readiness group (groups were formed based on WR-T at BOY), the three scores yielded from the oral passage reading task (accuracy, rate, and comprehension) were used to determine each student's instructional reading level at each time point. The instructional reading level performance criteria from Morris (2015) is summarized in Appendix H and the total number of participants at each instructional reading level is summarized in Table 11. Instructional level classifications show that 100% of students in the high-readiness group could comfortably read in late-first grade text or higher at EOY. In comparison, 64% of students in the average group and only 21% of students in the low group had an instructional reading level at late-first grade or higher at EOY. Sixty-six percent of the students in the low group were a year or more behind in reading at the end of first grade. In summary, most students' instructional reading levels grew across the year, but 39% of all participants did not meet the instructional level criteria for reading grade-level text (late-first-grade level) at EOY.

**Table 11**

*Instructional Reading Level Classifications Across Three Reading-Readiness Groups*

| Instructional Level | Low | | | Average | | | High | | |
|---|---|---|---|---|---|---|---|---|---|
| | BOY | MOY | EOY | BOY | MOY | EOY | BOY | MOY | EOY |
| Emergent | 30 | 19 | 6 | 14 | 3 | 1 | | | |
| Preprimer 2 | 1 | 9 | 13 | 15 | 8 | 2 | 3 | | |
| Primer | | 2 | 4 | 1 | 11 | 7 | 8 | | |
| Late-First | | | 5 | | 6 | 14 | 7 | 10 | 2 |
| Second | | | 1 | | | 4 | 6 | 9 | 9 |
| Third | | | | | | | 4 | 9 | 16 |

*Note.* BOY = beginning-of-year data point (October), MOY = mid-year data point (January-February), and EOY = end-of-year data point (April-May); Numeric values indicate number of students for each criterion and time point.

### *Read the Words Flash and Untimed*

For the Read the Words task, flash (RtW-F) and untimed (RtW-U) presentations were administered for each word on the list. The RtW-U score indicates the number of words that were able to be decoded when unlimited time was provided to do so. Both of these measures utilized the same list of words and students were only given an opportunity to decode words that they could not read automatically during the flash presentation. The RtW-F score indicates the number of words read correctly when each was presented for a ½ second duration, a task designed to assess automaticity in reading words on a graded word list. The same word lists used for the Spelling task were used for the Read the Words task. For each task, students began with the first-grade word list and continued on to a subsequent list until they either completed the third-grade list or reached frustration level as indicated by a score

of 50% or less on a given list. Descriptive data for RtW-F, RtW-U, and Spelling task for the first-grade word list are shown in Table 12.

**First-Grade Word List.** With the exception of the BOY score for the low-readiness group, RtW-U scores on the first-grade word list were higher than the RtW-F and Spelling scores; that is, on average, students were able to decode more words than they could spell correctly or read with automaticity. The mean scores (Spelling and RtW-F) for the high group reveal a pattern in which students were able to read with automaticity more words than they could spell on a given list. Although this difference exists, the discrepancy between RtW-F and Spelling was small (roughly 5-10% difference at all time points).

A distinctly different pattern emerged for students in the other reading-readiness groups. Students in both the average and low groups were able to spell words on the first-grade word list that they could not read with automaticity. For the average group, the difference between the spelling and RtW-F scores did decrease across time points. At BOY, students in the average group correctly spelled 22% more words than they read on the RtW-F task. The difference between these two scores dropped to 13% at EOY. Although students in the low group exhibited a similar pattern in which they were able to spell words that they could not read with automaticity, the discrepancy between their spelling and RtW-F scores did not decrease across the year. At each time point, the low-readiness readers were able to correctly spell roughly 20% more words than they could read with automaticity.

**Table 12**

*Comparisons of Words Correct on Read the Words (RtW-F and RtW-U) and Spelling*

| Time | | RtW-F | | RtW-U | | Spelling | |
|---|---|---|---|---|---|---|---|
| | *N* | *M* | *(SD)* | *M* | *(SD)* | *M* | *(SD)* |
| | | | Low Group | | | | |
| BOY | 31 | 0.48 | *(0.81)* | 2.35 | *(1.92)* | 2.61 | *(1.89)* |
| MOY | 30 | 1.83 | *(1.86)* | 5.03 | *(2.31)* | 3.83 | *(1.66)* |
| EOY | 29 | 3.79 | *(2.18)* | 7.41 | *(2.60)* | 5.97 | *(2.31)* |
| | | | Average Group | | | | |
| BOY | 30 | 2.57 | *(1.74)* | 6.07 | *(2.23)* | 4.77 | *(2.03)* |
| MOY | 28 | 5.32 | *(2.58)* | 8.46 | *(1.53)* | 6.64 | *(1.57)* |
| EOY | 28 | 7.21 | *(2.13)* | 9.46 | *(0.96)* | 8.53 | *(1.33)* |
| | | | High Group | | | | |
| BOY | 28 | 7.50 | *(2.24)* | 9.43 | *(0.92)* | 6.96 | *(1.69)* |
| MOY | 28 | 9.29 | *(0.76)* | 9.86 | *(0.36)* | 8.21 | *(1.55)* |
| EOY | 27 | 9.52 | *(0.64)* | 10.00 | *(1.11)* | 9.15 | *(1.13)* |

*Note.* All measures are expressed as the average number of words correct on the first-grade word list. RtW-F = Read the words flash presentation, RtW-U = Read the words untimed presentation, BOY = beginning-of-year data point (October), MOY = mid-year data point (January-February), and EOY = end-of-year data point (April-May).

**Average and High-Readiness Group Post-Hoc Analysis.** One question that emerged from the data on the first-grade word list for both the average and high-readiness groups is whether the same pattern exists for these groups when they are asked to read and spell more challenging words. Scores on the first-grade word list indicate that the low-readiness group experienced frustration in both reading and spelling these words, but the other two groups' mean scores are above frustration level at all time points (with the exception of the average group at BOY). To confirm whether a similar trajectory of development extends beyond the first-grade word list, additional analyses were used to

compare RtW-F, RtW-U, and Spelling scores on the second and third-grade word lists. Descriptive data for these three scores for the second and third-grade word lists for the high-readiness group are shown in Table 13 and for the average-readiness group in Table 14.

For the high group, RtW-F remained higher than Spelling across all time points for the second and third-grade word lists. This is the same pattern identified for the high group on the first-grade word list. As students in the high group approached frustration in spelling words on the third-grade word list (as evidenced by mean scores below 50%), the difference between their scores on RtW-F and Spelling increased (RtW-F was 30% higher at EOY). For the average group, RtW-F was higher than Spelling at the EOY for the second-grade word list and at both MOY and EOY for the third-grade word list. The difference between these two scores was relatively small with the exception of the EOY score on third-grade word list (RtW-F was 20% higher). As students in the average group were asked to spell words containing orthographic features that had not yet been the focus of their first-grade spelling instruction, their word-reading skill (both decoding and automatic word recognition) outpaced their spelling skill.

Given the second and third-grade lists, students in both the average and high groups were able to read with automaticity more words than they were able to spell correctly across all time points, even as they approached a level of frustration on one or both tasks. This pattern of development stands in contrast to the pattern of development observed in the low-readiness group where skill in spelling words outpaced skill in reading the same words with automaticity.

**Table 13**

*Post-hoc Analysis of Comparisons of Words Correct on Read the Words (RtW-F and RtW-U)*

*and Spelling for High-Readiness Group on 2nd and 3rd Grade Word Lists*

| Time | Measures | | | | | | |
|---|---|---|---|---|---|---|---|
| | | RtW-F | | RtW-U | | Spelling | |
| | *N* | *M* | *(SD)* | *M* | *(SD)* | *M* | *(SD)* |
| | | | 2nd Grade Word List | | | | |
| BOY | 28 | 6.04 | *(3.49)* | 7.93 | *(3.42)* | 3.86 | *(2.94)* |
| MOY | 28 | 8.64 | *(1.25)* | 9.50 | *(0.88)* | 5.82 | *(2.57)* |
| EOY | 27 | 9.48 | *(1.05)* | 9.93 | *(0.27)* | 7.41 | *(2.17)* |
| | | | 3rd Grade Word List | | | | |
| BOY | 28 | 4.04 | *(4.02)* | 5.71 | *(4.13)* | 1.30 | *(2.38)* |
| MOY | 28 | 8.25 | *(1.58)* | 9.46 | *(1.00)* | 3.39 | *(2.78)* |
| EOY | 27 | 8.71 | *(2.17)* | 9.50 | *(1.90)* | 5.75 | *(2.74)* |

*Note.* All measures are expressed as the average number of words correct on the first-grade

word list. RtW-F = Read the words flash presentation, RtW-U = Read the words untimed

presentation, BOY = beginning-of-year data point (October), MOY = mid-year data point

(January-February), and EOY = end-of-year data point (April-May).

**Table 14**

*Post-hoc Analysis of Comparisons of Words Correct on Read the Words (RtW-F and RtW-U) and Spelling for Average-Readiness Group on 2nd and 3rd Grade Word Lists*

| Time | | RtW-F | | RtW-U | | Spelling | |
|---|---|---|---|---|---|---|---|
| Measures | | | | | | | |
| | *N* | *M* | *(SD)* | *M* | *(SD)* | *M* | *(SD)* |
| 2nd Grade Word List | | | | | | | |
| BOY | -- | -- | | -- | | -- | |
| MOY | 28 | 2.96 | *(3.01)* | 4.96 | *(3.81)* | 3.39 | *(1.86)* |
| EOY | 28 | 5.82 | *(2.76)* | 8.90 | *(2.60)* | 5.57 | *(2.23)* |
| 3rd Grade Word List | | | | | | | |
| BOY | -- | -- | | -- | | -- | |
| MOY | 11 | 2.80 | *(2.53)* | 5.60 | *(3.60)* | 1.55 | *(1.37)* |
| EOY | 21 | 5.00 | *(3.28)* | 8.38 | *(2.26)* | 2.90 | *(2.59)* |

*Note.* Spelling = average number of words correct on the first-grade word list. RtW-F = Read the words flash presentation, RtW-U = Read the words untimed presentation, BOY = beginning-of-year data point (October), MOY = mid-year data point (January-February), and EOY = end-of-year data point (April-May).

### Student Examples of Spelling and Word-Reading on Graded Word Lists

The trajectory of spelling and word-reading development differed across the three reading-readiness groups described in this study. The low-readiness group followed a different pattern from the other two groups because their spelling remained beyond their automatic word-reading at every time point. To examine spelling data from a developmental perspective (Bear et al., 2012), examples of spelling errors are presented alongside word-reading data for four students. Student samples were selected to represent the developmental trajectory observed for each reading-readiness group; that is, the pattern of development observed in each student sample is representative of the group data for RtW-F, RtW-U, and

Spelling. Students A and B are from the low reading-readiness group. Student C is from the average reading-readiness group and Student D is from the high reading-readiness group. Words included on each of the graded word lists are provided in Appendix I.

**Student A.** This student was selected from the bottom 50% of the low reading-readiness group, a percentile based on WR-T score at BOY. Student A's spelling errors and word-reading data on the first-grade word list are provided in Figure 5. At BOY, Student A spelled four out of ten words correctly, but could not read any of the ten words with automaticity. A qualitative look at Student A's spelling reveals interesting information about their developing orthographic knowledge. At BOY, they correctly represented most blends and digraphs (e.g., "ck" in sock; "st" in nest) and represented all short vowel sounds appropriately. By MOY, Student A began to experiment with using a silent-e long vowel marker in the words "side" and "flat." It is evident that they learned about sure of how to use it appropriately. At EOY, Student A's spelling reflects a command of all initial, final, and medial sounds, as well as many orthographic features on the first-grade word list (i.e., blends, digraphs, and some silent-e vowel markers) – insights that suggest this student is working within the late *letter-name alphabetic stage* of spelling development (Bear et al. 2012). Student A correctly spelled 70% of the words at EOY, but read only one of these same words with automaticity (see Figure 5).

**Figure 5**

*Student A's Spelling, Read the Words Flash, and Read the Words Untimed Comparisons*



*Note.* A yellow star indicates that the student read the word automatically during the flash presentation of the Read the Words task (RtW-F). A white star indicates that the student was able to correctly decode the word during the untimed presentation (RtW-U) on the same task.

**Student B.** Student B was selected from the top 50% of students in the low reading-readiness group, a percentile based on WR-T score at BOY. Their spelling errors and word-reading data are provided in Figure 6. At BOY, Student B was able to correctly spell five of the words on the first-grade list, including words that contained digraphs (e.g., "sh" in dish, "ch" in sock) and blends (e.g., "fl" in flat, "st" in nest). However, at the same time point, Student B could decode only three of these same words and could read none of them with automaticity. At MOY, Student B was able to read three words with automaticity - words

that the student also spelled correctly at this time point. Their knowledge of spelling long vowel patterns emerged at EOY, as evidenced by their correct use of the silent-e long vowel marker in words like "plane" and "drive." Interestingly, they could not read either of these words with automaticity. At EOY, Student B correctly spelled 100% of the words on the first-grade list, demonstrating their mastery of the orthographic features needed to spell words at this level; however, they read fewer than half of these same words with automaticity (see Figure 6). Student B's accurate representation of blends, digraphs, preconsonantal nasal sounds, and silent-e vowel markers places them within the *within-word stage* of spelling development (Bear et al. 2012).

**Figure 6**

*Student B's Spelling, Read the Words Flash, and Read the Words Untimed Comparisons*



*Note.* A yellow star indicates that the student read the word automatically during the flash presentation of the Read the Words task (RtW-F). A white star indicates that the student was able to correctly decode the word during the untimed presentation (RtW-U) on the same task.

**Student C.** Student C was selected as a representative sample from the average reading-readiness group. Their spelling errors and word-reading data are provided in Figure 7. Spelling is provided for BOY, but word-reading data was not available as this student was not administered the Read the Words task beyond the first-grade word list at this time point due to reaching frustration at the first-grade level. At MOY on the second-grade list, Student C correctly spelled five words and read with automaticity three of these same words. They correctly represented many orthographic features found on the second-grade list, including

blends and digraphs (e.g., "tr" in train, "sh" in shout), and common long vowel patterns (e.g., r-controlled vowel in short, "oo" vowel team in pool). By EOY, Student C correctly spelled 90% of the words on the second-grade list, demonstrating mastery of the orthographic patterns needed to spell words at this level; their automaticity in reading these same words follows suit.

Given the third-grade word list, Student C was unable to progress beyond the second-grade words for the Spelling task at BOY and for the Read the Words task at both BOY and MOY. However, Student C was administered both tasks on the third-grade list at the EOY. Data from EOY indicates that Student C was at their frustrational level for both spelling and word-reading on the third-grade word list. They were able to correctly spell and read with automaticity one word, though not the same word (see Figure 7). This student showed difficulty in representing some long vowel patterns in single-syllable words (e.g., "oa" vowel team in soap, "ea" vowel team in scream, and "oi" vowel team in voice), as well as issues at syllable junctures (e.g., doubling the final consonant in the first syllable of stepping). Collectively, Student C's EOY spelling data suggests they are working within the *within-word stage* of spelling development (Bear et al. 2012).

**Figure 7**

*Student C's Spelling, Read the Words Flash, and Read the Words Untimed Comparisons*



| BOY – 2nd, Form A | MOY – 2nd, Form B | EOY – 2nd, Form A |
|---|---|---|
| 1. chane | 1. trane | 1. chain ★ |
| 2. thick | 2. stic ☆ | 2. thick ★ |
| 3. chrode | 3. chase ☆ | 3. trade ★ |
| 4. dves | 4. grass ★ | 4. dres ★ |
| 5. siepe | 5. clene | 5. sleep ★ |
| 6. clowd | 6. shout ★ | 6. cloud |
| 7. stoorm | 7. short ☆ | 7. storm ☆ |
| 8. shoping | 8. droping ☆ | 8. shoping ★ |
| 9. cwool | 9. pool ★ | 9. cool ★ |
| 10. stuf | 10. spel ★ | 10. stuffe ★ |

| BOY – 3rd | MOY – 3rd, Form B | EOY – 3rd, Form A |
|---|---|---|
| The 3rd grade list was not administered to Student D at BOY due to reaching frustration on the 2nd grade list. | 1. rele | 1. sope ☆ |
| | 2. nee | 2. knif ☆ |
| | 3. sdrol | 3. screme ☆ |
| | 4. dolr | 4. bater ☆ |
| | 5. find | 5. miand ★ |
| | 6. mouth | 6. count ☆ |
| | 7. nos | 7. vors |
| | 8. yoosfl | 8. caieful ☆ |
| | 9. triping | 9. steping |
| | 10. camp fire | 10. basball ☆ |

*Note.* A yellow star indicates that the student read the word automatically during the flash presentation of the Read the Words task (RtW-F). A white star indicates that the student was able to correctly decode the word during the untimed presentation (RtW-U) on the same task.

**Student D.** Student D was selected as a representative example from the high reading-readiness group. At all time points for both the second and third-grade word lists, Student D's automatic word-reading skill was higher than their spelling skill at the same level. The differences in these two scores were most prominent on the third-grade list where Student D read three more words than they spelled at BOY, five more words at MOY, and two more words at EOY (see Figure 8). This student never experienced frustration in reading words at the second or third-grade level, but did score below 50% on spelling these same words at BOY and MOY. Despite the lower spelling scores, Student D's orthographic knowledge extends beyond the scope of a first-grade spelling curriculum as evidenced by their use of low-frequency vowel patterns (e.g., "aw" in straw, "oi" in noise, and "ou" in mouth), consonant clusters (e.g., "str" in straw), and increasingly sophisticated attempts at spelling multisyllabic words (e.g., useful, campfire). Taken together, Student D's spelling places them in the earliest stage of the *syllable juncture stage* of spelling development (Bear et al., 2012).

**Figure 8**

*Student D's Spelling, Read the Words Flash, and Read the Words Untimed Comparison*



*Note.* A yellow star indicates that the student read the word automatically during the flash presentation of the Read the Words task (RtW-F). A white star indicates that the student was able to correctly decode the word during the untimed presentation (RtW-U) on the same task.

**Summary**

This study sought to assess the reading and spelling development of first graders in an instructional context that prioritized explicit, systematic phonics instruction. There were three important findings from this study. First, differences in automatic word recognition and oral contextual reading were evident across the three reading-readiness groups (low-, average-, and high-readiness at the start of first grade). Second, across these three groups, children represented many of the same orthographic features in their spellings of words when given a grade-level word list, but showed greater variation in automatic word recognition and contextual reading skill. Third, for students in the low-reading readiness group, the discrepancy between reading words and spelling words was more pronounced than for the two other groups; that is, students in the low group were able to spell words that they could not read with automaticity. For students in the average- and high-reading readiness groups, spelling skill and word-reading skill were more closely aligned.

**Chapter Five**

**Discussion**

The purpose of this study was to examine the literacy development of first graders learning to read and spell in a specific instructional context; that is, one that prioritized explicit, systematic phonics instruction. In this study, phonics instruction consumed an average of 40% of the total literacy instructional time per day across the six participating classrooms. Instructional context is important to consider alongside an examination of children's literacy development. Widely accepted theories of reading and spelling development (Adams, 1990; Chall, 1983; Ehri, 1998; E. Henderson, 1981; Morris et al., 2003) were conducted prior to the National Reading Panel report (NRP; 2000), which established the essential role of systematic phonics instruction in early literacy instruction. Since the publication of this report, studies have documented the effects of phonics instruction in the early grades, though primarily through comparison studies of instructional methods and interventions. The present study did not seek to compare phonics instructional methods, but rather, to capture reading and spelling development within the context of the existing literacy instruction prevalent in the participating classrooms.

To this end, this study asked the following question: How do reading and spelling develop in first graders receiving a minimum of 40 minutes daily mandated phonics curriculum? Eighty-nine first grade students were administered word recognition, contextual reading, and spelling assessments at three time points across a school year. The literacy instruction offered in each of the participating classrooms was documented through observations and teacher questionnaires. This chapter includes a discussion of the main

findings, limitations of the study, and a discussion of the implications and future research directions.

Data from this study captured the word recognition, contextual reading, and spelling development of first-grade students and examined the relationship between these skills as they developed. The major findings are organized to address areas of literacy development in turn.

**How Does Reading Develop?**

*Word Recognition in Isolation*

Word recognition data from this study yielded an important finding regarding the differences between reading-readiness groups (low-, average-, and high-reading readiness at the start of first grade). The growth rate in word recognition (captured by WR-t) across the year was similar for students in the average- and high-readiness groups, but was much slower for students identified as low-reading readiness at the start of first grade. By the end of the school year, students in the average-readiness group were able to read twice as many words as their peers in the low-readiness group. These findings correspond to the findings from Morris and Perney (2018) on the same task. In their study, first grade word recognition-timed scores of 20 (BOY), 38 (MOY), and 49 (EOY) were reported as having strong, positive correlations with reading rate. It is important to note here that, on average, the low-readiness readers in this study never attained the minimum word recognition scores that Morris and Perney (2018) demonstrated as predictive of fluent reading.

*Oral Contextual Reading*

Group differences in contextual oral reading (as captured by reading accuracy and reading rate) lend support to existing research establishing the role of word-level

automaticity in reading connected text for meaning (Adams, 1990; Morris et al., 2011).

Consistent with previous research that suggests that increases in word recognition skill

correlate with growth in reading skill for beginning readers (Ehri, 1995; Perfetti, 1992;

Morris et al., 2012; Morris et al., 2017), students with greater word recognition scores read

more accurately and fluently on oral passage reading tasks.

**How Does Spelling Develop?**

For the first graders in this study, spelling skill was relatively sophisticated given the

developmental spelling trajectory suggested by a number of researchers. (Bear et al., 2012; E.

Henderson, 1985; E. Henderson & Templeton, 1986). At the onset of the study, students'

spelling evidenced complete connections between letters and their corresponding sounds and

few students spelled a word without including at least a beginning and ending consonant

sound with a vowel between them. Given the first-grade word list (see Appendix C), most

short vowels were correctly represented at the start of the school year and blends, digraphs,

and silent-e long vowel markers were correctly represented by the end of the year.

**How Do Reading and Spelling Develop in Relation to one Another?**

Findings from this study added nuance to the idea that reading and spelling skill are

reciprocal skills that develop in tandem and rely on a shared knowledge of words (Adams,

1990; Ehri, 1998; Morris & Perney, 1984; Morris et al., 2003; Perfetti, 1997). In this study,

children who were similar in spelling skill given a grade-level word list (i.e., they represented

many of the same orthographic features in their spellings of words) were vastly different in

word recognition and contextual reading skill. Existing developmental theories suggest that

spelling provides a window into children's developing word knowledge and studies have

hypothesized that reading and spelling are manifestations of the same underlying knowledge

of the alphabetic system (Ehri, 1998; E. Henderson, 1985); however, for the low readiness-readers in this study, spelling skill did not reflect word-reading skill in its entirety. For students in the low group, decoding skill (as measured by RtW-F, an untimed word recognition task) was greater than spelling skill, and spelling skill was greater than automatic word recognition skill (as measured by RtW-F, a timed word recognition task) on the grade-level word list. These students could spell and decode words that they could not recognize with automaticity. Given this finding, spelling may provide a better window into decoding skill for children identified as low readiness-readers, than as an indicator of sight word knowledge. For students in the average and high reading-readiness groups, spelling skill does seem to provide insight into both decoding and automaticity when students are asked to spell words containing orthographic features that extend beyond the scope of a first-grade phonics curriculum.

Contrary to what Morris and Perney (1984) suggested, spelling was not a reliable indicator of overall reading skill for the students in this study who were receiving the largest portion of their ELA instruction devoted to phonics. The low levels of automatic word recognition skill, yet comparatively stronger spelling and word-level decoding skills, particularly for students in the low-readiness group, suggest that this specific instructional context may have contributed more to growth in spelling and decoding. This finding validates the findings of Suggate's (2016) meta-analysis of the long-term effects of various interventions, which found that phonics contributed more to growth in spelling than reading. Additionally, the findings of this study complement the currently accepted theories of reading and spelling development, while at the same time adding more nuance to these theories that posit that these two skills develop reciprocally (Ehri, 1997; E. Henderson, 1992;

Morris & Perney, 1984; Perfetti, 1997). More specifically, it is plausible that this instructional environment reveals subtle distinctions in the developmental trajectory for children identified as low-readiness readers at the start of first grade. Although they were correctly representing many orthographic features in their spellings of words early on in the school year, students in the low-readiness group showed very slow progress in increasing automatic recognition of words, a development that is necessary to make progress in reading (Ehri, 1998; Perfetti, 1985; 1992). Researchers have advised that reading experiences directly facilitate the development of automatic word recognition (Adams, 1990; Ehri, 1997; E. Henderson, 1981; Morris et al., 2003; Share, 1995). The instructional context captured in this study provided a heavy emphasis on phonics instruction separate from contextual reading experiences, an instructional environment that may have caused the slower acquisition of sight words for the children identified as low readiness-readers. In contrast, this instructional context did not yield the same developmental sequence for children in the average and high-reading readiness groups. For these children, automaticity in reading words outpaced the spelling of these same words.

**Limitations**

There are six major limitations of the present study. First, the results are limited to the students in this study who are situated in the instructional contexts of their classrooms. The instructional context was documented through observations and self-reported data of classroom instructional practices on a select number of days and may not have been representative of all the literacy instruction that occurred in the classroom across the full year. Additionally, factors beyond instructional methods, materials, and quantity of instruction can influence first-grade students' reading and spelling development. These other

factors include prior early literacy experiences, motivation, background knowledge, and content knowledge (see Cervetti & Hiebert, 2015; Strickland & Riley-Ayers, 2006). Future research should consider both individual factors and the instructional environment in an examination of first graders' literacy development.

A second limitation was that the study recruited samples from six classrooms located in one school district in one rural area. Therefore, the results may not be representative of the overall effects of phonics programs in the United States. A different sample of teachers might yield different results. The six teachers who volunteered to participate in this study may be more alike in their instructional practices than those who did not consent. Additionally, one of the participating classrooms was designated for students in need of reading intervention after their kindergarten year. All students in this classroom were identified as below-grade level in reading at the start of first grade. Thus, there may be a disproportionately larger number of students identified as low-readiness readers in this study than would be found in a different population. Future research should include a more diverse sample of participants, including classrooms that are not part of the same school system and using the same phonics curriculum.

A third limitation was that the study had a small sample of first-grade students ($N =$ 89). Analyzing students in their respective reading-readiness groups led to even smaller sample sizes for each group ($n = 31, 30, 29$, respectively). Hedges's $g$ statistic was used to correct for the small sample size of each group in effect size comparisons. It is possible that a larger sample of students would have produced different results. Future research should include a greater number of student participants so that group comparisons can be made with larger sample sizes.

A fourth limitation was that the method for assessing students may have led to possible practice effects. That is, two versions (forms A and B) were alternated across time points and across participants, but each participant received one of the forms twice across the school year. Moreover, there was a significant snowstorm during the second data collection period that required the researcher to halt all data collection due to school closures. One-third of the students had already been assessed at the time of the interruption, but, due to the extended closure followed by the school system's scheduled winter break, the researcher re-assessed these students during a rescheduled second data collection period one month later. Therefore, to avoid the same form being used only one month apart, one third of the students received the same form during the first and second data collection periods. Future research studies investigating early literacy development in a similar instructional context should utilize different versions of assessment tasks at each time point to eliminate the potential for practice effects.

A fifth limitation was that the spelling task had a ceiling effect in which many students achieved a maximum score when spelling was analyzed using a developmental scoring system. The qualitative spelling system used in this system was not sensitive enough to capture the nuances in spelling skill across the participants in this study. More variability in the spelling task is needed to capture the gradations of first graders' developing orthographic knowledge given this particular instructional context. Specifically, using a single spelling measure representing multiple levels of words, rather than graded-word lists, and with a ceiling that is responsive to varied levels of spelling development may have resulted in a more nuanced understanding of spelling across the three levels of readers in this study. Such a tool may be more accurate for making comparisons of spelling knowledge

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across different levels of readers. Future researchers might consider using a single measure representing multiple levels of words, such as the *Words Their Way Developmental Spelling Inventory* (Bear et al., 2012), in future studies that look at first graders' spelling development.

A sixth limitation was that all students were not administered grade-level passages at each time point. At the beginning of the year, all students read the Preprimer 2 passage, which was the earliest level included in the assessment battery. If students achieved frustration-level criteria, administration was discontinued. Students were not asked to read passages beyond their frustration level. Therefore, the oral passage reading data at the middle of the year and end of the year is only representative of the students who were able to attempt grade-level passages, further reducing group sample sizes. Future research should include a minimum one-minute reading of grade-level passages so all students' reading skill can be compared at all time points.

**Implications and Future Research**

Results of this study have implications for our understanding of how beginning reading and spelling develop in this specific instructional context. Existing theories of early literacy development suggest that reading words outperforms spelling words, and as such, we expect to see this pattern of development play out in children learning to read and spell. However, data in this study shows a different trajectory for the development of these two skills. In the present study, students identified as low-readiness readers at the start of first grade were consistently able to spell words correctly that they could not read with automaticity. At the same time, data from the students identified as high-readiness readers showed the opposite pattern of development, where automaticity in reading words was more developed than their spelling of the same words. It is possible that the instructional factors

specific to the context of this study complicate the theoretical assumption that children can read words before they can spell them. Despite the uniformity of the mandated phonics curriculum offered in the classrooms in this study, there were differences in development between the reading-readiness groups. Students across the three reading-readiness groups were more similar in spelling skill than they were in automatic word recognition skill.

The theories of early reading and spelling development that undergird this study are the same theories that are foundational in preparing teachers to teach literacy in the early grades. Given the findings of this study, teacher educators should consider that for some groups of students in the early grades, automatic word recognition and spelling development may not align with the theoretical assumptions we have about the development of these two skills. Teachers in the early grades must also be aware of this potential deviation from the expected developmental trajectory and look at their students specifically. Given the possible differences for students at different levels of reading-readiness, the role of assessment becomes critical in guiding teachers to identify disparities in their students' development. If teachers only measure word recognition development, other aspects of their students' development will be disregarded; likewise, if they only measure spelling development, group differences will be overlooked. Assessing skills in only one area will not provide a full picture of development for all students.

The findings of the present study are only a start to understanding how children's reading and spelling develop in the context of explicit, systematic phonics instruction. More research is needed to begin to understand the role of such instruction on these two skills. For example, does explicit phonics instruction inherently provide more support for increasing spelling skill, decoding skill, or automatic word recognition? The findings of this study

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showed that decoding and spelling skill were more advanced than word recognition skill, specifically for students in the low-readiness and average-readiness groups. Though phonics programs are often marketed as complete reading programs, the heavy emphasis on explicit phonics instruction in the participating classrooms may have contributed more to growth in spelling and decoding skills than word recognition and contextual reading skills. In the same way that researchers found that first graders' word-reading development was influenced by instruction nearly 40 years ago (Barr, 1974-1975; A. Cohen, 1974-1975), students in this study may have been more practiced in the individual processing of letters in words, rather than in recognizing words as whole units that are eventually read by sight. Future research investigating the influence of this specific instructional context on early word recognition and spelling development is needed to begin to parse out the role of instruction on group differences in development. Because the spelling data in this study evidenced that students entered first grade with relatively advanced spelling skills given their word recognition skills, replicating this study with kindergarten students may capture the earlier stages of spelling development as they occur.

One area of early literacy development that this study did not address is the role of phonemic awareness alongside reading and spelling development. Findings (Morris et al. 2003; Perfetti et al., 1987) suggest that reading and spelling development may be influenced by students' levels of phonemic knowledge– specifically, phonemic awareness skills that are analytic versus those that require only surface knowledge. Capturing students' ability in varying levels of phonemic skills alongside reading and spelling development may provide more insight about the relationship between decoding, spelling, and word recognition. For

example, do surface-level phonemic skills promote decoding and spelling skills, while analytical phonemic skills support a deeper word knowledge necessary for automaticity?

Studies that document the quantity and quality of various components of the literacy block alongside students' development are needed. In this study, the emphasis on explicit phonics instruction (40% of the literacy block) led to reduced time for other essential components, including contextual reading practice (11%) and writing opportunities (12%). The essential role of phonics instruction for beginning readers is uncontested in this study; however, phonics alone may not be sufficient for developing beginning readers into more skilled readers. We must use caution when viewing the skill of reading as a "sum total of discrete processes, whereby instruction in one weak area will magically improve students' reading achievement" (Gambrell et al., 2011). Phonics instruction should occur alongside other essential instructional components (NRP, 2000). A comprehensive framework is one that recognizes that comprehension is the ultimate goal of literacy instruction, and in doing so, instruction must emphasize both skill instruction and meaning-making (Gambrell et al., 2011; International Literacy Association, 2019b). In the early grades, such a framework includes opportunities for students to apply their developing literacy skills in the context of authentic contextual reading and writing experiences (Allington, 2002; Block et al., 2009).

Castles et al. (2018) has pushed further the idea of a balanced approach, suggesting that the term "balanced instruction" must be illuminated in a way that provides more nuance to its intended meaning and that is guided by an understanding of how reading develops across time. In the same way, other researchers have suggested that offering effective literacy instruction is more complex than simply including all of the parts that create the more balanced whole (Rasinski & Padak, 2004). The relationships between the different

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components of literacy instruction must be considered. For example, it is critical for teachers to understand how the application of phonics knowledge in contextual experiences is supportive of continued development of phonics skills, and that authentic reading experiences will further support developing word knowledge. A narrow focus on decoding skills separate from other components of literacy instruction is believed to contribute to the knowledge gap that leads to future difficulties in reading (International Literacy Association, 2019b). Future research that clarifies what such a balance should look like in early grades classrooms will be important for helping teachers make decisions about their literacy instruction.

The findings of this study suggest that more inquiry into the role of instruction in developing first graders' automatic word recognition is needed. The importance of developing automaticity in reading words has long been established (Ehri, 1995, 1998; LaBerge & Samuels, 1974; Perfetti, 1985, 1992), but the question of how this theoretical understanding is translated into practice warrants further investigation. Research on effective instructional practices for developing automaticity in the early grades is needed so that teachers can integrate instructional practices that develop phonics knowledge, decoding skill, and automatic word recognition. Classroom literacy instruction that allots more time for phonics than contextual reading and writing may exacerbate the discrepancy between the automatic word recognition skills of students identified as low-readiness and that of their peers. In this study, students in the low-readiness group followed a similar developmental trajectory in automatic word recognition as their average-readiness peers, but the gap between the groups remained throughout the year. To catch up with their peers, low-

readiness readers will need even more opportunities to increase word recognition and contextual reading skill.

Finally, this dissertation is only one documentation of the reading and spelling development of students in an instructional context that emphasizes phonics instruction. Previous research on early reading and spelling development did not consider the instructional context. A shift in instructional practices that has occurred since the publication of the NRP (2000) report 20 years ago, and recent renewed public interest concerning the role of phonics instruction in the early grades, warrants further studies that consider instructional context alongside development. Additional studies are needed to examine whether this developmental trajectory occurs in other populations within a similar instructional context. More specifically, as a follow-up to the present study, a multi-year longitudinal study documenting the reading and spelling development for students identified as low-readiness readers would provide more insight about the long-term developmental trajectory for this particular group of students. Additionally, studies that account for students at varied levels of reading skill are needed to begin to tease out the role of instruction on children who are identified as low readiness-readers.

**Conclusion**

This dissertation examined the reading and spelling development of first-grade students receiving substantial systematic phonics instruction. Prior to this study, students had been anecdotally observed departing from the established developmental trajectories (see Chall, 1983; Ehri, 1998; E. Henderson, 1981; Morris et al., 2003) first identified in the 1980s before the publication of the NRP report which led to an increase in time allocated to explicit, systematic phonics instruction across the nation (NCEE, 2008). This study sought to

determine whether students' developmental trajectories aligned with these well-established theories within the context of heavy phonics instruction.

The major finding in this study was that students who were vastly different in their automatic recognition of words, were similar in their spelling skill given a grade-level word list. A pattern of development evident in this study was that students identified as low readiness-readers at the start of first grade were able to spell and decode words that they could not read with automaticity, a subtle refinement to current theories of early reading and spelling development if born out in larger studies. This study provides a more nuanced look at existing theories of early reading and spelling development as they play out in an instructional context that emphasizes phonics instruction, particularly for students who enter first grade with limited sight word knowledge. The findings of this study also support the role of automaticity in overall reading development as students with greater word recognition skill also displayed increased levels of contextual reading skill. As researchers continue to investigate the influence of literacy instructional contexts on early reading and spelling development, our understanding of effective literacy practices for developing automaticity, alongside decoding and spelling skill, may be improved.

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## Appendix A

## Classroom Instruction Data Sheet

How many years have you been teaching 1st grade? Have you taught other grades?

In general, what does language arts instruction look like in your classroom?

**Please provide a copy of your daily and/or weekly classroom schedule with this data sheet.**

**Reading Instruction**

How do you deliver reading instruction? (whole-group, small-group, one-on-one, etc.) Describe how you do this.

What materials do you use for reading instruction? Be specific.

About how much time is spent on reading instruction in a typical school day?

**Spelling Instruction**

How do you deliver spelling instruction? (whole-group, small-group, one-on-one, etc.)
Describe how you do this.

What materials do you use for spelling instruction? Be specific.

About how much time is spent on spelling instruction in a typical school day?

**Writing Instruction**

How do you deliver writing instruction? (whole-group, small-group, one-on-one, etc.)
Describe how you do this.

What materials do you use for writing instruction? Be specific.

About how much time is spent on writing instruction in a typical school day?

**Appendix B**

**Note-Taking Protocol for Classroom Observations**

Teacher Name:                                          Date of Observation:
Time arrived:          Time departed:          Total time observed:

| | |
|---|---|
| What language arts instruction is being taught? | |
| What instructional materials are being utilized? | |
| How are students arranged for instruction? | |
| What are students doing? | |

# Appendix C

## Spelling Task

## Form A

**FIRST GRADE - A**

| Word | Sentence | Student's Spelling |
|------|----------|--------------------|
| 1. pet | A kitten is a pet. | |
| 2. wish | make a wish | |
| 3. best | I like chocolate best. | |
| 4. hide | hide in the closet | |
| 5. trap | caught in a trap | |
| 6. rock | I threw the rock. | |
| 7. bump | We went over a bump. | |
| 8. drive | drive the car | |
| 9. plane | a plane up in the sky | |
| 10. chin | The dog licked my chin. | |

**If student misses 6 or more words on the first list, stop here.**

**SECOND GRADE - A**

| Word | Sentence | Student's Spelling |
|------|----------|--------------------|
| 1. chain | a chain fence | |
| 2. thick | a thick piece of wood | |
| 3. trade | Will you trade with me? | |
| 4. dress | a pretty dress | |
| 5. sleep | At night, I sleep. | |
| 6. cloud | a cloud in the sky | |
| 7. storm | It was a big storm. | |
| 8. shopping | I go shopping with mom. | |
| 9. cool | The weather is cool. | |
| 10. stuff | Put your stuff away. | |

**If student misses 6 or more words on the second list, stop here.**

**THIRD GRADE - A**

| Word | Sentence | Student's Spelling |
|---|---|---|
| 1. soap | I wash with soap. | |
| 2. knife | cut with a knife | |
| 3. scream | a baby's scream | |
| 4. batter | The batter hit the ball. | |
| 5. mind | What's on your mind? | |
| 6. count | count to 10 | |
| 7. voice | a loud voice | |
| 8. careful | be careful | |
| 9. stepping | stepping on the grass | |
| 10. baseball | I play baseball | |

# Spelling Task

## Form B

**FIRST GRADE - B**

| Word | Sentence | Student's Spelling |
|------|----------|-------------------|
| 1. wet | The dog is wet. | |
| 2. dish | a broken dish | |
| 3. nest | the bird's nest | |
| 4. side | on the side | |
| 5. flat | The rock is flat. | |
| 6. sock | I lost my sock. | |
| 7. junk | a box of junk | |
| 8. prize | I won a prize. | |
| 9. plate | I have food on my plate. | |
| 10. chip | I ate a potato chip. | |

**If student misses 6 or more words on the first list, stop here.**

**SECOND GRADE - B**

| Word | Sentence | Student's Spelling |
|------|----------|-------------------|
| 1. train | a loud train | |
| 2. stick | The dog has a stick. | |
| 3. chase | I play chase. | |
| 4. grass | The cat is in the grass. | |
| 5. clean | My room is clean. | |
| 6. shout | Do not shout. | |
| 7. short | The boy is short. | |
| 8. dropping | I am dropping my toys. | |
| 9. pool | jump in the pool | |
| 10. spell | I can spell my name. | |

**If student misses 6 or more words on the second list, stop here.**

**THIRD GRADE - B**

| Word | Sentence | Student's Spelling |
|---|---|---|
| 1. real | a real animal | |
| 2. knee | I hit my knee. | |
| 3. straw | drink from the straw | |
| 4. dollar | a dollar bill | |
| 5. find | Did you find it? | |
| 6. mouth | close your mouth when you chew | |
| 7. noise | a loud noise | |
| 8. useful | a useful tool | |
| 9. tripping | tripping on the stairs | |
| 10. campfire | a smoky campfire | |

# Appendix D

## Developmental Spelling Scoring System for First Grade Spelling List

### Form A

| Form A | | 1 point | 2 points | 3 points | 4 points |
|---|---|---|---|---|---|
| List | Word | | | | |
| 1-1 | pet | p | pt | pat<br>ped | pet |
| 1-2 | wish | w, y | ws<br>wch | wesh<br>whesh<br>wih<br>whih<br>whis<br>whihs<br>with<br>wich | wish<br>whish<br>wiesh |
| 1-3 | best | b | bs | bas<br>bst<br>bast<br>bist<br>bect<br>bes<br>bets<br>besd | best |
| 1-4 | hide | h | hd<br>had | hed<br>hid<br>hit | hide<br>hiad<br>hied<br>hiede |
| 1-5 | trap | t, h, ch | tp<br>hp<br>chp<br>jap<br>hap | tap<br>rap<br>chap<br>thap<br>chrap | trp<br>trap<br>thrap<br>trape |
| 1-6 | rock | r | rk<br>rc | rik<br>ruc<br>rok<br>rog<br>roc<br>rook<br>roke<br>rock | rock<br>rock<br>rocke |

| | | | | | |
|---|---|---|---|---|---|
| 1-7 | bump | b | bp | bop<br>bub<br>bup<br>bum<br>boom | bomp<br>bunp<br>bummp<br>bumpe<br>bump |
| 1-8 | drive | d<br>j | daf<br>jv<br>jiv<br>jev<br>div<br>riv<br>jivd<br>chiv | grav<br>griv<br>dive<br>jrith<br>jrif<br>jriv<br>driv | dive<br>grive<br>trive<br>jrife<br>jrive<br>drive<br>driev |
| 1-9 | plane | p | pn<br>plen<br>pan | paen<br>plan | plane<br>plaen<br>plany<br>playn<br>plain |
| 1-10 | chin | c<br>t | tn<br>hn<br>jen<br>jin<br>chan<br>shen | cin<br>hin<br>chen<br>cine<br>chnu<br>ckin<br>thin<br>then<br>shin<br>hcen | chin |

# Developmental Spelling Scoring System for First Grade Spelling List

## Form B

| Form B | | 1 point | 2 points | 3 points | 4 points |
|---|---|---|---|---|---|
| List | Word | | | | |
| 1-1 | wet | w | wt | wat | wet |
| 1-2 | dish | d | ds<br>dch | dih<br>dis<br>dich<br>diss<br>desh | dish |
| 1-3 | nest | n | ns | nas<br>nat<br>net<br>nast<br>nesd<br>nets | nest |
| 1-4 | side | s | sd<br>sad | sid | side<br>sied<br>sidu |
| 1-5 | flat | f | ft<br>fit | fat | flat |
| 1-6 | sock | s | sk<br>sc | sik<br>sok<br>soc<br>sosk | sock<br>soock |
| 1-7 | junk | j | jc<br>jk<br>jck<br>guc<br>gog<br>jug | joc<br>jok<br>jock<br>juc<br>juk<br>guck<br>juck<br>dunk<br>jonck | junk<br>junc<br>junck<br>gonk<br>gunc<br>gunck |
| 1-8 | prize | p | ps<br>pz<br>pasz<br>pis<br>piz | pris<br>priss<br>prie<br>priz<br>pise<br>pize | prise<br>prize<br>priez<br>prisu<br>priys<br>prizu<br>price<br>prisze<br>pries |

| 1-9 | plate | p | pt<br>plet<br>pat | plat<br>pate | plate<br>plaet<br>playt<br>plait<br>plaet |
|-----|-------|---|-----|-----|-----|
| 1-10 | chip | c, t | tp<br>hp<br>jep<br>jip<br>top<br>cib<br>cep<br>chap | cip<br>ckip<br>thip<br>chep<br>cipe | chip |

**Appendix E**

**Read the Words Task (RtW-F & RtW-U)**

**Form A**

| First Grade | Second Grade | Third Grade |
|---|---|---|
| 1.  chin | 1.  stuff | 1.  baseball |
| 2.  drive | 2.  shopping | 2.  careful |
| 3.  rock | 3.  cloud | 3.  count |
| 4.  hide | 4.  dress | 4.  batter |
| 5.  wish | 5.  thick | 5.  knife |
| 6.  plane | 6.  cool | 6.  stepping |
| 7.  bump | 7.  storm | 7.  voice |
| 8.  trap | 8.  sleep | 8.  mind |
| 9.  best | 9.  trade | 9.  scream |
| 10.  pet | 10.  chain | 10.  soap |

**Read the Words Task (RtW-F & RtW-U)**

**Form B**

| First Grade | Second Grade | Third Grade |
|---|---|---|
| 1. chip | 1. spell | 1. campfire |
| 2. prize | 2. dropping | 2. useful |
| 3. sock | 3. shout | 3. mouth |
| 4. side | 4. grass | 4. dollar |
| 5. dish | 5. stick | 5. knee |
| 6. plate | 6. pool | 6. tripping |
| 7. junk | 7. short | 7. noise |
| 8. flat | 8. clean | 8. find |
| 9. nest | 9. chase | 9. straw |
| 10. wet | 10. train | 10. real |

**Word Recognition-Timed Task (WR-T)**

**Form A**

| | | | | | |
|---|---|---|---|---|---|
| is | cat | my | good | come | and |
| up | play | big | are | from | old |
| little | where | hide | cut | bad | new |
| need | made | eat | find | does | back |
| two | men | white | push | feed | again |
| table | class | stand | cloud | leave | into |
| happy | school | them | window | tail | isn't |
| part | children | drove | above | dug | gate |
| flew | change | wash | person | north | blanket |
| melt | asleep | dollar | blow | kept | giant |

| explain | coin | shade | office | straight | pillow |
| robber | finish | slide | print | soup | wing |
| prize | shoot | travel | spoon | toward | stomach |
| pool | vegetable | seal | accept | legend | slipper |
| dresser | customer | plop | further | closet | storyteller |

*Note.* From *Morris Informal Reading Inventory* by D. Morris, Copyright 2015.

## Word Recognition-Timed Task (WR-T)

### Form B

| | | | | | |
|---|---|---|---|---|---|
| it | dog | me | not | came | said |
| go | like | by | out | for | your |
| thing | who | here | sun | pat | saw |
| feet | hid | lake | bird | about | rain |
| one | leg | black | hurt | seen | until |
| winter | glass | shout | gold | head | how |
| mother | water | that's | people | paint | couldn't |
| dark | because | smile | able | pull | week |
| felt | break | rush | third | perfect | basket |
| wrote | short | taken | spill | hospital | crayon |

| against | early | curl | bring | leap | heavy |
| --- | --- | --- | --- | --- | --- |
| explore | mouth | shadow | plain | tight | parade |
| threw | forget | smart | raise | stood | roof |
| runner | wild | favor | buffalo | receive | haircut |
| icy | thread | bandage | moat | unroll | yarn |

*Note.* From *Morris Informal Reading Inventory* by D. Morris, Copyright 2015.

# Appendix G

# Oral Passage Reading Task

# Preprimer Examiner Copy, Form A

PREPRIMER 2                    FORM A (100 words)                    "Fishing"

**Examiner's Introduction:** *This story is about a fishing trip.*

"I'm going fishing," said Father Bear. "I like fishing, too," said Baby Bear.

"I will go with you and help you."

"You are too little to go fishing," said Mother Bear. "I am **not** too little," said Baby Bear. "I'm big."

Father Bear and Baby bear went down to the river.

"Come here, fish," said Baby Bear.

"The fish are not coming today," said Father Bear.

Baby Bear went on fishing.

"Look!" shouted Baby Bear. "Fish! Fish! Look at my fish!"

Father Bear and Baby Bear went home with the fish.

                              100
"Look at my fish! said Baby Bear. "I'm not/too little to go fishing."

_____

**Questions**

1. What did Father Bear and Baby Bear do? *(They went fishing.)*

2. Who caught the fish? *(Baby Bear.)*

3. When Father Bear said "the fish are not coming today," what did he mean? *(There were no fish in in the river.)*

4. What happened at the end of the story? *(They went home with the fish.*)

**# of seconds to read passage: _____**

**# of errors: _____**

**If the child makes more than 10 errors OR**
**if the child takes longer than 200 seconds to read this passage,**
**STOP. DO NOT administer any more passages.**

| Errors | |
|---|---|
| Accuracy | |
| Rate (6,000/# sec) | |
| Comprehension | |

146

# Oral Passage Reading Task

# Preprimer Examiner Copy, Form B

PREPRIMER 2                    FORM B (100 words)                    "Little Bulldozer"

**Examiner's Introduction:** *This story is about a little bulldozer [point to picture].*

Little bulldozer went to look at a fire engine.

"Hello, fire engine," said Little Bulldozer.

"I like helping. I will help you."

"Go away. Go away," said the fire engine.

"I'm going to a fire. You are too little to help at a fire. Go away."

Little Bulldozer went away. He went to look at a big truck.

"Hello, Big Truck," he said. "I like helping. I will help you."

"Go away, Little Bulldozer," said the big truck.

"You are too little to help me. Go away and play."

Little Bulldozer went away. He cried and cried.

              100
"I'm too little,"/he said.

_____

## Questions

1. What did Little Bulldozer want to do? *(He wanted to help.)*

2. Who did Little Bulldozer want to help? *(Fire Engine, Big Truck, Bulldozer [need two]).*

3. What did they say to Little Bulldozer? *(You are too little to help.* or *Go away.)*

4. What happened at the end of the story? *(Little Bulldozer cried.* or *He went away.)*

**# of <u>seconds</u> to read passage: _____**

**# of errors: _____**

**If the child makes more than 10 errors <u>OR</u>**
**if the child takes longer than 200 seconds to read this passage,**
**STOP. DO NOT administer any more passages.**

| Errors | |
|---|---|
| Accuracy | |
| Rate (6,000/# sec) | |
| Comprehension | |

# Oral Passage Reading Task

## Primer Examiner Copy, Form A

PRIMER                    FORM A (100 words)                    "Clouds"

**Examiner's Introduction:** *This story is about two mice who are looking up at the sky.*

"Look!" said. Mother. "We can see pictures in the clouds."

The little mouse and his mother saw many pictures in the clouds.

They saw a castle . . . a rabbit . . . a mouse.

"I am going to pick flowers," said Mother.

"I will stay here and watch the clouds," said the little mouse.

The little mouse saw a big cloud in the sky. It grew bigger and bigger.

The cloud became a cat. The cat came nearer and nearer to the little mouse.

"Help!" shouted the little mouse, and he ran to his mother.

100
"There is a big cat in the sky!" cried/the little mouse.

---

**Questions**

1. What were the little mouse and his mother doing? *(Looking at the clouds.)*

2. What things did they see in the clouds? *(A castle, rabbit, mouse, and cat. [need two])*

3. Where did the mother mouse go? *(To pick flowers.)*

4. Why did the little mouse shout, "Help"? *(He thought he saw a big cat.)*

**# of seconds to read passage: _____**

**# of errors: _____**

**If the child makes more than 10 errors OR**
**if the child takes longer than 150 seconds to read this passage,**
**STOP. DO NOT administer any more passages.**

| Errors | |
|---|---|
| Accuracy | |
| Rate (6,000/# sec) | |
| Comprehension | |

# Oral Passage Reading Task

## Primer Examiner Copy, Form B

PRIMER                          FORM B (100 words)                          "Ben's Tooth"

**Examiner's Introduction:** *The title of this story is "Ben's Tooth."*

Ben was eating an apple at school.

"Ow!" he said. "Oh, look! My tooth has come out ... and here it is, in my apple!"

Ben went to show his teacher. "Look, Mrs. Green," he said.

"My tooth has come out."

"Here's a little box to put it in," said Mrs. Green.

Ben ran home after school and showed Mom.  "Look at me," he said.

"Where is your tooth?" said Mom. "Have you got it?"

"It's here," said Ben, "in this little box."

100

"Good," said Mom. "The tooth fairy may come and get it after you go to sleep.   Put it/by your bed.

_____

**Questions**

1. Where was Ben when his tooth came out?  *(At school.)*

2. How did the tooth come out? *(He was eating an apple.)*

3. What did Ben's teacher do for him? *(Gave him a little box to put it in.)*

4. What did Ben's mom tell him to do? *(Put it by his bed for the tooth fairy.)*

**# of <u>seconds</u> to read passage: _____**

**# of errors: _____**

**If the child makes more than 10 errors <u>OR</u>
if the child takes longer than 150 seconds to read this passage,
STOP. DO NOT administer any more passages.**

| Errors | |
|---|---|
| Accuracy | |
| Rate (6,000/# sec) | |
| Comprehension | |

# Oral Passage Reading Task

## Late-First Grade Examiner Copy, Form A

**Examiner's Introduction:** *This story is about two friends, Frog and Toad.*

One hot summer day Frog and Toad sat by the pond.

"I wish we had some sweet, cold ice cream," said Frog.

"What a good idea," said Toad.

"Wait right here, Frog. I will be back soon."

Toad went to the store. He bought two big ice-cream cones.

Toad licked one of the cones. "Frog likes chocolate best," said Toad, "and so do I."

Toad walked along the path. A large, soft drop of chocolate ice cream slipped down his arm.

"This ice cream is melting in the sun," said Toad.

                                        100
Toad walked faster. Many drops of melting ice cream/flew through the air.

---

**Questions**

1. What did Frog want on the hot summer day? *(Ice cream.)*

2. Where did Toad get the ice cream? *(At the store.)*

3. How much ice cream did Toad buy? *(Two cones.)*

4. What problem was Toad having at the end of the story?
*(The ice cream was melting.)*

    # of <u>seconds</u> to read passage: _____

    # of errors: _____

    **If the child makes more than 10 errors <u>OR</u>**
    **if the child takes longer than 120 seconds to read this passage,**
    **STOP. DO NOT administer any more passages.**

| Errors | |
|---|---|
| Accuracy | |
| Rate (6,000/# sec) | |
| Comprehension | |

# Oral Passage Reading Task

## Late-First Grade Examiner Copy, Form B

**LATE-FIRST GRADE**              **FORM B (100 words)**             **"Sledding"**

**Examiner's Introduction:** *This story is about Frog and Toad on a winter day.*

Frog and Toad went outside. They tramped through the snow.

"We will ride down this big hill on my sled," said Frog.

"Not me," said Toad.

"Do not be afraid," said Frog. "I will be with you on the sled.

"It will be a fine, fast ride. Toad, you sit in front. I will sit right behind you."

The sled began to move down the hill. "Here we go!" said Frog.

There was a bump. Frog fell off the sled.

Toad rushed past trees and rocks.

"Frog, I am glad that you are here," said Toad.

               100
Toad leaped over a/snowbank.

_____

**Questions**

1. What did Frog suggest that they do on the winter day? *(Ride down the hill on a sled.)*

2. How did Toad feel about sledding? *(He didn't want to: he was afraid.)*

3. Who was in the front, guiding the sled? *(Toad was in the front.)*

4. What happened as they were sledding down the hill?
*(Frog fell off the sled and Toad kept going.)*

    **# of <u>seconds</u> to read passage: _____**

    **# of errors: _____**

    **If the child makes more than 10 errors <u>OR</u>**
    **if the child takes longer than 120 seconds to read this passage,**
    **STOP. DO NOT administer any more passages.**

| | |
|---|---|
| **Errors** | |
| **Accuracy** | |
| **Rate** **(6,000/# sec)** | |
| **Comprehension** | |

151

# Oral Passage Reading Task

# Second Grade Examiner Copy, Form A

**SECOND GRADE**                    **FORM A (122 words)**                    **"Fox and the Grapes"**

**Examiner's Introduction:** *This story is about a hungry fox.*

One day, Fox was walking through a forest. It was late summer. He knew that berries and other fruits would now be ripe. Suddenly, Fox felt hungry. He looked up and saw a bunch of grapes on a high branch. Each grape looked red and plump.

"Those grapes look good," Fox said. So Fox jumped up to grab them, but the grapes were too high. Fox tried again. This time he took a running start. He jumped as high as he could. Still, he could not reach the grapes. Fox tried and tried. Each time he missed the grapes by inches.

Finally, Fox became tired. He decided he wasn't so hungry after all. He said, "I bet those grapes are sour anyway!"

---

**Questions**

1. At white time of year does this story take place? *(Spring [1/2]; Summer [full credit].)*

2. What was Fox trying to get? *(Grapes [1/2]; How did the grapes look? (ripe, red, or plump [1/2])*

3. How did Fox try to get the grapes? *(He jumped for them.)*

4. Why did Fox quit trying to get the grapes?
*(He became tired. or Grapes were too high for him to reach.)*

5. What did Fox tell himself at the end of the story?
*("I'm not really hungry." Or "Those grapes are probably sour.")*

**# of seconds to read passage: _____**

**# of errors: _____**

**If the child makes more than 12 errors OR
if the child takes longer than 146 seconds to read this passage,
STOP. DO NOT administer any more passages.**

| Errors | |
|---|---|
| Accuracy | |
| Rate (7,320/# sec) | |
| Comprehension | |

# Oral Passage Reading Task

## Second Grade Examiner Copy, Form B

**SECOND GRADE**                    **FORM B (126 words)**                    **"The Fox and the Crow"**

**Examiner's Introduction:** *This story is about a clever fox.*

One day, a crow stole a piece of cheese from a picnic table. Then she flew up into a tree. A fox saw the crow take the cheese. He wanted it for himself.

So the fox trotted over to the tree. He called out, "Good morning, Miss Crow. You look very lovely today. Your feathers are shiny and black! If your voice is as lovely as your feathers, then you must be a fine singer."

The crow enjoyed this praise very much. She forgot about the cheese. She opened her mouth to sing. The cheese fell to the ground, and the fox gobbled it up.

"Thank you very much," said the fox as he licked his lips. Then he trotted away feeling quite pleased with himself.

---

**Questions**

1. What happened first in this story? *(A crow stole a piece of cheese.)*

2. Why did the fox trot over to the crow? *(He wanted the cheese.)*

3. What did the fox say to the crow? *(That she had beautiful feathers and probably had a beautiful voice.)*

4. What caused the crow to drop the cheese?
*(She opened her mouth to sing.)*

5. Why was the fox pleased or happy at the end of the story?
*(He had gotten the cheese. Or He had tricked the crow.)*

**# of <u>seconds</u> to read passage: _____**

**# of errors: _____**

**If the child makes more than 13 errors <u>OR</u>**
**if the child takes longer than 151 seconds to read this passage,**
**STOP. DO NOT administer any more passages.**

| Errors | |
|---|---|
| Accuracy | |
| Rate (7,560/# sec) | |
| Comprehension | |

153

# Oral Passage Reading Task

# Third Grade Examiner Copy, Form A

**THIRD GRADE**                    **FORM A (147 words)**                    **"Maggie and the Goose"**

**Examiner's Introduction:** *This story is about a little girl and some animals.*

Maggie lived on a farm with lots of animals. She loved the cows, pigs, sheep, and chickens, but she did not like the geese. In fact, she was afraid of them. They were large, white birds with orange beaks. Whenever Maggie too close, the geese extended their wings and stretched out their necks toward her. Then they would rush at her making terrible honking and hissing sounds.

One warm afternoon, Maggie went into the barn to play. The light was dim in there, so she didn't see the geese until it was too late. One huge, upset goose ran toward Maggie and grabbed the seat of her shorts with its beak. Maggie turned and ran out of the barn yelling, but the angry goose did not let go. Maggie's parents got a good laugh watching her with that crazy goose before they finally helped her escape.

**Questions**

1. Where did the girl in this story live? *(On a farm.)*

2. Why didn't Maggie like the geese on her farm?
*(They chased her.* <u>or</u> *They hissed at her.* [full credit] *They scared her.* [1/2]; <u>Probe:</u> How did they scare her?)

3. What did the geese look like? *(Large white birds with orange beaks.)*

4. Where on the farm did Maggie get into trouble with geese? *(In the barn.)*

5. Why did Maggie come running out of the barn yelling? *(The goose was biting the seat of her pants.)*

6. What did Maggie's parents do at the end? *(They laughed* [1/2]; <u>Probe:</u> And then what did they do? *They helped her get away from the goose.* [full credit])

**# of seconds to read passage: _____**

**# of errors: _____**

**If the child makes more than 15 errors <u>OR</u>**
**if the child takes longer than 117 seconds to read this passage,**
**STOP. DO NOT administer any more passages.**

| Errors | |
|---|---|
| Accuracy | |
| Rate (8,820/# sec) | |
| Comprehension | |

# Oral Passage Reading Task

# Third Grade Examiner Copy, Form B

**THIRD GRADE**          **FORM B (168 words)**          **"Edward's Kitten"**

**Examiner's Introduction:** *This story is about a boy and his new pet.*

Edward's friend has a cat named Bell that liked to sit by a sunny window. Edward liked to pet Bell's smooth fur, and the cat seemed to enjoy being petted, sitting very still and purring softly.

One day, when Edward learned that Bell was going to have kittens, he begged his mom to let him have a cat. She said yes, and Edward was thrilled.

When the kittens were born, Edward chose an orange and white kitten from the litter. The kitten, which looked just like Bell, slept a lot, so Edward named her Sleepy. Sleepy had to stay with her mother for eight weeks, but at last she was old enough for Edward to take her home.

Edward put a towel by a sunny window in the kitchen, thinking that Sleepy would like to sit there. But Sleepy never seemed to sit still. She was too busy running, jumping, and playing – all day long. Sleepy was a delightful pet, but she was not like her mother, Bell.

---

**Questions**

1. Where did Edward meet the cat named Bell? *(At his friend's house.)*

2. What did Edward like about Bell? *(She sat still while he petted her fur.)*

3. Why was Edward glad to know that Bell was going to have kittens? *(He wanted one of the kittens.)*

4. What name did Edward give to his new kitten? *(Sleepy.)*

5. How long did Sleepy have to stay with his mother before Edward could take her home? *(Eight weeks.)*

6. How was Sleepy different from his mother, Bell? *(Sleepy never sat still.)*

**# of seconds to read passage: _____**

**# of errors: _____**

**If the child makes more than 16 errors OR**
**if the child takes longer than 134 seconds to read this passage,**
**STOP. DO NOT administer any more passages.**

| | |
|---|---|
| **Errors** | |
| **Accuracy** | |
| **Rate (10,080/# sec)** | |
| **Comprehension** | |

**Appendix H**

**Performance Criteria for Instructional Reading Level Classifications (Morris et al., 2018)**

| Passage level | Accuracy (%) | Minimum rate (wpm) | Comprehension (%) |
|---|---|---|---|
| Emergent | -- | -- | -- |
| Preprimer 2 | 90-97 | 30 | 90-100 |
| Primer | 90-97 | 40 | 90-100 |
| Late-first grade | 90-97 | 50 | 90-100 |
| Second grade | 93-97 | 60 | 90-100 |
| Third grade | 95-97 | 80 | 90-100 |

# Appendix I

## First, Second, and Third Grade Word Lists Used for Read the Words and Spelling Tasks

| First Grade | Second Grade | Third Grade |
|---|---|---|
| **Form A** | **Form A** | **Form A** |
| pet | chain | soap |
| wish | thick | knife |
| best | trade | scream |
| hide | dress | batter |
| trap | sleep | mind |
| rock | cloud | count |
| bump | storm | voice |
| drive | shopping | careful |
| plane | cool | stepping |
| chin | stuff | baseball |
| **Form B** | **Form B** | **Form B** |
| wet | train | real |
| dish | stick | knee |
| nest | chase | straw |
| side | grass | dollar |
| flat | clean | find |
| sock | shout | mouth |
| junk | short | noise |
| prize | dropping | useful |
| plate | pool | tripping |
| chip | spell | campfire |

**Vita**

Ashley Pennell grew up in Concord, North Carolina. She earned a Bachelor of Science in Elementary Education from Appalachian State University in Boone, North Carolina in 2012. In May of 2015 she was awarded a Master of Arts Degree in Reading Education also from Appalachian State University. She was accepted into the Doctoral Program in Educational Leadership at Appalachian State University in 2015 and earned her Ed.D. in May of 2021.

Ms. Pennell taught first and second grade in the North Carolina public school system for three years prior to entering the doctoral program as a full-time student. Since coming to Appalachian State University as a doctoral student in May of 2015, she has worked closely with Dr. Darrell Morris examining early reading assessments and learning clinical approaches to teaching reading. She has also worked with Dr. Devery Ward exploring how instructional approaches from the reading clinic are implemented in the classroom setting. Additionally, she has worked with Dr. David Koppenhaver and Dr. Connie Green on research related to children's literature. Ms. Pennell has been an instructor at Appalachian State University since spring of 2015, teaching ten different courses for the Reading Education and Special Education Department.

Ms. Pennell resides in Vilas, North Carolina with her husband, two children, and beloved dogs. She is currently continuing her teaching and research interests at Appalachian State University in Boone, North Carolina, where she is an Assistant Professor of Reading Education.