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Developmental Gradations of Kindergartners' Concept of Word in Text: An Examination of the Relationship between Fingerpoint Reading Skills and Other Early Literacy Measures

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by

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Abstract

This study examined the relationships between concept of word development and other early literacy measures (rhyme awareness, beginning sound awareness, alphabet knowledge, letter sound knowledge, spelling, and word recognition in isolation) using data from the PALS-K. Supporting previous research by using a much larger data set than had been used to date, Pearson Product-Moment correlations were used to describe the relationships between total concept of word scores and the literacy measures and multiple regression analysis were used to examine the ability of the literacy measures to predict total concept of word scores. Extending previous research, this study examined the developmental gradations in children's concept of word, a novel approach to examining concept of word data. Discriminant Analyses were used to build and test a model to identify the literacy measures from the PALS-K that best predict a child's level of concept of word development – developing, rudimentary, or firm.

Pearson Product-moment correlations indicated significant relationships between all variable on the PALS-K and total concept of word scores with word recognition in isolation scores and spelling scores demonstrating the largest correlations. Standard multiple regression indicated that the subtests on the PALS-K were able to significantly predict a large portion of the variance in total concept of word scores with word recognition in isolation scores and spelling scores contributing the most unique variance. Discriminant analyses indicated the measures were able to classify students' concept of word development into the categories of developing, rudimentary, and full/firm, with word recognition in isolation score and spelling scores being most associated with the functions generated. Implications for teaching and future research are also discussed.

Dedication

To my family, who believed in me.

Acknowledgements

First, I would like to thank my family, to whom this dissertation is dedicated. I would not be the person I am today if it were not for the influences of my mother and father who always encouraged and expected me to continue my education. My husband, David, is my source of motivation and my children, Delainey and Reyna, are my sources of inspiration. Without them, I could not have found the time, strength, or determination to complete this project. Thank you for the gifts of time, love, and encouragement. You are my life and I love you!

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Chapter 1

Introduction

Piaget was among the first researchers to present a developmental perspective on learning. His model of intellectual development, while criticized by some, has helped teachers understand more about how the thought processes of children develop and his notion of qualitative, stage-like changes that occur in cognitive development provide the foundations for other developmental theories. Piaget's method was to observe the errors in a child's perspective, hypothesize what these errors implied about a child's knowledge or view of the world, and then test the hypothesis with simple tasks. Thus, he was one of the first researchers to view errors as not simply right or wrong, but "as evidence of an incomplete perspective or state of knowledge" (Henderson, 1985, p. 39). These errors are considered by some (e.g., Bear, Invernizzi, Templeton & Johnston, 2012; Flanigan, 2007; Gentry, 1982; Goodman, 1976) to be windows into the mind that allow us to understand a child's level of development. Developmental research begins by observing children in their natural setting -- be that home, school, or play (Deese, 1992; Henderson, 1985). In addition, a developmental perspective doesn’t tell us how a child learns a particular skill or how to teach the child to do something but it may show us when and where we might begin instruction (Henderson, 1985).

Developmental learning theorists, such as Jeanne Chall, Linnea Ehri, and Edmund Henderson, used their knowledge and understanding of Piaget's unique methods of observation to create their own models of literacy development (which are described in more detail in chapter two). Within each of these models is a stage of early literacy development, often observed in Kindergarten and the early primary grades, where children are just beginning to make sense of our English orthography. Few would argue that learning to read in the primary grades is an important factor in succeeding in school. However, learning to read is a complex and often difficult process. According to Morris, Bloodgood, and Perney (2003a), "Many children struggle with learning to read in first grade and, once they fall behind, have difficulty catching up with their peers" (p. 93). Why do so many children struggle with learning to read? The answer may be found in the developmental phenomenon known as concept of word, the ability to match spoken words to print in a memorized text (Flanigan, 2007; Mesmer & Lake, 2010; Morris, 1981; Morris, 1983; Morris, 1993; Olliff, 1991).

Statement of the Problem

Concept of word development is an area that is under-researched (Flanigan, 2007; Mesmer & Lake, 2010; Morris, et al., 2003a). Why is concept of word research so absent in the literature? Mesmer & Lake (2010) suggest that there are two reasons for this. First, they hypothesize that the fields of emergent and early beginning literacy simply have not probed deeply enough into development in this area to understand concept of word as a valid phenomenon in need of study. Secondly, they propose that perhaps we, as highly literate adults, have difficulty perceiving this early literacy development in children. As Morris, Bloodgood, Lomax, & Perney (2003b) stated, "Until one actually sees a child struggling to finger-point read a simple text - struggling to match spoken words to printed words - it is very easy to take this developmental skill for granted " (p.322). Mesmer and Lake (2010) liken this lack of awareness of concept of word development to the lack of awareness about the importance of phonemic awareness development prior to the 1990s. It is now widely accepted that an awareness of sounds in speech, known as phonemic awareness, is a critical precursor to cracking our alphabetic code, but that was not the case prior to the 1990s. Perhaps researchers simply do not yet perceive the importance of concept of word development at this time.

Observations in most preschool, kindergarten, and primary grade classrooms would uncover many activities that develop a child's concept of word. The use of big books for sharing stories, teachers modeling print tracking, children memorizing rhymes and chants and then reading and rereading them for pleasure -- all of these are common activities and naturally help facilitate the development of a concept of word. However, a discussion with the teachers in these same classrooms about the phenomenon of concept of word would likely be brief. Most teachers include these activities in their instructional days because they are part of their basal reading series or district curriculums, but few teachers understand purpose behind these particular strategies (Flanigan, 2007). Concept of word experiences are typically enjoyed by most young children and they relish seeing themselves as "readers". Classrooms where these common activities occur could easily be transformed into classrooms where these activities are more purposeful and targeted, thus perhaps helping more children view themselves as successful readers. Success breeds motivation, and this type of instruction might be a way to foster successful attitudes toward reading, even if this type of reading is not considered "reading" in the conventional sense.

For teachers, having an understanding of the development of a concept of word can expand their understanding of their students' literacy development. Concept of word research seems to suggest that learning about our alphabetic system as well as attainment of a concept of word may be a necessary step before a child can move to more complex literacy tasks such as developing a sight word vocabulary and the ability to segment phonemes in speech and in writing (Flanigan, 2007; Morris, 1993; Morris, et al., 2003a). If this is the case, a teacher can assess the concept of word development in her students and determine the best use of instructional time in her classroom (Blackwell-Bullock, Invernizzi, Drake, & Howell, 2008-2009). Without the full development of a concept of word a child could have significant difficulties developing a core sight vocabulary and the ability to segment phonemes. Since instruction in phonemic awareness and sight word instruction are part of most kindergarten literacy curriculums, a teacher might maximize her instructional time by helping a child develop a concept of word concurrent with these skills.

Rationale and Purpose

Like so many other literacy concepts, more research is needed to fully understand the development of a concept of word in young children and the associations between this phenomenon and other early literacy skills. Previous studies focusing on the development of a child's concept of word have dealt with relatively small samples of children - from a low of 24 students in Mesmer & Lakes' 2010 study to a high of 109 students in Uhry's 1999 study. Replication studies utilizing larger sample sizes may provide additional insight into this developmental phenomenon. In most studies, concept of word was viewed in terms of a mastery criterion. A further, more informative view might include an analysis of student performance on these measures in relation to the stages of concept of word development (developing, rudimentary, and full/firm). For example, instead of simply viewing students as having mastered concept of word or not, we might attempt to view concept of word development on a continuum and see where and how those other literacy skills develop in tandem. This would be useful because it may show overlaps or trends in development that could help teachers make more targeted instructional decisions. It would be useful to researchers as well as we try to solve the "what came first the chicken or the egg" dilemma in terms of concept of word; in other words, what develops first, a child's concept of word or a specified literacy skill. A third area to consider is related to sight word development. Flanigan's (2010) study indicated that the majority of children in his study did not develop a core sight vocabulary without the mastery of a concept of word. However, there were a small number of children who developed that sight vocabulary without the development of a concept of word. Rote memorization is likely the key here, and that is an area where many parents feel empowered to help their children succeed.

The present study supports previous research in the study of concept of word by investigating its relationship with other developing literacy skills using a much larger data set than has been used to date. It also extends the research by examining the data by developmental gradations in the growth of children's concept of word instead of viewing concept of word development as mastered or not. Guiding this research are the following questions: What are the relationships between concept of word development and other early literacy skills? Can a child's level of concept of word development (developing, rudimentary, full/firm) be predicted by scores on six early literacy measures (rhyme awareness, beginning sound awareness, alphabet knowledge, letter sound knowledge, spelling, and total word recognition in isolation score)?

Chapter 2

Review of Relevant Literature

The purpose of this chapter is to review literature as it relates to the synchrony of literacy development and the development of a child's concept of word. First, Jeanne Chall's model of reading development and Linnea Ehri's and Edmund Henderson's models of orthographic development will be reviewed as they are the predominant models cited in the literature. An emphasis will be place on their stages related to emergent and early beginning reading where children develop a concept of word. Next, the literature related to the development of a child's concept of word will be reviewed and recent research studies will be discussed.

Reading Development

In 1967, Jeanne Chall published L*earning to Read: the Great Debate* - a classic and comprehensive review of issues in reading. Among the book's greatest contributions to modern instruction in reading was the importance of teaching phonics (Adams, 1990). According to Adams (1990), the compilation of her review of existing data suggested that systematic phonics instruction, in addition to reading connected and meaningful text, is a valuable component of a beginning reading program. Chall herself contributes her desire to create a model of reading development directly to her work in L*earning to Read: the Great Debate*. She believed that she could better understand some of the conflicting results from her analysis if she attempted to describe development in reading by grade and age (Chall, 1983). Below is a description of Chall's six stages of reading development.

Chall's earliest stage, stage zero, is a time, from birth to age six, of prereading experiences when children are developing critical foundations for later reading success. From birth, children are exposed to our language and alphabetic system and are accumulating knowledge about print, books, words, letters, and how to communicate. In this stage, children engage in pseudo-reading behaviors, such as retelling a favorite story from memory, with the aid of the pictures in the book. The "errors" that children make in their "reading" have little to do with the actual text on the page.

Stage one is a time, during first and second grades, when most six and seven year olds are learning to read and decode text. According to Chall, the most important task for children in stage 1 is "learning the arbitrary set of letters and associating these with the corresponding parts of spoken words" (p. 15-16). Children in this stage are discovering the alphabetic principle and learning that spoken words are made up of a finite number of sounds. Unlocking this code is difficult for most students, and according to Chall, reading at this stage has been described as "[a] guessing and memory game, grunting and groaning, mumbling and bumbling, and barking at print" (Chall, 1983, p. 16). In the early part of this stage, as children learn our alphabetic system and begin to read, they tend to focus primarily on the meaning of their reading in that they supply their own words when presented with unknown text. This could be viewed as a slight carryover from the previous stage, where children could "read" a favorite story from memory, except in this stage, the children begin to use some pictures and context to help as they do not yet necessarily focus on the graphic aspects of print. This is largely because children are learning that text has meaning, but have not yet learned how to extract that meaning from the actual text. As children progress through this stage, they begin to focus more on the graphic nature of print and use those cues, instead of relying solely on meaning, to read unknown words. Towards the end of the stage, these young readers begin to attend to the graphic nature of print as well as the syntactic and semantic features.

Chall refers to her second stage of reading development as a time, during second and third grades or for most seven and eight year olds, of confirmation, fluency, and ungluing from print. In this stage readers are consolidating what they have learned about print in stage one and begin to read and reread familiar texts to develop fluency. Learning in this stage is not directed at acquiring new knowledge; instead, cognitive energy is focused on confirming what they already know. This is also the stage when children begin to recognize high frequency words with accuracy and ease since they are no longer solely focused on decoding. They begin to make connections with text, relating what they read to their own experiences and lives. Stage two readers are building confidence in themselves as readers as they are drawn to texts with which they can experience success - those with familiar content, subjects, or structures, such as series books and fairytales. The more time stage two readers spend reading and consolidating their newfound reading skills, the greater their change of developing the fluency needed to be successful in the next stage.

Stage three is the time between fourth and ninth grades when most nine to 14 year olds start to read to learn. A long stage, Chall proposes thinking of stage three in two parts - stage 3a when one is introduced to subjects and general content knowledge about the world and 3b when one's reading begins to approximate that of an adult where popular magazines and popular adult fiction are easily accessible for the reader. No longer is the act of reading the arduous task it was in stage 1 and 2 when children were learning to read. Prior to this stage, children learned most new information by watching and listening to others and the world around them. Beginning in stage three, reading begins to assume a more dominant role in the way information is learned and by the end of the stage as much, if not more, information is learned through reading. Stage three is marked by a growing importance of word meaning and prior knowledge since not all materials are familiar to the reader and a major task in this stage is to learn facts and master big ideas.

Dealing with multiple viewpoints is the hallmark of Chall's fourth stage of reading development. This is a time when high school students, or children aged 14 to 18, are introduced to a variety of viewpoints on the same subject. Content is presented in greater depth and no longer are topics presented from a single point of view. Critical thinking skills are developed and refined during this stage as the reader must begin to interpret the information presented and begin to make meaning for herself.

Chall's final stage of reading development, during college and beyond, is a time of construction and reconstruction of knowledge. During this stage, adults begin to read as their task dictates, not simply read every word in a text from start to finish. Skimming and scanning are skills that are applied as the reader attempts to determine what is important and what is not important to their purpose for reading. In this stage, the reader becomes adept at making decisions about the content of quantity of material to be read as well as the speed at which she will read and the level of detail to which she will attend.

The above discussion of Chall's stages of reading helps to illustrate the developmental nature of literacy development in that literacy begins at birth and continues to develop throughout life. This introduction to the stages of reading development lays the foundation for the discussion of orthographic development that follows in the next section.

Orthographic Development

Orthography is defined as the writing system of a language - specifically the correct sequence of letters, characters, or symbols in a writing system (Bear, et al., 2012). According to many researchers (Bear, et. al., 2012; Ehri, 1993; Henderson, 1984; Henderson & Templeton, 1986; Invernizzi & Hayes, 2004) English orthography is comprised of three layers: alphabet, pattern, and meaning. The alphabet layer is the foundational layer. It is here where children begin to make the connections between letters and sounds and apply those connections in reading and writing. As children are learning to read and spell, they rely on their rudimentary knowledge of letters and sounds and apply them literally by using the names of the letters for their primary spelling strategy (e.g., spelling the word *wait* as *YAT*). This letter name strategy is quite efficient; however, it is problematic in that not all letter names contain the accurate letter sound that the child needs. The novice reader uses an articulatory strategy in these situations, selecting the letter name that most closely matches the point of articulation for the desired sound (e.g., spelling the word *wait* as *YAT* - the sound /w/ is most like the sound articulated when you say the letter name Y). The pattern layer expands upon the alphabet layer and begins to introduce common patters in spelling and reading, such as those that involve silent letters and groups of letters that combine to make a new sound. In the pattern layer, the children are no longer limited by a one letter to one sound strategy. They begin to understand that the one-letter-for-one-sound strategy is not always accurate, particularly in the case of long vowel sounds, and that an additional letter is often required to make that long vowel sound (e.g., in the word *boat* the *a* is silent, and the word boat follows a common long vowel spelling pattern *CVVC)* The third layer is the meaning layer. This layer combines all of the features of the alphabet and pattern layers, but adds a new dimension of meaning. In this layer, children develop an awareness that letter groups such as affixes, roots, and stems have specific meanings. In this layer, words are viewed not only by the sounds and patterns within, but also by their connections to other words. For example, take the word *sign*. Why is there a silent *g* in the word? The answer does not lie in the alphabet connection, if it did, we would articulate the sound */g/*. The answer does not lie in the pattern connection either as *gn* is not a common English pattern. The answer lies in the meaning connection; sign has a silent *g* to maintain its meaning connection with words such as *signal* and *signature*. The three layers of orthography build on one another and overlap one another as a child's awareness of the English writing system grows. In the sections below, two models of orthographic knowledge will be discussed in detail - those of Linnea Ehri and Edmund Henderson.

Phases of Development in Learning to Read and Spell Words

Early in her career, Ehri was frustrated by the prevailing views of word reading - the decoding view and the direct-visual-access view (Ehri, 1998). In her view, "Readers who applied decoding rules produced an unrecognized blend of sounds, not a specific familiar word. Readers who tried to remember associations between visual forms of words and their meanings lacked any system for forming the associations, so this placed too great a burden on memory" (Ehri, 1998, p. 102). Her solution was to propose a four-stage, integrated model of literacy acquisition that highlighted the importance of reading and spelling development, one in which "readers form connections between the spellings of individual words and their pronunciations" (Ehri, 1998, p. 102). Ehri's model, first presented in the mid 1980's as a model of spelling development, has been refined through the years based on Ehri's research, and was adjusted in 2000 to reflect more of an emphasis on reading development with spelling development as a contributing factor. Ehri's model, as described below, is based on the following: Ehri, 1989, 1992, 1998 & 2000.

Ehri's first stage was initially referred to as the precommunicative stage and eventually renamed the prealphabetic stage. In this stage, children's invented spellings bear no resemblance to conventional English spelling or to sounds in words. When attempting to represent a message, children may produce scribbles, letter-like marks on a page, or strings of random letters, numbers, shapes, or symbols. Children in this stage use visual features of words to remember them (e.g., the two round "eyes" in LOOK), and become adept at reading environmental print (e.g., the golden arches help a child read the restaurant name McDonald's). Very few words are known to a child in this stage, and these "children have difficulty remembering how to read most words because the connections formed in memory are unsystematic or arbitrary" (Ehri, 2000, p. 28).

The second stage, known at first as the semiphonetic stage and known now as the partial alphabetic stage, is a time when children begin to make letter-sound connections. Because their knowledge of the alphabet is incomplete, semiphonetic spellers use letter names and some sounds to make connections between salient sounds heard and letters seen in words (e.g., BR or BVR for *beaver*). In this stage, reading is difficult because the children are unable to decode unfamiliar words and they are left with inefficient strategies such as trying to remember the word or guessing at a word based on context clues.

Next is the full alphabetic stage, formerly the phonetic stage, and is marked by the child's ability to segment phonemes within words and their conventional letter-sound knowledge. These children begin to develop the ability to read new words by analogy to familiar words and are able to decode unfamiliar words because they have a solid understanding of our alphabetic system. In fact, they are so proficient at using what they know about our alphabetic code, they often "find" extra sounds when they are stretching out a word in an attempt to spell it (e.g., spelling BALAOSIS for *blouses)* (Ehri, 1986).

Ehri's final stage is the consolidated alphabetic stage, which was previously labeled the morphemic or transitional stage. In this stage, children are no longer dependent on a linear approach to decoding or representing sounds in words; instead, they begin to learn about "the structure of larger units consisting of letter sequences that recur across different words" (Ehri, 2000, p. 29). These structures include units such as affixes, letter doubling patterns, long vowel marking patterns, and syllables among others. Using chunks such as these make reading and writing unfamiliar multisyllabic words an easier task for these children.

Ehri has been a prolific publisher of her theory and work (more than 120 articles, chapters, and books since the early 1970's) and has made a "considerable personal contribution to this process [of phases of reading acquisition being accepted] both within the academic community and within the teaching community" (Beech, 2005, p. 56). Her model does much to help us understand how reading and spelling develop together; in fact, she conceptualizes learning to read and learning to spell as two sides of a coin because both processes develop together and are reciprocally related (Ehri, 2000). In the section below, another theory of orthographic development will be discussed - that of Edmund Henderson. Henderson's model is similar in many aspects to Ehri's - specifically in that they both posit that reading and spelling develop in tandem. One major difference is that memory plays a large role in Ehri's stance on reading and spelling development - that memory of written forms of specific words drives progress in reading and spelling. The underlying premise in her theory is "readers...build a lexicon of written words in memory. As they read the same words repeatedly, the spellings of the words become amalgamated or bonded to syntactic, semantic, and phonological identities already stored in memories" (Ehri, 1998, p. 99). However, memory is not always the most efficient means of learning as rote act of memorization does not allow the child's active participation in the process - a central theme in Henderson's model.

Stages of Literacy Development

In 1971, Charles Read published a seminal paper describing the development of preschool children's spelling proficiency. He was among the first researchers to notice that the errors young children make in spelling are remarkably consistent and predictable, and his work suggested that there was logic to the once perceived randomness of children’s spelling errors (Henderson, 1985). Read's paper provided one of the first insights regarding the developmental nature of spelling - that children's invented spelling representations gradually become more complex as their literacy knowledge grows. Edmund Henderson followed up on Charles Read's initial work and took the notion of spelling error analysis further, proposing a comprehensive model of literacy development using spelling as a window into development of a child's orthographic knowledge.

Henderson's model, developed after many years of observing and working with young children (e.g., Beers & Henderson, 1977; Henderson, 1974; Henderson, Estes, & Stonecash, 1972), proposed a series of developmental stages through which children progress and suggested a synchrony in literacy development -- the idea that development in one literacy area impacts development in others. Henderson's research spawned a continuing line of research into spelling and literacy development commonly referred to as the "Virginia studies" (e.g., Abouzeid, 1992, Bear & Templeton, 1998; Henderson, 1985; Henderson & Beers, 1980; Invernizzi, Abouzeid, & Gill, 1994; Templeton & Bear, 1992) and his students continue to research and refine his literacy model to this day.

Henderson's developmental model, also referred to as the Virginia model (Abbott, 2001), proposes five stages of development in English speaking homes - preliterate, letter name, within word pattern, syllable juncture, and derivational constancy. While these stage configurations remain largely unchanged, they have been refined over the last 30 years and some of the stages have been renamed to more accurately reflect the concept development within the stage (Bear, et al., 2012). For example, the preliterate stage, also known as the prephonemic stage for a short time, is now commonly known as the emergent stage to reflect the child's emerging literacy awareness and knowledge. What is now commonly referred to as the letter name stage was once subdivided into the semiphonemic/early letter name stage and letter name stage. The syllable juncture stage has been renamed the syllables and affixes stage to more accurately represent that the awareness in this stage is not simply about spelling patterns that occur at the juncture of two syllables, but more comprehensively about spelling patterns within a variety of syllable types and what happens when affixes are added to syllables and words. The derivational constancy stage is now known as derivational relations in an attempt to clarify that although many derivational concepts are constant, the concepts are more about the meaning relationships within and between words. The Virginia model, as described below, is compiled and synthesized from many sources including: Bear, et al., 2012; Bear & Templeton, 1998; Henderson, 1981, 1985; Henderson & Templeton, 1986; Templeton, 1991.

In the first stage, previously known as the preliterate or prephonemic stage, students are both emergent readers and writers. This period of development is typically defined as birth through about Kindergarten, but may continue past this point depending on the literacy experiences of the child. During the emergent stage, children are first learning about our spoken language and then about our written language. The emergent stage is a time of great learning and curiosity for children. Early in life, children are immersed in the language of the parents. Communication efforts are at first reflexive (e.g., crying when there is a need to be met) and become more intentional as the purposeful desire to communicate grows. These early efforts help the child understand that the purpose of speech is to communicate which in turn facilitates the later understanding that print serves the same purpose. Gentry (1982) noted that once a child begins to become aware of words as separate units, there is a halt in random inventions and children begin spelling by single letters. These emergent children seem to understand that a word is not comprised of random letters and marks, but that there is a definite purpose to the print on the page; in other words, the child seems to know what a word *is not* but cannot yet define exactly what a word *is* (Henderson, 1980). Late in this stage, understanding what a word is becomes the work of the emergent reader -- the task is to develop a concept of word.

In the second stage, students are beginning readers in the letter name stage of spelling development. With a strong foundation in oral language, a child in the beginning stage of reading explores the word of print. In the emergent stage, the child began to experiment with a voice to print match when reading memorized text. Once the child's skills progress in this concept of word task, and her skill level is considered rudimentary or firm/full, she moved into the beginning stage of reading. Early in this stage, memory and pattern still play a large role in early reading activities; however, the child also begins to recognize and read words by sight and out of context. Beginning readers are learning about our alphabetic system and trying to crack our alphabetic code. At first, reading is staccato and disfluent as the child is completely focused on each word on the page instead of the meaning of the passage as a whole. Smith (1973) attributes the tunnel vision of the beginning reader, stumbling along focusing on one word at a time, to a beginning reader's lack of word knowledge that leads to an overload of information. The same is true for spelling development - the child is focused on each word and letter separately. Writing and spelling are laborious tasks as the child attempts to break each word down into its component letters and sounds and then graphically represent those on paper. Letter name spellers primarily work in the alphabetic layer of English orthography as they learn the most common representations of consonant and short vowel sounds. As the child becomes more confident in her newly acquired skills her reading gradually becomes less labored and focused on individual sounds and letters, and she begins to read and decode unfamiliar words in chunks instead of one letter at a time. She begins to recognize that some simple, letter-name representations of words "don't look right" (Henderson, 1980). Her knowledge of sight words, or high frequency words recognized by sight, increases dramatically and her cognitive energy is freed so that she may begin to focus on meaning in her reading as she reads longer and longer text. The same is true in spelling - the child is freed from the need to have one letter represent one sound and begins to learn about groups of letters and how those letters may combine to produce new sounds - and this sets the stage for the transition to the next stage of development.

In the third stage, students are transitional readers in the within word pattern stage of spelling development. Transitional readers are no longer struggling with each letter and sound in each word. They have solidified their knowledge of letter-sound correspondences and begin to notice more complex patterns within words. Transitional readers begin to approach fluency in their reading as they now recognize many words by sight and have at their disposal several strategies for decoding unknown words. Appropriate reading materials become longer in length and most transitional readers begin to enjoy the world of series books - striving to read each installment in the favorite series. Not only are transitional readers learning about patterns within words that they are reading, they are learning to spell some common patterns as well. The within word pattern stage of spelling development is a time of complex development as children learn to represent long vowel patterns, ambiguous vowel patterns, and complex consonant clusters in single-syllable words. Unlike the letter name stage where there was often a letter to sound match, the within word pattern stage opens the door to the world of silent letters and groups of letters that combine to make new sounds. According to Henderson (1980), "This pattern concept that children must master...is a surprisingly demanding requirement. It is far more complex than the direct matching plan of the letter-name strategy" (p. 53).

In the fourth stage, students are intermediate readers in the syllables and affixes stage of spelling development. Intermediate readers are proficient readers; a child in this stage can read almost any material that is presented. The intermediate stage marks a shift from the previous stages in that these children are now expected to efficiently read and gain knowledge from that reading - in other words, the focus has shifted from "learning to read" to "reading to learn". Series books are still popular with intermediate readers, although the length, structure, and content of their chosen books are significantly different. Intermediate readers are also syllables and affixes spellers. The syllables and affixes stage is a more complex application of earlier stages as children learn how to apply learned spelling patterns in the new context of multisyllabic words. This stage is also a time when children start to make a meaning connection in their spelling and reading as they learn to accurately represent common prefixes and suffixes and learn about spelling patterns in a variety of syllable types including open, closed, accented, and unaccented.

In the fifth stage, students are advanced readers in the derivational relations stage of spelling development. This stage typically begins in junior high school and continues throughout adulthood. Henderson (1980) set the age for final mastery of this stage at 100 based on the conviction that "all of us may continue to learn more about the words we write as long as we live" (p. 40). He further asserted that children who achieve this level of development are presented with "a lifetime opportunity to learn their way more deeply into the vocabulary treasure house of English" (p. 71). The advance reading stage is a time of specialization where older children and adults begin to learn deeply about individual subjects - be those subjects of personal interest to learner or the content of required courses. During the derivational relations stage of spelling development, learners become familiar with meaning connections behind many "questionable" or misunderstood spellings in the English language. The exploration of word histories, or etymologies, furthers the learners' knowledge and vocabulary growth.

The above discussion helps to illustrate the current understandings of the developmental progression in the growth of a child's orthographic knowledge and reading ability. This next section will focus on the development of a child's concept of word. In relation to the theories discussed above, a child's concept of word typically develops in Chall's stage zero to early stage 1, Ehri's prealphabetic to early partial alphabetic stage, and Henderson's emergent to early beginning/letter name-alphabetic stage. In the next section, the literature related to the development of a child's concept of word will be reviewed.

Concept of Word

Upon entering school, children usually have a grasp of their oral language system. This oral language was not taught, but developed intrinsically and naturally out of a need to communicate with others. In contrast, learning to read is not a natural process, like oral language development, as it does not require interaction with another person; instead, it is an artificial process between a reader and a text. Phonological awareness, the ability to attend to and manipulate sounds orally in spoken language, is an important aspect of early literacy instruction. Many researchers posit that there is a relationship between phonological awareness and early reading ability; however, the exact nature of this interaction is not fully understood (Adams, 1994; Blachman, 2000; Flanigan, 2007; National Reading Panel [NRP], 2000; Snow, Burns, & Griffin, 1998; Stahl & Murray, 1994; Wagner, Torgeson, & Rashotte, 1994; Wagner, Torgeson, Rashotte, Hecht, Barker, Burgess, et al., 1997). According to Olliff (1991), "…beginning readers approach the task of learning to read in a state of cognitive confusion. They cannot accurately describe what readers do and appear unaware of the correspondence between print and speech" (p. 250). It is this confusion that can lead to difficulty in learning to read. This is especially true for children who have not been read to (Adams, 1994). Teachers help children learn what readers do; and in particular, teachers of young children help beginning readers develop an awareness about written language and realize that their spoken words can be represented in print – a critical concept in early literacy (Justice & Ezell, 2001; Roberts, 1992). This awareness of the match between spoken and written words, often referred to as *fingerpoint reading*, is known as a concept of word in text (Flanigan, 2007; Mesmer & Lake, 2010; Morris, 1993; Morris, et al., 2003a, 2003b; Uhry 1999, 2002).

How do children develop this concept of word in text? It appears that a child must develop a cognitive toolkit of early literacy skills that includes some phonological and alphabet awareness (Templeton & Thomas, 1984; Zutell, 1979). According to Ehri and Sweet (1991), a strong foundation of phoneme segmentation skills, knowledge of the letter names, and the ability to recognize a few pre-primer words facilitate the development of a child’s concept of word. More recently, Morris, et al. (2003a) proposed a developmental sequence of early reading acquisition based on information gathered during their longitudinal study of 102 children, beginning in kindergarten and ending in first grade. They found that, in kindergarten, students first develop alphabet knowledge, and that knowledge is followed by beginning consonant awareness in words, concept of word in text, spelling with beginning and ending consonants, and finally the ability to segment phonemes. This development in kindergarten is followed by the ability to recognize words and read words in context - usually in first grade. Other researchers have considered additional tasks in early reading acquisition, but the consensus seems to be that some type of print related knowledge is necessary before a child can develop a concept of word (Ehri & Sweet, 1991; Flanigan, 2007; Gately, 2004; Morris, 1981, 1992, 1993; Morris, et al., 2003a, 2003b). In fact, it appears that alphabet knowledge tends to be related to all aspects of print-related knowledge, including the development of a concept of word (Morris, et al., 2003a). Why is this alphabet knowledge significant? Since a concept of word is the understanding that spoken words can be written down and represented in print, the knowledge of the letters and sounds of the alphabet can help the child anchor the words on the page, and the initial letters in words can become a point of reference for the child.

Edmund Henderson (1980) was the first to refer to a child's development of concept of word as a watershed event in the process of learning to read. Henderson (1980) went on to say that he believed the difficulties that emerging readers experience is related to the development of concept of word. "It is not that prereaders cannot discriminate phonemes or learn so called letter sounds; in fact, they must in order to speak. It is simply that, lacking a stable concept of word as a bound figure with a beginning and an end, they cannot know where to focus their attention" (p. 10). Morris (1981) suggested that a stable concept of word is necessary for a child to develop a sight word vocabulary and attend to the letter and sounds within individual words. Marie Clay

(1991) discussed the concept of word in what she called reading the spaces. The child's first attempts to read a memorized text, according to Clay (1991), mimic the fluency of her oral speech. Children without a concept of word in text recite the text and their pointing behavior is in the form of a quick left to right sweep, without making accurate voice to print matches. This fluent sweep is slowly broken down until it corresponds to word-by-word reading, matching the voice to print. It is at this point that the child has developed a concept of word. "At that point, the child over-emphasizes the breaks between words and points with his finger. *He has taken a major step towards integration of these early learnings when his reading slows down and even becomes staccato"* (Clay, 1991, pp. 164-165). Achieving a concept of word is an important developmental step for children. It signifies that they have become consciously aware that the words they speak can be represented in print. This realization is a necessary step in learning how to read (Clay, 1991).

To develop a concept of word, the child requires many opportunities to interact with text and print. As children interact with text and learn more about their written language structure, their concept of word can be considered in the following ways: those children who are *developing* a concept of word, those who have a *rudimentary* concept of word, and those who have a *full* or *firm* concept of word (Blackwell-Bullock, et al., 2008-2009; Mesmer & Lake, 2010; Morris, 1983). Early in literacy development, a child is simply developing her awareness of words in print. When asked to track text, she may demonstrate her lack of familiarity with print concepts and directionality by pointing to the pictures or other places on the page as she recites the text and is not able to identify individual words in context or isolation (Morris, 1992). A child who is in the developing stage might also show directionality and read with a sweeping gesture or point to the text based on the rhythm, beat, or stress of the poem he is reciting (Bear, et al., 2012). As the child begins to develop more mature literacy behaviors, his grasp of the concept of word in text is rudimentary (Morris, 1993). This simply means that he can track some text accurately, but makes mistakes. A child with a rudimentary concept of word can point to most single syllable words accurately, but experiences difficulty with multi-syllabic words. At first, the child will point to a separate word for each syllable uttered and will "run out" of words on the page. The child realizes that he made an error in tracking, and may be able to self-correct (Blackwell-Bullock, et al., 2008-2009). This same child may be able to identify some words in the context of the text being read from memory, but is unlikely to recognize the same words in isolation (Blackwell-Bullock, et al., 2008-2009). In contrast, a child with a full concept of word can easily self-correct errors and accurately point to the text as he recites the memorized words. He can also immediately identify words within the memorized text and recognize those same words in isolation (Blackwell-Bullock, et al., 2008-2009, Morris 1992). A child with a full concept of word can accurately distinguish between the words and white spaces on the page and use her knowledge of letters and sounds to help keep her place in the text and locate words when asked.

A concept of word is not a skill that can be "taught" to a child. Rather, it is an awareness that develops over time as the child begins to crack the code of our alphabetic system. As Morris (1983) implies and Henderson (1985) states, "Ways must be found to help these children follow text attentively until the 'speaking' and the spaces are aligned.

There is, of course, no way to ‘tell’ children this concept. It can be realized only from concrete experience with written text" (p. 43).

Concept of Word in Text Research

In the paragraphs below, specific research on the development of children's concept of word will be discussed. Following this, the four most recent studies that focus on concept of word development will be summarized, critiqued, and analyzed for potential gaps and possible future research.

Uhry, 1999

In 1999, Joanna Uhry conducted a large correlational study to examine the relationship between fingerpoint reading and other early literacy skills. Uhry’s first goal was to determine if letter identification and phoneme segmentation would be correlated with fingerpoint reading (also known as concept of word), and if invented spelling would account for unique variance beyond those measures. Her second goal was to examine Morris’s (1993) model of initial phoneme spelling as a precursor to fingerpoint reading and Ehri’s (1992) model that phonemes in several positions contribute to fingerpoint reading in her study to see how phoneme representation in invented spellings might contribute to fingerpoint reading. A third goal of her study was to examine student’s self-reported strategy use during fingerpoint reading to see how students perceived their reading.

In this 1999 study by Uhry there were 109 kindergarteners from five English-speaking classrooms in an urban school. Slightly more than half of the participants were Caucasian (n = 64) and the remainder were African American (n = 19), Asian (n = 14), and Latino (n = 12). Roughly one quarter of the students were eligible for free or reduced lunch, and the sample was almost evenly split between genders. Midway through the kindergarten year, each teacher was given the big book and several little book copies of *Oh No!* by Scharlaine Carins (1995). The text uses rhyme and repetition to describe a series of messy accidents, the title words appear in red at the end of every 4-line verse, and the book had large illustrations to help in the fingerpoint reading task. Teachers read the book aloud several times a day for four days and students could choose to reread little book copies during independent reading time.

The researcher conducted assessments from late January through early March and spent approximately 20-25 minutes assessing each child. Each class involved for approximately two weeks – one week for learning and working with the book and one week for testing. Each assessment session began with review of book to control for length of time between most recent reading of the text and the administration of the assessments. Assessments used in this study included the Peabody Picture Vocabulary Test to assess oral vocabulary, the Letter Identification subtest from the Woodcock Reading Mastery Test to assess alphabet knowledge, the Test of Auditory Awareness Skills (TAAS) and a researcher developed phoneme segmentation task to assess phonological awareness, a researcher developed test of invented spelling using the words from the book, an assessment of fingerpoint reading using the actual text in the book and a text only copy, and three tasks for word identification – the Word Identification subtest from the Woodcock Reading Mastery Test, a word finding assessment in the text only copy of the finger point reading passage, and self-reported strategy use for word finding in the text copy of the fingerpoint reading passage.

Hierarchical multiple regression analysis was used to examine the data in relation to the goals of the study. Data analysis indicated that invented spelling contributed an additional 14% of unique variance in fingerpoint reading scores beyond the unique contributions of letter identification, accounting for 24% of the variance in fingerpoint reading scores, and TAAS scores contributing and additional 5% of the variance, thus confirming the author's first hypothesis. Further analysis indicated that phoneme representation in invented spellings in the initial position accounted for 31% of the variance in fingerpoint reading scores and phoneme representations in the final position accounted for an additional unique 13% of variance. The author repeated this analysis and replaced the scores for final phoneme representations with phoneme representations in the medial position and found that medial phoneme representations accounted for an additional 8% of unique variance in fingerpoint reading beyond the contribution of phoneme representations in the initial position. In other words, the analysis showed that phonemes in both the medial and final positions accounted for unique variance in fingerpoint reading scores beyond the contribution of phoneme representations in the initial position. The author's final goal in this study was to examine children's self-reported strategy use in fingerpoint reading to see if children at varying levels of competency with fingerpoint reading reported using different strategies. After categorizing the children as Non-Readers, those who read two or fewer words on the word find task, or Beginning Readers, those who read three or more words, the researcher examined each group's strategy use. There were no significant differences between the groups in terms of self-reported strategy use except in two instances. Non-readers used a page position strategy, such as, "It's on this page" or "I knew it was on this line," significantly more frequently than beginning readers. In contrast, beginning readers reported using a phoneme segmenting strategy, such as using initial sound /s/ in the word "spot" as the child searched for the word on the page, or a sight word strategy, such as, "I knew the word," significantly more frequently than non-readers.

In this study, Uhry expanded upon previous research related to fingerpoint reading. While her findings seemed to support Ehri's model and contradict Morris's model, the author indicated that the age and skill level of the participants could have contributed to the discrepancy. The children in Morris's study were younger that the children in Uhry's study and most of the children in Morris's study were non-readers whereas most of the children in this study were beginning to read. From a research perspective, Uhry was most interested in the relationship between fingerpoint reading and invented spellings. In her analysis, she examined each child's invented spellings of the words from the book that was being read and assigned points based on correct representations of phonemes in the initial, medial, and final positions. The author assumed that correct representations in spelling these words was sufficient to determine if the children used their knowledge of phonemes in these positions to aid in the fingerpoint reading task. Because spelling development lags behind reading development this may not be an accurate assumption (Bear, et al., 2012). It is possible that children may recognize and use phonemes in the final (or medial) position in words to locate them within the text, but may not yet be representing them in their writing. Another potential limitation with the invented spelling data lies in the words chosen for the task - NO, MY, FACE, DIRT, BED, CHIN, SPOT, and DRESS. The author purposely chose the words from the text hypothesizing that the ability to represent the phonemes in the actual words being read would be directly related to the child's ability to fingerpoint read the text. This choice may have inadvertently affected the data in a negative way. Most kindergarten students are in the late part of the emergent or early part of the letter name stage of spelling development (Bear, et al., 2012). As such, most kindergarteners are solidifying their knowledge of letter names and sounds and are learning to represent short vowel sounds in their writing. A few of the words chosen did not represent conventional phoneme-grapheme correspondences that are at the developmental level of most kindergartners. For example, the word MY is not a regular graphic representation of the long I sound, so would not be useful to a kindergartner in the way that the author hoped – as a way to locate letters on the page using their sounds. The word DRESS is another example of a problematic word. The affricate DR is articulated as /jr/ and once again does not provide the grapheme-phoneme match the author was describing. Using a more widely accepted spelling inventory to assess the child's invented spelling knowledge might have provided the author with data that more closely paralleled the children's skill level and could have produced different results in her analyses. The author also made some assumptions based on the students' self-reported strategy use for word finding. As emergent readers are very new to the act of reading in general, it is possible that they utilize strategies that they are not even aware that they are using, such as the initial sound in a word.

Uhry compared her results with Ehri's (1992) models of phonetic cue reading and Morris's (1993) model proposes a sequence in which early literacy development proceeds from beginning consonant awareness to concept of word development to full phoneme segmentation ability to word recognition ability (BC → CW → PS → WR). Findings were consistent with Ehri’s (1992) model of phonetic cue reading, which suggests that ability to represent phonemes in several positions contributes to fingerpoint reading, and seemed to be at odds with Morris’s (1993) model which suggested that only initial phoneme representation is necessary for accurate fingerpoint reading. This perceived mismatch between Uhry's findings and Morris's model may actually be a misunderstanding on Uhry's part. Morris did not suggest that ONLY initial phoneme representation was necessary for accurate fingerpoint reading; instead, Morris stated that, for the inexperienced reader, the initial letter or sound in a word is the most salient or prominent representation. Developmental spelling research has consistently shown that children are able to represent the initial sound in a word before they are able to represent phonemes in other positions (Beers & Henderson, 1977; Morris, 1993; Read, 1971) and other research has shown that children consistently find it easier to work with the initial sounds in words than with sounds in other positions (Lewkowicz, 1980). Morris simply posited that children whose concept of word is tenuous use this early phoneme segmentation skill to aid in dividing the letters on the page into word units. Using the beginning sound or letter in a word helps children to anchor the text on the page which supports children's' rudimentary, or incomplete, concept of word in text. As children practice this emerging skill of matching spoken words with printed words, they move from relying solely on the initial letter or sound in a word to using phonemes in the final and medial positions to aid in the task.

Another consideration is that although Uhry stated that she was examining Morris's model of initial phoneme spelling as a precursor to fingerpoint reading, she was actually testing her data for relationships between variables instead of testing for sequential development. Her use of hierarchical multiple regression further underscores this analysis in that her main goal was to determine if other-than-initial-position phonemes contributed unique variance in fingerpoint reading scores beyond that of initial phonemes. Her results indicated that this was the case, thus the basis for her argument that her findings were at odds with Morris's model. Morris' developmental hypothesis was simply that children have an awareness of beginning letters or sounds before they have a fully developed concept of word. He fully believed that as children's' literacy development progresses, they use additional visual cues (e.g., phonemes in the final and medial positions) when attempting to match spoken words to printed text, thus stabilizing their concept of word.

Uhry, 2002

In 2002, Joanna Uhry further explored the relationships between fingerpoint reading and other early literacy skills. The goals of this study were to build on and expand previous models of the development of fingerpoint reading skills (Ehri & Sweet, 1991; Morris, 1993; Uhry, 1999). In these previous studies, phonemic awareness and invented spelling skills were associated with fingerpoint reading; the present study proposed that one-to-one correspondence and automaticity in letter naming were also associated with fingerpoint reading skills.

At the end of their kindergarten year, 89 children from five kindergarten classrooms in an urban school participated in this study. The ethnic backgrounds of participants were White

(68%), Latino/a (14%), African America (12%), and Asian (6%) and 22% of the children received free or reduced lunch. Instruction across the classrooms was fairly uniform and followed a balanced approach to literacy instruction. Prior to data collection, in late April and May, the teachers introduced the children to the big book *Oh No!* (Cairns, 1995) to the children by reading the book once or twice each day over a four-day period.

Testing occurred after the teachers had spent at least 4 days sharing the book with their students. Data was collected by the researcher and graduate students, and each testing session began with a shared reading of *Oh No!* to control for the time elapsed between the data collection and the most recent exposure to the text in the classroom. Assessments used included the Peabody Picture vocabulary Test (PPVT-R) to assess general linguistic ability and rule out language skill development as a possible additional variable in the tasks, the Word Identification test (WID) from the Woodcock Reading Mastery Tests (WMRT) to assess word-level reading, and an assessment of fingerpoint reading ability using the first two 4-line verses from the big book presented as the big book pages and as a text only copy. Additionally, a researcher developed test of invented spelling using eight words from the big book was used as was a researcher developed assessment of one-to-one correspondence, called tagging, where the child was asked to count dots arranged on two pieces of cardboard tag counting (TAG). The remaining assessments included the Letter Identification test (LID) from the WRMT to measure letter naming ability, a test of full phoneme segmentation, a measure of onset segmentation, an alphabet recitation measure (Rote Alph), a number sequencing task, and four measures of Rapid Automatized Naming (RAN).

Data from this study were analyzed using correlation tables and hierarchical regressions. The first set of analyses were conducted in a successful attempt to replicate the findings from her previous study (Uhry, 1999) indicating that spelling made a unique contribution to fingerpoint reading beyond that of letter knowledge and phoneme segmentation. A hierarchical regression indicated that invented spelling contributed an additional 11% of variance in fingerpoint reading beyond that of receptive vocabulary, letter naming accuracy, full phoneme segmentation, and onset phoneme segmentation. In this study, the author proposed that one-to-one correspondence and automaticity in letter naming were also associated with fingerpoint reading skills. The measure of one-to-one correspondence, tagging, was found to be significantly correlated with fingerpoint reading ($r = .44$). Analysis also showed that tagging contributed an additional 4% of significant variance in fingerpoint reading scores beyond that of receptive vocabulary, invented spelling, and letter naming accuracy. On the measures of Rapid Automatized Naming (RAN), analysis indicated that each RAN subtest made a unique significant contribution to fingerpoint reading scores with the letter naming subtest contributing an additional 11% of variance beyond the other three; together, the four measures of RAN accounted for 37% of the variance in fingerpoint reading scores. The author took this analysis one step further to determine if the letter naming subtest of RAN, a test of letter naming speed, would make a contribution to the variance in fingerpoint reading scores beyond the contribution of letter naming accuracy (LID) scores. As hypothesized, the letter naming RAN scores accounted for an additional 15% of significant, unique variance in fingerpoint reading scores beyond the 31% variance attributed by LID scores.

Flanigan, 2007

In 2007, Flanigan published a study aimed at evaluating Morris's (1993) model of early reading development. Morris's model proposed four stages in which the growth of word knowledge becomes more complex and moves from an awareness of beginning consonant knowledge, to the development of a concept of word in text, into phoneme segmentation ability, and finally conventional word recognition skills. Flanigan's primary goals were to replicate Morris's study and test the validity of Morris's model.

The participants in this study included 56 kindergarteners, 26 girls and 30 boys, from two elementary schools. The ethnic makeup of the participants reflected the ethnic makeup of the schools (69% white, 11% African American, 3% Asian/Pacific Islander, 3% Hispanic, 14% multiracial) and most were from middle and upper middle class homes (11% eligible for free or reduced lunch). To promote homogeneity in the group and improve internal reliability, this study only included participants that did not qualify for or receive special education services and those whose primary language was English.

Data collection occurred at the end of the Kindergarten year, during the first two weeks of May. Each child was individually assessed during two 20-minute sessions by either one of the kindergarten teachers or by the researcher. The assessments used in this study came from the PALS-K, Phonological Awareness Literacy Screening-Kindergarten (Invernizzi, Meier, Swank, & Juel, 2003) and include beginning consonant awareness, concept of word in text, spelling, and word recognition. The phoneme segmentation task used was the same task used in Morris's 1993 study.

In order to answer the author's first three research questions related to replicating and testing the validity of Morris's model, each measure was assigned a mastery criterion so that a cross-tabs evaluation could be conducted. Flanigan's first research question was aimed at determining if beginning consonant awareness was a necessary but not sufficient condition for master of a concept of word in text. In this instance, cross-tabs results supported Morris's theory as no student in the study achieved the mastery criterion for concept of word in text without meeting the mastery criterion for beginning consonant awareness. The author also completed a chi-square test with data from these two variables and the results showed a significant association between beginning consonant awareness and concept of word in text ($p = .011$). The second research question hoped to determine if a child's mastery of a concept of word in text was a necessary but not sufficient condition for mastery of full phoneme segmentation ability on an oral phoneme segmentation task and an invented spelling task. Cross tabulation results supported this portion of Morris's model as no student had attainted mastery of full phoneme segmentation on either task without having full mastery of a concept of word in text. The chi-square association between a concept of word in text and oral phoneme segmentation ability was significant ($p < .001$) as was the association between concept of word in text and invented spelling ability ($p = .001$). A third question was designed to determine if a child's mastery of full oral phoneme segmentation ability was a necessary but not sufficient condition for mastery of word recognition. In this instance, Morris's model accounted for 89.2% of the students achieving the mastery criterion for full phoneme segmentation and the mastery criterion for word recognition; six students did not fit the proposed pattern in that they had a core sight vocabulary without meeting the mastery criterion for oral phoneme segmentation. Chi-square results showed that there was a significant relationship ($p < .01$) between phoneme segmentation ability and word recognition ability. A fourth research question was included to test the overall validity of Morris's model using a Guttman scale analysis. Flanigan hoped to determine the extent to which Morris's model accurately depicted a sequence of development from beginning consonant awareness, to concept of word in text, to full phoneme segmentation ability or spelling ability, to word recognition. The majority of students (approximately 90%) fit one of the hypothesized patterns, thus strongly supporting Morris's (1993) proposed developmental sequence. A coefficient of reproducibility, a common statistical test used to determine the significance of Guttman scaling results, was calculated and showed a significant result of .95 which strongly supported the proposed developmental sequence.

This study provided support for Morris's developmental model of early reading acquisition and might perhaps serve as a guide for teachers of emergent and early beginning readers. Morris's model suggests a developmentally targeted instructional sequence that can be used by teachers to balance instruction in early literacy skills such as phonemic awareness, spelling, word recognition, and contextual reading. In his results, Flanigan noted that approximately 90% of the participants fit Morris's proposed developmental pattern whether the oral phoneme segmentation task's mastery criterion was used or the invented spelling mastery criterion were used. The study's hypothesized relationship between spelling ability and full oral phoneme segmentation ability was supported ($r = .713$, $p = .01$). This indicated that invented spelling was a reliable measure of phoneme segmentation ability, which makes sense considering the nature of spelling development and the need to break down a word into its constituent phonemes in order to represent them in written form. In fact, invented spelling could be argued to be a more complex or sensitive measure of phoneme segmentation ability because of the addition of the written element. Thus, as a teacher is choosing assessments to help inform her instruction, a measure of invented spelling to assess phoneme segmentation ability could be a valid instructional choice. In addition, an invented spelling task can be administered to a group of students simultaneously, and thus save instructional time, whereas an oral segmentation task must be administered in a one-on-one situation. Along these same lines, the results of this study showed that children were not able to consistently segment or represent in writing all of the phonemes in single-syllable, short vowel words unless they had achieved the mastery criterion for a concept of word in text. A third interesting finding from this study was related to the development of a sight word vocabulary. The results of Flanigan's third research question showed that only 89% of the students mastered full phoneme segmentation ability before mastering a sight vocabulary. This discrepancy could be explained in a number of ways. As the author stated, it is possible that phoneme segmentation and word reading ability develop concurrently. It is also possible that there might be an instructional influence overriding the developmental influence. Most districts and schools require that kindergartners learn a specified number of sight words in order to meet curricular expectations. As a result, these children are often presented with a list of words to be memorized; an act that requires a great deal of practice and thus varying levels of achievement. This act of rote memorization could explain why some children were classified as having a core sight vocabulary without having the proposed prior skill of full phoneme segmentation. Flanigan decided to look at the acquisition of a core sight vocabulary in a new way in light of the results of his third research question. Since not all students fit the proposed model in terms of developing full phoneme awareness before developing a sight word vocabulary, he wondered if the acquisition of a concept of word in text, the step before full phoneme segmentation, was a necessary but not sufficient condition for the development of an initial sight vocabulary. The chi-square analysis showed a significant association between concept of word mastery and word recognition mastery ($p < .001$), and interestingly, no student had a core sight vocabulary without the mastery of a concept of word in text. Therefore, it appears that classroom attention focused on fostering the development of a concept of word in text could help facilitate the acquisition of a sight word vocabulary.

Mesmer & Lake, 2010

In 2010, Heidi Anne E. Mesmer and Karen Lake published a study related to concept of word in which they attempted to examine the role of syllable awareness in fingerpoint reading. Their primary purposes were to determine if syllable awareness would contribute unique variance to fingerpointing reading scores beyond that of letter naming and beginning consonant awareness and to determine if instruction in syllable awareness would influence fingerpoint reading of multisyllabic words in a concept of word task.

Participants in this study included 24 children, including equal numbers of males and females, from three preschool programs in the Midwest: a private child care facility, one associated with a private Christian school, and a lab school at the local university. The average age of participants was 52.33 months (*SD* = 12.39), and participants were screened to ensure that they did not already exhibit mastery of fingerpoint reading, were not able to read three or more target words on the screening measures, and that they were able to appropriately attend to instruction and/or cooperate with the researchers. The researchers pretested all participants and used the data to match participants for random assignment in the treatment or control groups. The intervention phase of the study lasted for four weeks with each group participating in four 20-minute sessions per week. Book reading procedures for each group were identical with the exception of the 2-3 minute syllable instruction included in the treatment group procedures. Each group participated in shared book reading of two books per week for a total of 16 books during the intervention. The control group read books created from common nursery rhymes; the treatment group read books created around common concepts such as birthday parties, eating dinner, etc. All books were created by the researchers and presented in a similar visual format; the treatment groups books consisted of syllable-controlled text so that the researchers could introduce the students to multisyllabic words in a systematic and controlled way and the control group books contained multisyllabic words as they were originally included in the selected nursery rhymes. There were differences in the numbers of multisyllabic words in the books used with each group. The treatment group books contained an average of 5.5 multisyllabic words (*SD* = 3.2) and the control group books contained an average of 8.87 (*SD* = 1.97). Books across both groups, however, were controlled for overall number of words (t (14) = 1.42, p > .18) so that no group received more print exposure than another; the average number of words in the treatment texts was 37 words (*SD* = 7.11) and control texts was 32 words (*SD* = 5.9). Measures used in this study included a fingerpoint reading task and a letter naming task created by the researchers as well as the initial Sound Fluency subtest of DIBELS (Dynamic Indictors for Basic Early Literacy Skills; Good & Kaminski, 2002) and the Syllable Blending, Syllable Segmentation, and Syllable Deletion subtests of the Phonological Awareness Test (Robertson & Salter, 1997).

The authors' first goal was to determine the impact of syllable-controlled text on students' fingerpoint reading scores. Results indicated that the post-test fingerpoint reading scores were not significantly different between the groups indicating that the use of syllable-controlled text did not influence fingerpoint reading scores. However, both groups exhibited a significant increase in fingerpoint reading scores (F (2, 21) = 20.58, p <.001, η^2= .53) from pre- to post-test indicating that practice in fingerpoint reading tasks had more of an effect on scores than the type of text used. Post-test scores did not differ from follow-up scores collected one month later (F (2, 21) = .14, p = .86) suggesting that the increase fingerpointing skills were maintained over time. The syllable awareness scores also appeared different from pre- to post-test so the researchers analyzed those scores and found a significant increase for all participants (F (1, 24) = 26.99, p < .001) but no difference between the groups indicating that the intervention influenced syllable awareness as well as fingerpointing. Next, the authors wanted to assess the role of letter naming, beginning consonant knowledge, and syllable awareness on fingerpoint reading. The authors hypothesized that syllable awareness would contribute unique variance beyond that of letter naming and beginning consonant knowledge. Hierarchical regression analysis indicated that the aforementioned skills accounted for 65% of the variance in fingerpoint reading scores (F (4, 23) = 83.28, p < .001) and that syllable awareness predicted an additional 20% of unique variance beyond letter naming and beginning consonant awareness. A second analysis was conducted on the scores of fingerpoint reading multisyllabic words and the model accounted for 56% of the variance with only syllable awareness as a significant predictor (F (4,23) = 5.94, p = .003). The authors wished to understand this result more clearly, so they ran a third analysis entering the three subtests of syllable awareness separately and found that only syllable segmentation was a significant predictor of fingerpoint reading of multisyllabic words (F (4,23) = 83.28, p <.001). The authors conducted some further analyses to replicate the results of Morris (1993) and Flanigan (2007), specifically that beginning consonant knowledge was necessary for mastery of concept of word. Using a mastery criterion on 70% on the fingerpoint reading scores, the authors found no differences between groups on beginning consonant awareness, letter naming, or syllable awareness, thus not replicating Morris's results. When they used a more stringent 90% mastery criterion, they found that their results replicated Flanigan's finding that participants who showed mastery in concept of word also showed mastery at letter naming but did not replicate his finding regarding beginning consonant awareness.

One limitation to this study is the small sample size (*n* = 24). Another limitation in terms of data comparison is the age of students in this study. The other studies discussed above were conducted with Kindergarteners at the end of the year, so the age difference between the preschool participants in this study and the children in Uhry's (1999) and Flanigan's (2007) studies is quite large, so results are not directly comparable. An additional consideration with these results is that within the design of this study, Mesmer and Lake (2010) made the assumption that a concept of word can be taught to students, as indicated by their creation of syllable controlled text and the intervention context. Most other studies (Flanigan, 2007; Uhry, 1999, 2002; Morris, et al., 2003a; Morris, et al., 2003b) regarding concept of word have viewed this skill as more of a developmental phenomenon that grows and changes over time as children's literacy skills grow. Altering the view of this concept and changing it into a skill of instruction (e.g. the author's attempted to provide scaffolded introduction in and practice with fingerpoint reading multi-syllabic words), could be one reason why the authors did not achieve their desired goal of improving fingerpoint reading skills by using a systematic and controlled introduction of multisyllabic words in text. In addition, the results showed that all groups made improvement after the intervention indicating that rather than being taught about concept of word, students simply benefitted from multiple opportunities to practice oral reading and tracking in connected text.

An interesting finding in this study is that the authors were able to replicate the relationship between letter knowledge and concept of word development, but were not able to replicate Morris's (1993) or Flanigan's (2007) findings that a relationship exists between beginning consonant knowledge and concept of word development. The authors offered three explanations for this. First, they suggest that there may be a measurement issue - that letter naming and beginning consonant measures may overlap in the skills they are tapping, that letter knowledge may be acquired earlier than beginning consonant awareness, and third, that even with some letter and sound knowledge, their participants may not have realized the letter/sound relationships. All three of these explanations have merit. However, another possibility might be one of instrumentation. The authors used the Initial Sound fluency subtest of the DIBELS assessment. In this assessment, the child is shown four pictures, the examiner names the pictures for the child, and then the participant is asked to identify the picture that begins with the sound the examiner produces orally. For example, the examiner might show pictures of a road, ball, fish, and hat. The examiner names the pictures as such and asks the child to identify the picture that begins with the /b/ sound. This subtest was designed and normed for kindergarteners as a test of initial sound fluency, the speed and accuracy with which students could identify the targeted picture, and the score is reported in terms of number of pictures accurately identified in 60 seconds. The authors of this study did not use the subtest in this manner - their participants were not kindergarteners and they opted to not time the assessment and instead administered all 16 items to each student. This change in administration protocol could have had unintended negative consequences on the scores and the ultimate results in the study. In addition, the authors acknowledge that they changed some of the pictures in the assessment to make the pictures more clear because they learned from pilot testing that many children did not identify the pictures as the DIBELS creators had intended (e.g. saying "bug" instead of the DIBELS intended word "insect" when presented with a picture of a small creature with six legs and wings). This accommodation was a legitimate response to the situation and probably had very little effect on the scores except to ensure that the children were able to correctly reference the pictures.

Beyond the issues with the change in assessment protocol and replacement pictures, there could be further issues with the subtest itself - specifically in that the examiner provides a sound and the child must hold that sound in memory while comparing it with the pictures presented to make a choice. In Flanigan's (2007) study, he utilized two subtests from the PALS-K to assess beginning consonant awareness. The first task was similar to the DIBELS task in that the children were show pictures that each began with a different initial consonant sound. An important difference, however, is that the PALS subtest provided a picture clue for the sound target in addition to the oral statement by the examiner (e.g. shows a picture of a bat and asks the child to identify the picture that began with the same sound as bat). The second subtest involved the child sorting pictures by initial sound. The child was provided with three target pictures that each began with a different sound (e.g. /t/ tent, /p/ pig, /n/ nest). The pictures were named and the initial sounds discussed. The child was then provided 10 picture cards and instructed to place each picture under the target picture that began with the same sound. The inclusion of the second subtest was important because it tested the child's ability to correctly identify the initial sound in each picture and then place it in the correct category. Unlike the DIBELS measures, the children in Flanigan's study had visual representations to help them remember and manipulate the target initial sounds, thus, he might have had greater success in tapping the beginning sound knowledge of the students in his study as compared to Mesmer and Lake. Additionally, the beginning consonant sounds subtest in Flanigan's study had a maximum of 30 points that the students could achieve compared with only 16 in Mesmer and Lake adding further doubt about the use of the DIBELS subtest to assess this beginning consonant sound knowledge.

Need for Further Research

From the review of research just conducted in this area, there are several potential areas for further examination. In most studies, concept of word was viewed in terms of a mastery criterion. A further, more informative view might include a qualitative analysis of student performance on these measures in relation to the stages of concept of word development (developing, rudimentary, and firm). For example, instead of simply viewing students as having mastered concept of word or not, we might attempt to view concept of word development on a continuum and see where and how those other literacy skills develop in tandem. In order to view concept of word on a continuum of development, adjustments would need to be made to the instruments used to assess concept of word. Specifically, researchers would need a way to score pointing in a manner other than simply right or wrong. Fingerpoint reading and the difficulty caused by multisyllabic words is of particular interest here, and a detailed look at the fingerpointing skills in these studies would be beneficial to understand this development and how it relates to the other literacy measures. Additional questions to consider might include: Do children need to know a certain number of letter names before they could be considered developing a concept of word? Is a minimum level of letter sound knowledge necessary to have a rudimentary concept of word? How many letters and/or sounds do children know when their fingerpoint reading strategy is to point using the cadence, beat, and flow of the oral language to point?

A second area for further investigation is related to sight word development. Flanigan's (2007) study indicated that the majority of children in his study did not develop a core sight vocabulary without the mastery of a concept of word. However, there were a small number of children who developed that sight vocabulary without the development of a concept of word. My experience leads me to believe that it probably took an extraordinary amount of time for the adults in those children's lives to help them achieve that sight vocabulary. Rote memorization is likely the key here, and that is an area where many parents feel empowered to help their children succeed. It would be interesting to look at sight word development more closely in relation to the development of a concept of word. What are the school/district requirements for sight word development in kindergarten? How much instructional time is devoted to helping children learn sight words? How much time is spent at home helping children learn sight words? For those students who have not yet mastered a concept of word but have a sight vocabulary -- where are they on the continuum of development for concept of word? Can those same students read unfamiliar connected text independently or do they simply recognize the sight words they have learned?

Chapter 3

Method

This chapter explains how the present study was conducted. First, the research questions are reviewed. Then, the data set and instrument used to collect the data are described. Finally, the data analyses used are explained.

Research Questions

The present study supports previous research into concept of word development by investigating its relationship with other developing literacy skills using a much larger data set than has been used to date. It also extends the research by examining the data by developmental gradations in the growth of children's concept of word instead of viewing concept of word development as mastered or not. Guiding this research are two questions: What are the relationships between concept of word development and other early literacy skills? Can a child's level of concept of word development (developing, rudimentary, full/firm) be predicted by scores on six early literacy measures (rhyme awareness, beginning sound awareness, alphabet knowledge, letter sound knowledge, spelling, and total word recognition in isolation score)?

Description of Data Set and Instrument

The present study utilized existing data from a large literacy improvement program that was coordinated out of a research university in the Western United States. Approximately 4,600 kindergartners from 54 schools in eight counties participated in this project. Assessment data was gathered from administration of the PALS-K, Phonological Awareness Literacy Screening-Kindergarten (Invernizzi, Meier, Swank, & Juel, 2003) and was examined for this study.

Phonological Awareness Literacy Screening-Kindergarten (PALS-K)

Rhyme Awareness and Beginning Sound Awareness. These assessments are administered in small groups of five or fewer students. Items are scored as incorrect (0) or correct (1); 10 items are presented for a possible score of 10. Students not meeting the benchmark score on the assessments are administered an additional individual task (individual rhyme awareness or individual beginning sound awareness) to further investigate the student's difficulty. Items on these tasks are scored in the same manner as the group tasks.

Alphabet Knowledge. In a one-on-one setting, children are asked to identify the lower case letters of the alphabet. Items are scored as incorrect (0) or correct (1) with 26 total points possible.

Letter Sounds. In a one-on-one setting, children are asked to identify the sounds of letters and letter combinations. In this assessment, the letters and letter combinations presented are upper case letters and only short vowel sounds are coded as correct; if a child provides a long vowel sound she is prompted for "the other sound" the letter makes. Items are scored as incorrect (0) or correct (1) with 26 total points possible.

Spelling. Students are asked to spell five words with high-frequency CVC (consonant-vowel-consonant) patterns that are typically encountered in the texts that kindergarteners read (e.g. the word "mat"). Spelling attempts are scored phoneme-by-phoneme, with 1 point possible for each phoneme in each word. Additionally, a "bonus point" is awarded for the correct spelling of any of the five words. This method of scoring yields a possible score of 20 on this subtest.

Concept of Word. Prior to administration of this subtest, students are taught a four-line nursery rhyme using four pictures; accurate and automatic recitation of the rhyme is a necessary prerequisite for the assessment. Individually, the child is asked to point to the text of the memorized rhyme as he recites the rhyme aloud. One point is earned for each line of text that is correctly fingerpoint read; if the child makes an error anywhere on the line, a score of 0 is recorded for that line. After each line of text, the examiner asks the child to identify two pre-selected words from that line of text; the child earns one point per word that is correctly identified. After the child has read the entire text, the child is asked to read aloud a list of 10 words contained in the rhyme; responses are scored as incorrect (0) or correct (1). The total possible points on this subtest are 25. Based on the recommendations in Blackwell-Bullock, et al. (2008-2009), student scores will then be evaluated and classified into one of three developmental categories of concept of word: *developing*, *rudimentary*, and *full* or *firm*. Figure 1 lists the score ranges for each level.

Figure 1
Categories of Concept of Word Development and Corresponding Task and Subtest Scores

Category	**Pointing**	**Word ID in Context**	**Posttest Word List**	**Total**
Developing	0-5	0-5	0-2	0-12
Rudimentary	5	6-9	3-6	13-20
Full/Firm	5	10	7-10	21-25

Word Recognition in Isolation. This subtest was optional and its use was encouraged for those students who met or exceeded the benchmark scores or for students who entered kindergarten as readers. Three lists of 20 words are included: a preprimer list, a primer list, and a first grade word list. Children begin with the preprimer list and continue reading complete lists until they misread 5 or more words. Responses are scored as incorrect (0) or correct (1) with 20 possible points on each list; a total of 60 points is possible across all three lists.

Data Analysis

In the paragraphs below, I restate the research questions, explain their significance, and describe the analyses used for each.

Question 1: What are the relationships between concept of word development and other early literacy skills? In previous studies (Uhry, 1999; Uhry 2002; Flanigan, 2005; Mesmer & Lake, 2010), researchers have investigated the relationships between concept of word development and other early literacy skills. This study investigates those relationships using this data set which is much larger than any used to date. A series of *Pearson correlations* were conducted to test the following: Is there a significant relationship between concept of word development and rhyme awareness, beginning sound awareness, alphabet knowledge, letter sound knowledge, spelling, and word recognition in isolation scores? A *standard multiple regression* was also be conducted to address the following: How accurately do the variables on the PALS-K (rhyme awareness, beginning sound awareness, alphabet knowledge, letter sounds, spelling, and/or word recognition in isolation) predict concept of word scores?

Question 2: Can a child's level of concept of word development (developing, rudimentary, full/firm) be predicted by scores on six early literacy measures (rhyme awareness, beginning sound awareness, alphabet knowledge, letter sound knowledge, spelling, and total word recognition in isolation score)? In all previous studies investigating the development of children's concept of word, the task was viewed as an all or nothing event - children were classified as having or not having a concept of word. The present study offers a novel view by examining children's development of concept of word on a progressive continuum from developing to rudimentary to firm. This will extend and enrich research on concept of word development by offering a more in-depth examination of the data. *Discriminant Analyses* were used to identify which literacy skills (based on PALS-K subtest scores) best predict a student's membership in one of the three developmental groups (developing, rudimentary, or full). All PALS-K subtests - rhyme awareness, beginning sound awareness, alphabet knowledge, letter sound knowledge, spelling, and word recognition in isolation scores - will be used in the analysis. As suggested by Stevens (1992), since the data set used for this analysis is large, to assess the accuracy of the model created by the analysis, approximately one-half of the data set will be used to create the function (the predictive model that describes which subtests reliably and accurately classify children into one of the three developmental COW groups - developing, rudimentary, firm) and the other half of the data will be used to assess the model's accuracy.

Chapter 4

Results

This chapter presents the results of the previously described investigation. The results are presented within the framework of each research question and sub-questions as applicable.

Relationships Between Concept of Word Development and Other Early Literacy Skills

Question 1: What are the relationships between concept of word development and other early literacy skills? 1a: Is there a significant relationship between concept of word development and 1) rhyme awareness, 2) beginning sound awareness, 3) alphabet knowledge, 4) letter sounds, 5) spelling, and 6) word recognition in isolation?

A series of Pearson Product-Moment Correlations were conducted to determine if a significant relationship exists between total concept of word scores and rhyme awareness, beginning sound awareness, alphabet knowledge, letter sound knowledge, spelling, and word recognition in isolation scores (WRI) - preprimer, primer, first grade, and total. Descriptive statistics for all variables involved in these analyses are provided in Table 1.

Table 1

Descriptive Statistics for Variables in the Pearson Product-Moment Correlations

	N	Minimum	Maximum	M	SD
Rhyme Awareness	4581	.0	10.0	8.183	2.6181
Beginning Sound Awareness	4580	0	10	8.17	2.666
Alphabet Knowledge	4581	0	26	22.44	5.798
Letter Sound Knowledge	4581	0	26	18.67	7.121
Spelling	4581	0	20	12.48	6.434
Total Concept of Word Score	4581	0	25	12.97	8.011
Preprimer Word Recognition in Isolation	1997	0	20	9.04	7.044
Primer Word Recognition in Isolation	568	0	20	8.97	6.975
1st grade Word Recognition in Isolation	312	0	20	8.11	7.887
Total Word Recognition in Isolation	4606	0	60	5.58	11.511

Because there were nine planned comparisons in this analysis, it was necessary to control for the increased risk of a Type 1 error - the increased risk of a significant result when it could have occurred by chance. To compensate for this risk, a Bonferroni adjustment was made by dividing the original alpha level of .05 by the number of comparisons made (.05 / 9) suggesting that a more stringent alpha of $p < .005$ be used (Pallant, 2007). Correlations were also evaluated for the strength of the relationships by using Cohen's (1988) system of classifying the relationships as small if $r = .10$ to .29, medium if $r = .30$ to .49, and large if $r = .50$ to 1.0. The results of the correlation analyses presented in Table 2 show that all of the correlations were statistically significant and ranged from medium, positive relationships to large, positive relationships.

Table 2

Pearson Product-Moment Correlations between Total Concept of Word Scores and Other Early Literacy Measures from the PALS-K

	Total Concept of Word Score	Sig. (2-tailed)	N
Preprimer Word Recognition in Isolation	.793	.000	1997
Spelling	.719	.000	4581
First Grade Word Recognition in Isolation	.695	.000	312
Letter Sound Knowledge	.653	.000	4581
Primer Word Recognition in Isolation	.642	.000	568
Beginning Sound Awareness	.539	.000	4580
Alphabet Knowledge	.539	.000	4581
Total Word Recognition in Isolation Score	.504	.000	4581
Rhyme Awareness	.426	.000	4581

In addition, the amount of variance in total concept of word scores explained by each variable was assessed by calculating a coefficient of determination. Each correlation was squared and multiplied by 100 and is listed in Table 3.

Table 3

Coefficients of Determination for Variables in the Pearson Product-Moment Correlations between Total Concept of Word Scores and Other Early Literacy Measures from the PALS-K

	Total Concept of Word Score	Variance
Preprimer Word Recognition in Isolation	.793	63%
Spelling Score	.719	52%
First Grade Word Recognition in Isolation	.695	48%
Letter Sound Knowledge	.653	43%
Primer Word Recognition in Isolation	.642	41%
Beginning Sound Awareness	.539	29%
Alphabet Knowledge	.539	29%
Total Word Recognition in Isolation Score	.504	25%
Rhyme Awareness	.426	18%

Question 1: What are the relationships between concept of word development and other early literacy skills? 1b: How accurately do the variables on the PALS-K (rhyme

awareness, beginning sound awareness, alphabet knowledge, letter sounds, spelling, and/or word recognition in isolation) predict concept of word scores?

To determine how accurately the six literacy measures on the PALS-K, rhyme awareness, beginning sound awareness, alphabet knowledge, letter sound knowledge, spelling, and total word recognition in isolation scores, would predict the total concept of word scores, a standard multiple regression analysis was conducted. Data screening indicated that the data set contained extreme outliers. According the data screening, the maximum value for Mahalanobis Distance was set at 43.126. To identify which cases were outliers, a critical chi-square value of 22.46 was determined using an alpha level of .001 and the criteria of 6 degrees of freedom, based on the number of independent variables in the analysis (Pallant, 2007). Cases were then sorted by the Mah_1 variable created during the analysis and 101 cases were identified having a Mahalanobis Distance of 22.46 or greater. Since these cases represented only 2% of the data set, they were deleted, and the analysis completed again. The data were screened again and showed no outliers or other violations of the assumptions. As shown in Table 4 and Table 5, the combination of the literacy measures was significantly related to total concept of word scores, R^2 = .596, adjusted R^2 = .595, F (6, 4472) = 1099.356, $p < .005$. This indicates that approximately 60% of the variance in total concept of word scores can be explained by the six literacy measures.

Table 4

Multiple Regression Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.772[a]	.596	.595	5.083

a. Predictors: (Constant), Total Word Recognition in Isolation Score, Rhyme Awareness, Alphabet Knowledge, Beginning Sound Awareness, Spelling, Letter Sound Knowledge

b. Dependent Variable: Total Concept of Word Score

Table 5

ANOVA[b] for Multiple Regression Analysis

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	170416.787	6	28402.798	1099.356	.000[a]
	Residual	115537.917	4472	25.836		
	Total	285954.705	4478			

a. Predictors: (Constant), Total Word Recognition in Isolation Score, Rhyme Awareness, Alphabet Knowledge, Beginning Sound Awareness, Spelling, Letter Sound Knowledge

b. Dependent Variable: Total Concept of Word Score

A summary of regression coefficients is presented in Table 6. These results indicate that six of the seven variables significantly contributed to the model; only alphabet knowledge did not (β = -.032, *t* (-1.814), *p* = .070).

Table 6

Predictors of Total Concept of Word Score

	Unstandardized Coefficients		Standardized Coefficients		
Variable	B	Std. Error	Beta	t	Sig.
Rhyme Awareness	.186	.039	.059	4.773	.000
Beginning Sound Awareness	.326	.045	.105	7.282	.000
Alphabet Knowledge	-.045	.025	-.032	-1.814	.070
Letter Sound Knowledge	.219	.024	.192	9.177	.000
Spelling	.501	.020	.402	24.782	.000
Total Word Recognition in Isolation	.168	.008	.228	21.540	.000

Developmental Gradations in Concept of Word and Early Literacy Skills

Question 2: Can a child's level of concept of word development (developing, rudimentary, full/firm) be predicted by scores on six early literacy measures (rhyme awareness, beginning sound awareness, alphabet knowledge, letter sound knowledge, spelling, and total word recognition in isolation score)?

A stepwise discriminant analysis was conducted to determine if, and how accurately, a child's level of concept of word development (developing, rudimentary, full/firm) could be predicted from scores on six early literacy measures on the PALS-K - rhyme awareness, beginning sound awareness, alphabet knowledge, letter sound knowledge, spelling, and total word recognition in isolation scores. Prior to the analysis, students' total concept of word scores were examined based on the recommendations in Blackwell-Bullock, et al. (2008-2009) and then coded as belonging to one of three developmental categories: 1=*developing* concept of word, 2=*rudimentary* concept of word, or 3=*full/firm* concept of word. (See Figure 1 in Chapter 3 for task and subtest scores used to make these classifications.) In addition, the data were screened, and based on the results of the Mahalanobis Distance calculations (critical $\chi^2 = 22.46$, $p < .001$) described in the multiple regression analysis above, 101 cases were identified as outliers. Because discriminant analysis results are negatively affected by the presence of outliers, and because these 101 cases represented a very small portion of the total data set (2%), they were eliminated from the analysis (Mertler &Vannatta, 2005).

Since the goal of the discriminant analysis was to attempt to build a model that successfully predicted a student's level of concept of word development, it was necessary to assess the accuracy of the model's classifications, also known as the model's hit rate

(Mertler & Vannatta, 2005). Although the statistical software SPSS provided an assessment of the adequacy of classifications using the same sample used to develop the discriminant function equation, Stevens (1992) has argued that this method results in a misleading assessment of the model. Instead, he suggests that if the sample is large enough, it be split in half so that part of the original data set is used to construct the function and the other part of the data set is used to assess its accuracy. Since the data set used for this analysis contained more than 4,000 subjects, Stevens' suggestion was followed and the data were split in half. Table 7 shows the descriptive statistics for each of the two groups.

Table 7
Discriminant Analysis - Group Statistics After Data Split in Half

	Group	N	M	SD	Std. Error Mean
Total	Build (Group 1)	2240	12.99	7.910	.167
Concept of Word Score	Test (Group 2)	2240	12.94	8.073	.171

In addition, it was necessary to verify that the two newly created groups did not significantly differ from one another. To assess initial group differences, an independent-samples t-test was conducted to see if there was a statistically significant difference between the mean scores for the two groups. As shown in Table 8, Levene's Test for Equality of Variances was not significant indicating that there was not a significant difference between the two groups.

Table 8
Independent Samples Test for Data Split into Groups

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Total Concept of Word Score	Equal variances assumed	3.114	.078	.208	4478	.836
	Equal variances not assumed			.208	4476.153	.836

Building the Model. As shown in Table 9, the "model" Wilks' Lambda analysis generated two significant functions - function 1: Λ = .465, χ^2 (10, N = 2239) = 1711.101, p < .001 and function 2: Λ =.940, χ^2 (4, N = 2239) = 139.224, p < .001 - indicating that function of predictors significantly differentiated between children's level of concept of word development (1=*developing* concept of word, 2=*rudimentary* concept of word, or 3=*full/firm* concept of word). In addition, the Eigenvalues in Table 10 indicated that this developmental gradation in concept of word development accounted for 51% of variance in function 1 and 6% of variance in function 2.

Table 9
Building the Model - Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 2	.465	1711.101	10	.000
2	.940	139.224	4	.000

Table 10
Building the Model - Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	1.021[a]	94.1	94.1	.711
2	.064[a]	5.9	100.0	.246

a. First 2 canonical discriminant functions were used in the analysis.

Five variables were entered into the function by the statistical software: spelling, total word recognition in isolation, letter sound knowledge, beginning sound awareness, and alphabet knowledge; rhyme awareness scores were not entered into the model. Standardized function coefficients and correlation coefficients (see Table 11 and Table 12) revealed that spelling and total word recognition in isolation were most associated with function 1 and total word recognition in isolation was most associated with function 2. Based on these results function 1 was labeled COW/Spell-WRI and function 2 was labeled COW/WRI.

Table 11 - *Building the Model*
Function 1: Correlation Coefficients and Standardized Function Coefficients

	Correlation Coefficients with Discriminant Function	Standardized Function Coefficients
Spelling	.851	.560
Total Word Recognition in Isolation	.575	.437
Letter Sound Knowledge	.724	.353
Beginning Sound Awareness	.561	.176
Alphabet Knowledge	.517	-.158

Table 12 - *Building the Model*
Function 2: Correlation Coefficients and Standardized Function Coefficients

	Correlation Coefficients with Discriminant Function	Standardized Function Coefficients
Total Word Recognition in Isolation	.787	.865
Alphabet Knowledge	-.486	-.223
Letter Sound Knowledge	-.434	-.188
Spelling	-.353	-.176
Beginning Sound Awareness	-.393	-.171

Model classification results (as shown in Table 13) revealed that 81% of students who had a *developing* concept of word were correctly classified, 54% of students who had a *rudimentary* concept of word were correctly classified, and 52% of students with a *full/firm* concept of word were correctly classified. For the overall sample, 66.8% were correctly classified. SPSS cross-validation derived 66.7% accuracy for the total sample.

Table 13
Building the Model - Classification Results[b,c]

		Concept of Word Level	Predicted Group Membership 1	2	3	Total
Original	Count	1=developing	889	194	17	1100
		2=rudimentary	159	319	108	586
		3=full/firm	29	236	288	553
	%	1=developing	80.8	17.6	1.5	100.0
		2=rudimentary	27.1	54.4	18.4	100.0
		3=full/firm	5.2	42.7	52.1	100.0
Cross-validated[a]	Count	1=developing	888	195	17	1100
		2=rudimentary	160	318	108	586
		3=full/firm	30	235	288	553
	%	1=developing	80.7	17.7	1.5	100.0
		2=rudimentary	27.3	54.3	18.4	100.0
		3=full/firm	5.4	42.5	52.1	100.0

a. Cross validation is done only for those cases in the analysis. In cross validation, each case is classified by the functions derived from all cases other than that case.
b. 66.8% of original grouped cases correctly classified.
c. 66.7% of cross-validated grouped cases correctly classified.

The means of the discriminant functions (shown in Table 14) are consistent with these results. Children with a *developing* concept of word had function means of -.963 and .090, children with a rudimentary concept of word had function means of .452 and -.410, and children with a *full/firm* concept of word had function means of 1.438 and .256. These results suggest that children with low word recognition in isolation scores and low spelling scores were likely to be classified as having a *developing* concept of word and those with moderate to high word recognition in isolation scores and those with moderate to high spelling scores were likely to be classified as either having a *rudimentary* or *full/firm* concept of word.

Table 14

Building the Model: Functions at Group Centroids

Concept of Word Level	Function 1	Function 2
1=developing	-.963	.090
2=rudimentary	.452	-.410
3=full/firm	1.438	.256

Unstandardized canonical discriminant functions evaluated at group means

Testing the Model. As shown in Table 15, the "test" Wilks' Lambda analysis generated two significant functions - function 1: $\Lambda = .466$, $\chi^2(12, N = 2240) = 1706.669$, $p < .001$ and function 2: $\Lambda = .941$, $\chi^2(5, N = 2240) = 136.893$, $p < .001$, indicating that function of predictors significantly differentiated between children's level of concept of word development. In addition, the "test" Eigenvalues in Table 16 indicated that this developmental gradation in concept of word development accounted for 51% of variance in function 1 and 6% of variance in function 2. These results were almost identical results to the "build" Wilks' Lambda (see Table 9) confirming that the model's function of predictors significantly differentiated between children's level of concept of word development (1=*developing* concept of word, 2=*rudimentary* concept of word, or 3=*full/firm* concept of word).

Table 15

Testing the Model - Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 2	.466	1706.669	12	.000
2	.941	136.893	5	.000

Table 16
Testing the Model - Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	1.019[a]	94.2	94.2	.710
2	.063[a]	5.8	100.0	.244

a. First 2 canonical discriminant functions were used in the analysis.

In contrast to the model analysis, in this test analysis the statistical software entered all six variables into the function: spelling, total word recognition in isolation, letter sound knowledge, beginning sound awareness, and alphabet knowledge, and rhyme awareness. Once again, standardized function coefficients and correlation coefficients (see Table 17 and Table 18) confirmed that spelling and total word recognition in isolation score were most associated with function 1 and total word recognition in isolation score was most associated with function 2. Based on these results the function labels from the "model" analysis were retained.

Table 17 - *Testing the Model*
Function 1: Correlation Coefficients and Standardized Function Coefficients

	Correlation Coefficients with Discriminant Function	Standardized Function Coefficients
Spelling	.848	.550
Total Word Recognition in Isolation	.581	.436
Letter Sound Knowledge	.728	.352
Beginning Sound Awareness	.551	-.156
Alphabet Knowledge	.529	.118
Rhyme Awareness	.402	.104

Table 18- *Testing the Model*
Function 2: Correlation Coefficients and Standardized Function Coefficients

	Correlation Coefficients with Discriminant Function	Standardized Function Coefficients
Total Word Recognition in Isolation	.747	.805
Alphabet Knowledge	-.511	-.381
Beginning Sound Awareness	-.481	-.379
Spelling	-.360	-.190
Rhyme Awareness	-.153	.129
Letter Sound Knowledge	-.382	.071

Classification results from the test analysis (as shown in Table 19) were very similar to the model analysis (shown in Table 13). This test analysis revealed that 80% of students who had a *developing* concept of word were correctly classified, 52% of students who had a *rudimentary* concept of word were classified, and 51% of students with a *full/firm* concept of word were correctly classified. For the overall sample, 65.4% were correctly classified. SPSS cross-validation derived 65.3% accuracy for the total sample.

Table 19

Testing the Model - Classification Results[b,c]

		Concept of Word Level	Predicted Group Membership 1	2	3	Total
Original	Count	1=developing	879	205	15	1099
		2=rudimentary	163	304	120	587
		3=full/firm	31	240	283	554
	%	1=developing	80.0	18.7	1.4	100.0
		2=rudimentary	27.8	51.8	20.4	100.0
		3=full/firm	5.6	43.3	51.1	100.0
Cross-validated[a]	Count	1=developing	877	205	17	1099
		2=rudimentary	164	303	120	587
		3=full/firm	31	240	283	554
	%	1=developing	79.8	18.7	1.5	100.0
		2=rudimentary	27.9	51.6	20.4	100.0
		3=full/firm	5.6	43.3	51.1	100.0

a. Cross validation is done only for those cases in the analysis. In cross validation, each case is classified by the functions derived from all cases other than that case.
b. 65.4% of original grouped cases correctly classified.
c. 65.3% of cross-validated grouped cases correctly classified.

The means of the discriminant functions are consistent with these results. As shown in Table 20, children with a *developing* concept of word had function means of -.965 and .088, children with a rudimentary concept of word had function means of .456 and -.406, and children with *full/firm* concept of word had function means of 1.431 and .255. These results suggest that children with low word recognition in isolation scores and low spelling scores were likely to be classified as having a *developing* concept of word and those with moderate to high word recognition in isolation scores and those with moderate to high spelling scores were likely to be classified as either having a *rudimentary* or *full/firm* concept of word.

Table 20

Testing the Model: Functions at Group Centroids

Concept of Word Level	Function	
	1	2
1=developing	-.965	.088
2=rudimentary	.456	-.406
3=full/firm	1.431	.255

Unstandardized canonical discriminant functions evaluated at group means

Although not an originally planned analysis, the relative importance of total word recognition in isolation scores in the above analysis prompted the researcher to conduct an additional, finer-tuned discriminant analysis. To calculate the total word recognition in isolation scores for the above analysis, the scores from the preprimer word list, primer word list, and first grade word list were added together. This necessitated recoding a score of zero for any instance that a score was not recorded in the data. The nature of the PALS-K assessment supported this decision as the assessment only asked teachers to record scores on the word lists if the criteria listed in the assessment were met or if the teachers wanted this piece of assessment data. In other words, for those cases where a score for one or more of the word lists was not entered, based on assessment criteria, it was assumed that the children would not have been able to read the words (Invernizzi, et al., 2003). An examination of the data showed that approximately 1,900 children had scores recorded for the preprimer word list, 350 the primer word list, and 285 the first grade word list. This decline in reported scores as the word lists became more difficult was expected since kindergartners' reading levels are most associated with the preprimer level (Invernizzi, et al., 2003). In this new analysis, preprimer word recognition in isolation scores were entered into the discriminant analysis instead of the total word recognition in isolation scores so that a more accurate model might be created.

Building the New Model. As shown in Table 21, the "new model" Wilks' Lambda analysis generated two significant functions - function 1: $\Lambda = .352$, $\chi^2\,(8, N = 978) = 1016.153$, $p < .001$ and function 2: $\Lambda = .940$, $\chi^2\,(2, N = 978) = 60.408$, $p < .001$ - indicating that the function of predictors significantly differentiated between children's level of concept of word development (1=*developing* concept of word, 2=*rudimentary* concept of word, or 3=*full/firm* concept of word). In addition, the Eigenvalues in Table 22 indicated that this developmental gradation in concept of word development accounted for approximately 63% of variance in function 1 and 6% of variance in function 2.

Table 21
Building the New Model - Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 2	.352	1016.153	8	.000
2	.940	60.408	2	.000

Table 22
Building the New Model - Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	1.669[a]	96.3	96.3	.791
2	.064[a]	3.7	100.0	.245

a. First 2 canonical discriminant functions were used in the analysis.

Four variables were entered into the function by the statistical software: preprimer word recognition in isolation, spelling, alphabet knowledge, and beginning sound awareness; rhyme awareness scores and letter sound knowledge scores were not entered into the model. Standardized function coefficients and correlation coefficients (see Table 23 and Table 24) revealed that the variable of preprimer word recognition in isolation was most associated with function 1 and function 2. Based on these results the functions were labeled COW/PP-WRI.

Table 23 - *Building the New Model*
Function 1: Correlation Coefficients and Standardized Function Coefficients

	Correlation Coefficients with Discriminant Function	Standardized Function Coefficients
Preprimer Word Recognition in Isolation	.940	.793
Spelling	.665	.284
Beginning Sound Awareness	.438	.124
Alphabet Knowledge	.421	.029

Table 24 - *Building the New Model*
Function 2: Correlation Coefficients and Standardized Function Coefficients

	Correlation Coefficients with Discriminant Function	Standardized Function Coefficients
Preprimer Word Recognition in Isolation	-.311	-.703
Alphabet Knowledge	.694	.560
Spelling	.588	.521
Beginning Sound Awareness	.481	.179

Classification results (as shown in Table 25) from this new model revealed that 79% of students who had a *developing* concept of word were correctly classified, 54% of students who had a *rudimentary* concept of word were correctly classified, and 79.3% of students with a *full/firm* concept of word were correctly classified. For the overall sample, 71.7% were correctly classified. SPSS cross-validation derived 71.3% accuracy for the total sample.

Table 25

Building the New Model - Classification Results[b,c]

		Concept of Word Level	Predicted Group Membership			Total
			1	2	3	
Original	Count	1=developing	279	66	8	353
		2=rudimentary	50	157	84	291
		3=full/firm	8	61	265	334
	%	1=developing	79.0	18.7	2.3	100.0
		2=rudimentary	17.2	54.0	28.9	100.0
		3=full/firm	2.4	18.3	79.3	100.0
Cross-validated[a]	Count	1=developing	278	67	8	353
		2=rudimentary	53	154	84	291
		3=full/firm	8	61	265	334
	%	1=developing	78.8	19.0	2.3	100.0
		2=rudimentary	18.2	52.9	28.9	100.0
		3=full/firm	2.4	18.3	79.3	100.0

a. Cross validation is done only for those cases in the analysis. In cross validation, each case is classified by the functions derived from all cases other than that case.
b. 71.7% of original grouped cases correctly classified.
c. 71.3% of cross-validated grouped cases correctly classified.

The means of the discriminant functions, shown in Table 26, are consistent with these results. Children with a *developing* concept of word had function means of -1.548 and -.145, children with a rudimentary concept of word had function means of .127 and .387, and children with *full/firm* concept of word had function means of 1.525 and -.184. These results suggest that children with low preprimer word recognition in isolation scores were likely to be classified as having a *developing* concept of word and those with high preprimer word recognition in isolation scores were likely to be classified as having a *full/firm* concept of word.

Table 26

Building the New Model: Functions at Group Centroids

Concept of Word Level	Function	
	1	2
1=developing	-1.548	-.145
2=rudimentary	.127	.387
3=full/firm	1.525	-.184

Unstandardized canonical discriminant functions evaluated at group means

Testing the New Model. As shown in Table 27, the new “test" Wilks' Lambda analysis generated two significant functions - function 1: Λ = .466, χ^2 (12, N = 2240) = 1706.669, p < .001 and function 2: Λ = .941, χ^2 (5, N = 2240) = 136.893, p < .001, indicating that the function of predictors significantly differentiated between children's level of concept of word development. In addition, the new "test" Eigenvalues in Table 28 indicated that this developmental gradation in concept of word development accounted for 61% of the variance in function 1 and 7% of variance in function 2. These results were almost identical results to the new "build" Wilks' Lambda (see Table 21) confirming that the model's function of predictors significantly differentiated between children's level of concept of word development (1=*developing* concept of word, 2=*rudimentary* concept of word, or 3=*full/firm* concept of word).

Table 27

Testing the New Model - Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 2	.362	984.179	8	.000
2	.933	67.416	3	.000

Table 28

Testing the New Model - Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	1.574[a]	95.6	95.6	.782
2	.072[a]	4.4	100.0	.259

a. First 2 canonical discriminant functions were used in the analysis.

As in the new "build" analysis, four variables were entered into the test function by the statistical software; however, the four variables differed in that letter sound knowledge replaced alphabet knowledge in the new test model. (Variables used in the new test model: preprimer word recognition in isolation, spelling, letter sound knowledge, and beginning sound awareness; variables not used in the new test model: rhyme awareness and alphabet knowledge scores). Standardized function coefficients and correlation coefficients (see Table 29 and Table 30) from the new test model confirmed that the variable of preprimer word recognition in isolation continued to be the most associated with both functions; therefore, the function labels from the new model analysis were retained.

Table 29 - *Testing the New Model*

Function 1: Correlation Coefficients and Standardized Function Coefficients

	Correlation Coefficients with Discriminant Function	Standardized Function Coefficients
Preprimer Word Recognition in Isolation	.944*	.785
Beginning Sound Awareness	.480	.160
Spelling	.660*	.152
Letter Sound Knowledge	.616*	.132

Table 30- *Testing the New Model*
Function 2: Correlation Coefficients and Standardized Function Coefficients

	Correlation Coefficients with Discriminant Function	Standardized Function Coefficients
Preprimer Word Recognition in Isolation	-.328	-.766
Beginning Sound Awareness	.669	.499
Letter Sound Knowledge	.578	.464
Spelling	.488	.299

Classification results from the new test analysis (as shown in Table 31) were very similar to the new model analysis (shown in Table 25). This new test analysis revealed that 72% of students who had a *developing* concept of word were correctly classified, 53% of students who had a *rudimentary* concept of word were correctly classified, and 83% of students with a *full/firm* concept of word were correctly classified. For the overall sample, 69.7% were correctly classified. SPSS cross-validation derived 69.3% accuracy for the total sample.

Table 31
Testing the New Model - Classification Results[b,c]

		Concept of Word Level	Predicted Group Membership			
			1	2	3	Total
Original	Count	1=developing	236	80	11	327
		2=rudimentary	56	163	91	310
		3=full/firm	5	52	280	337
	%	1=developing	72.2	24.5	3.4	100.0
		2=rudimentary	18.1	52.6	29.4	100.0
		3=full/firm	1.5	15.4	83.1	100.0
Cross-validated[a]	Count	1=developing	235	81	11	327
		2=rudimentary	58	160	92	310
		3=full/firm	6	51	280	337
	%	1=developing	71.9	24.8	3.4	100.0
		2=rudimentary	18.7	51.6	29.7	100.0
		3=full/firm	1.8	15.1	83.1	100.0

a. Cross validation is done only for those cases in the analysis. In cross validation, each case is classified by the functions derived from all cases other than that case.
b. 69.7% of original grouped cases correctly classified.
c. 69.3% of cross-validated grouped cases correctly classified.

The means of the discriminant functions, shown in Table 32, are consistent with these results. Children with a *developing* concept of word had function means of -1.568 and -.172, children with a rudimentary concept of word had function means of .061 and .392, and children with *full/firm* concept of word had function means of 1.466 and -.194. These results suggest that children with low preprimer word recognition in isolation scores were likely to be classified as having a *developing* concept of word and those with high preprimer word recognition in isolation scores were likely to be classified as having a *full/firm* concept of word.

Table 32

Testing the New Model: Functions at Group Centroids

Concept of Word Level	Function	
	1	2
1=developing	-1.568	-.172
2=rudimentary	.061	.392
3=full/firm	1.466	-.194

Unstandardized canonical discriminant functions evaluated at group means

Chapter 5

Discussion

This study examined the relationships between concept of word development and other early literacy measures (rhyme awareness, beginning sound awareness, alphabet knowledge, letter sound knowledge, spelling, and word recognition in isolation) using data from the PALS-K. Supporting previous research by using a much larger data set than had been used to date, Pearson Product-Moment correlations were used to describe the relationships between total concept of word scores and the literacy measures and multiple regression analysis were used to examine the ability of the literacy measures to predict total concept of word scores. Extending previous research, this study examined the developmental gradations in children's concept of word, a novel approach to examining concept of word data. Discriminant Analyses were used to build and test a model to identify the literacy measures from the PALS-K that best predict a child's level of concept of word development – developing, rudimentary, or firm. In the sections that follow, results of the analyses conducted for each of the research questions will be interpreted and instructional implications addressed, limitations of this study will be identified, and suggestions for future research will be made.

Relationships Between Concept of Word Development and Other Early Literacy Skills

The first question asked in this study was: *What are the relationships between concept of word development and other early literacy skills?* This question was followed by two sub-questions, specifically: *Is there a significant relationship between concept of word development and rhyme awareness, beginning sound awareness,* *alphabet knowledge, letter sounds, spelling, and word recognition in isolation?* and *How accurately do the variables on the PALS-K (rhyme awareness, beginning sound awareness, alphabet knowledge, letter sounds, spelling, and/or word recognition in isolation) predict concept of word scores?* To address the first sub-question a series of Pearson Product-Moment correlations were conducted. Pearson correlation coefficients are reported on a scale -1 to +1, with the absolute value (ignoring the sign) providing an indication as to the strength of the relationship between the variables. A perfect correlation (1 or -1) indicates that the value of one variable can be determined exactly by knowing the value of the other variable; in contrast, a correlation of 0 indicates that there is no relationship, whatsoever, between the two variables. The PALS-K, was designed to be a comprehensive tool to identify students who are at-risk of reading difficulties. A substantial body of research indicates that the PALS-K literacy tasks are robust predictors of later literacy achievement in children. As such, it was hypothesized that total concept of word scores would be highly correlated with the scores on the other subtasks.

As anticipated, all literacy measures were significantly correlated with total concept of word scores. The correlations ($p < .001$) in this study's analyses ranged from a low of .426 for the relationship between rhyme awareness and total concept of word scores to a high of .79 for the relationship between preprimer word recognition in isolation and total concept of word scores. In previous studies (see Uhry, 1999; Uhry, 2002; Mesmer & Lake, 2010), total concept of word scores showed medium to strong correlations with measures of alphabet knowledge, spelling, and word identification. This study supported those findings in the following ways. First, the correlation between total concept of word scores and alphabet knowledge was calculated at .539 (correlation ranged from .47 to .56 in previous studies). Second, the correlation between total concept of word scores and spelling was calculated at .719 (correlation ranged from .66 to .67 in previous studies). Finally, the correlation between measures of total concept of word scores and word identification was calculated at .79 (correlation ranged from .41 to .58 in previous studies). The relative increase in correlations between total concept of word scores and the variables of preprimer word recognition in isolation and spelling is of particular note and an important finding from this study. The increase may be explained in a few ways. First, the data set used for this analysis was much larger than the data sets used to date in concept of word studies thus allowing for many additional instances to compare scores and check for relationships between the variables. Additionally, the nature of the subtests likely had an effect on the scores obtained on the measures. For example, in previous studies (specifically Uhry 1999 & 2002), the researcher used spelling tasks created specifically for each study. The PALS-K's spelling task, in contrast, was developmental in nature and constructed specifically to tap students' emerging ability to represent phonemes in CVC words. The word identification tasks also differed in the studies. In Uhry's 2002 study, word identification scores were obtained from administration of the Word Identification subtest of the Woodcock Reading Mastery Tests which does not report kindergarten reliability data. Mesmer and Lake (2010) used words from a preprimer word list; however, they only asked children to read 10 words whereas the PALS-K asks children to read 20 words. This increase in the score range on the subtest likely had an impact on the resulting correlations.

The present study was also somewhat unique in that it conducted correlations between total concept of word scores and rhyme awareness, beginning sound awareness, and letter sound knowledge – three measures not commonly examined in concept of word studies. While not the strongest correlations in the study, the relationships between these variables and total concept of word score was established. The correlation with rhyme awareness was the smallest in the study ($r = .426$, $p < .001$); however, it was still a medium correlation that accounted for 18% of the variability in concept of word scores. Letter sounds and beginning sound awareness correlations were large, accounting for 43% and 29% of the variance in concept of word scores respectively.

To address the second sub-question (*How accurately do the variables on the PALS-K (rhyme awareness, beginning sound awareness, alphabet knowledge, letter sounds, spelling, and/or word recognition in isolation) predict concept of word scores?*) a multiple regression analysis was conducted. The data from the previous analysis indicated that all subtest measures from the PALS-K were significantly correlated with total concept of word scores. Knowing this, a standard multiple regression was conducted to determine how much variance in total concept of word scores could be predicted or explained by the six literacy subtests as a group. In standard multiple regression, all the predictor variables are entered into the equation simultaneously and each one is evaluated in terms of its predictive power – above and beyond that offered by all of the other predictor variables combined. The resulting analysis also shows how much unique variance in concept of word scores each of the literacy measure explains.

The standard multiple regression conducted in this study did in fact show that the group of measures successfully predicted total concept of word scores. In fact, approximately 60% of variation in concept of word scores can be explained by the combination of literacy measures. Of the overall 60% variation in total concept of word scores explained by the literacy measures, part correlation coefficients indicate that spelling made the largest unique contribution (12%), followed by total word recognition in isolation (9%), letter sound knowledge (6%), beginning sound awareness (1%), and rhyme awareness (1%). Alphabet knowledge was the only variable that did not contribute significant unique additional variance to the model (β = -.032, *t*(-1.814), *p* = .070). At first, this might seem surprising, but considering the developmental relationships among the variables it makes sense that not every variable would contribute significant, unique variance to the equation when ALL subtests are entered.

Previous studies have used hierarchical multiple regression to determine if specific measures account for unique variance beyond other measures. For example, Uhry wondered whether spelling accounted for unique variance in concept of word scores beyond the contributions made by alphabet knowledge and phonological measures. She found that spelling contributed approximately 14% of unique variance to concept of word scores – a finding that is very similar to the present study (12%). However, none of the previous studies have conducted standard multiple regressions as the present study did. This analysis allowed us to determine that spelling contributes the most unique variance in word recognition in isolation scores followed by total word recognition in isolation scores – a variable not previously examined in the equation.

Developmental Gradations in Concept of Word and Early Literacy Skills

The second question asked in this study was*: Can a child's level of concept of word development (developing, rudimentary, full/firm) be predicted by scores on six early literacy measures (rhyme awareness, beginning sound awareness, alphabet knowledge, letter sound knowledge, spelling, and total word recognition in isolation)?* To answer this question, a discriminant analysis was conducted. As the previous two analysis indicated strong relationships between all PALS-K literacy measures and total concept of word scores, including the ability for the group of variables to predict 60% of variation in total concept of word scores, it was hypothesized that a child's level of concept of word development could be predicted by the scores on the six subtests. The goal in discriminant analysis is to determine dimensions or measures that can be used to reliably and accurately classify students into groups. In the present study, students' total concept of word scores were examined and then classified as 1=*developing* concept of word, 2=*rudimentary* concept of word, or 3=*full/firm* concept of word based on the recommendations in Blackwell-Bullock, et al. (2008-2009). The discriminant analysis in this study used the scores on the six early literacy measures (rhyme awareness, beginning sound awareness, alphabet knowledge, letter sound knowledge, spelling, and total word recognition in isolation) in an attempt to predict this same classification. There are three basic types of discriminant analyses - 1) standard or direct discriminant analysis where each predictor variable is entered into the equation simultaneously, 2) sequential or hierarchical discriminant analysis where the predictor variables are entered into the analysis in the order specified by the researcher, and 3) stepwise or statistical discriminant analysis where the order of entry of each predictor variable is determined by using statistical criteria, and a reduced set of predictors is obtained because only those with statistical significance are used in the equation. The present study utilized the stepwise discriminant analysis because the goal of this analysis was exploratory in nature - to determine the ability of the six PALS-K measures to predict a child's level of concept of word development.

The results of the analysis indicate that a child's level of concept of word development can, in fact, be predicted by the linear combination of variables. The initial analysis, used to build the predictive model, selected the following variables for the function equations: rhyme awareness, letter sound knowledge, spelling, and total word recognition in isolation; beginning sound awareness and alphabet knowledge were not included as they did not contribute to the model beyond the contributions of the other variables. In this initial build analysis, total word recognition in isolation scores and spelling scores were most associated with the functions generated and the model created correctly classified 66.8% of students into the correct developmental groups. Specifically, the model correctly classified 81% of those with *developing* concepts of word, 54% of those with *rudimentary* concepts of word, and 52% of those with *full/firm* concepts of word. A test of the model was also conducted revealing very similar results - the model correctly classified 80% of those with *developing* concepts of word, 52% of those with *rudimentary* concepts of word, and 51% of those with *full/firm* concepts of word. The relative strength of total word recognition in isolation scores in the predictive model was a surprise as was the variation in the model's ability to accurately predict each group. While statistically significant, those with developing concepts of word were predicted confidently, while those with rudimentary and full/firm concepts of word were predict just slightly better than one could by chance (e.g. flipping a coin would correctly classify 50% of the students into those two groups once those with developing concepts of word were classified). Examination of the most heavily weighted variable, total word recognition in isolation scores, revealed a mean of 5.343, which is quite low considering the highest possible score on this variable was 60. To calculate the total word recognition in isolation scores for the above analysis, the scores from the preprimer word list, primer word list, and first grade word list were added together. This necessitated recoding a score of zero for any instance that a score was not recorded in the data. The nature of the PALS-K assessment supported this decision as the assessment only asked teachers to record scores on the word lists if the criteria listed in the assessment were met or if the teachers wanted this piece of assessment data. In other words, for those cases where a score for one or more of the word lists was not entered, based on assessment criteria, it was assumed that the children would not have been able to read the words (Invernizzi, et al., 2003). Since this variable was so heavily weighted in the analysis, this assumption and method of calculating the total concept of word scores might have had a impact on the model's lower ability to predict those with rudimentary and full/firm concept of word scores than those with developing concept of word scores.

Although not an originally planned analysis, the relative importance of total word recognition in isolation scores in the preceding analysis prompted the researcher to conduct an additional, finer-tuned discriminant analysis using preprimer word recognition in isolation scores instead of total word recognition in isolation scores. This way, the word recognition in isolation variable would be more accurate in that it represented actual student performance on the measure. Once again, the results of the analysis indicated that a child's level of concept of word development can, in fact, be predicted by the linear combination of variables. The initial analysis, used to build the predictive model, selected the following variables for the function equations: rhyme awareness, alphabet knowledge, spelling, and preprimer word recognition in isolation; beginning sound awareness and letter sound knowledge were not included as they did not contribute to the model beyond the contributions of the other variables. In this new build analysis, preprimer word recognition in isolation scores were most associated with the functions generated and the model created correctly classified 71.7% of students into the correct developmental groups. Specifically, the model correctly classified 79% of those with *developing* concepts of word, 54% of those with *rudimentary* concepts of word, and 79% of those with *full/firm* concepts of word. Thus, the use of preprimer word recognition in isolation scores boosted the model's ability to correctly classify students as having a full/firm concept of word.

No known studies have analyzed concept of word scores from this developmental perspective or attempted to use common literacy measures to predict levels of concept of word development. The present study is a first step in this process. Word recognition in isolation scores using graded word lists appear to be a powerful predictor of a student's concept of word (as shown in the regression analysis and discriminant analysis above). This makes sense considering that developing a concept of word is a precursor to "real" reading. Early in literacy development, a child is simply developing her awareness of words in print. When asked to track text, she may demonstrate her lack of familiarity with print concepts and directionality by pointing to the pictures or other places on the page as she recites the text (Blackwell-Bullock, 2008-2009). A child who is in the developing stage might also show directionality and read with a sweeping gesture. As the child begins to develop more mature literacy behaviors, his grasp of the concept of word in text is rudimentary (Morris, 1993). This simply means that he can track some text accurately, but makes mistakes. A child with a rudimentary concept of word can point to most single syllable words accurately, but experiences difficulty with multi-syllabic words. At first, the child will point to a separate word for each syllable uttered and will "run out" of words on the page. The child realizes that he made an error in tracking, and is often able to self-correct (Blackwell-Bullock, 2008-2009). This same child may be able to identify some words in the context of the text being read from memory, but is unlikely to recognize the same words in isolation (Blackwell-Bullock, 2008-2009). In contrast, a child with a full concept of word can easily self-correct errors and accurately point to the text as he recites the memorized words. He can also identify many words in the context of the memorized text and recognize those same words in isolation (Blackwell-Bullock, 2008-2009). A child with a full concept of word can accurately distinguish between the words and white spaces on the page and use her knowledge of letters and sounds to help keep her place in the text and locate words when asked. This same child has come to understand what a word "is" and begins to quickly recognize words that she sees repeatedly - thus allowing her to build a bank of words she can read quickly, easily, and by sight.

Limitations

The present study was limited in at least two ways. First, the study used existing data from a large-scale literacy improvement project coordinated out of a research university in the Western United States, with approximately 4,600 kindergartners from 54 schools in eight counties in a Western state in the United States participating. It should be noted that the participating schools had high percentages of low-income students and English learners, thus educators and researchers should be cautious in generalizing this study's findings to different populations and geographic areas. However, the findings described above are consistent with the results obtained in similar studies with students from more affluent schools (see Flanigan, 2007; Uhry, 1999; Uhry, 2002). Second, as the data were already in existing form, the researcher was not involved in the gathering of said data. As a result, there is the possibility that some subtests from the PALS-K may have been administered incorrectly or scored incorrectly, and it is possible that the some of the data may have been entered into the database incorrectly. However, the literacy improvement project from which this data was collected provided extensive training in the administration and scoring of the PALS-K for each school's reading specialists. The reading specialists, in turn, trained the teachers in their own schools and supervised the assessment and data entry process. In addition to the training and supervision, the PALS-K materials themselves contained detailed instructional manuals and training videos to assist teachers in the assessment and scoring process. Overall, the PALS has inter-rater reliability coefficients that are consistently high, ranging from .96 to .99 suggesting that the PALS-K can indeed be scored and administered reliably (Invernizzi, et al., 2003). In addition, the reliability of the score entry into the Internet data entry system utilized by the PALS is regularly checked against a randomly selected sample of hand-scored assessment summary sheets. These reliability checks consistently reflect an overall entry accuracy rate of approximately 99% (Invernizzi, et al., 2003). Thus, this reliability in the assessment, scoring, and data entry process can be assumed for the data used in this study as well.

Implications for Teaching

The present study, like the few concept of word studies preceding it, support concept of word development as a pivotal event in early literacy acquisition. The present study also confirms the significant relationship between concept of word and other early literacy skills. In particular, the present study highlights the significant relationship between concept of word development and the development of spelling and ability to read words in isolation. Spelling scores were highly correlated with concept of word scores suggesting that as spelling ability improves, concept of word development is refined. Since one cannot "teach" concept of word to a child, as illustrated in the training study conducted by Mesmer & Lake (2010), it seems reasonable to assume that instruction in phoneme awareness and phoneme representation in spelling (two teachable skills) would benefit children with developing or rudimentary concepts of word. The ability to concretely represent (with letters) the abstract nature of phonemes (sounds) appears to play a large role in development of a child's concept of word. This makes sense considering that having a concept of word in text requires the child to be able to differentiate between the marks and white spaces on the page. A concept of word in text also requires a child to have at least a partial working knowledge of letter-sound correspondences to help interpret the signs/symbols presented.

An additional implication for teaching relates to the acquisition of sight words or the ability to read certain words automatically and quickly – in other words, by sight. A closer look at the approximately 1900 kindergartners who had actual scores entered on the preprimer word recognition in isolation subtest indicated that these students were spread across the three developmental gradations of concept of word in roughly comparable numbers: 681 were coded by the researcher as *developing* a concept of word, 601 as having a *rudimentary* concept of word, and 671 as having a *full/firm* concept of word. As shown in Figure 2, of the 681 with a developing concept of word, 572 correctly read five or fewer words and only 33 recognized ten or more. As shown in Figure 3, of the 601 children with a rudimentary concept of word, the range of words read correctly represents a more normal distribution. However, more than half of this group, or 344 students, could correctly read fewer than ten words and only 257 could correctly read 10 or more. As shown in Figure 4, of the 671 with a full/firm concept of word, only 35 correctly read five or fewer words and 590 recognized ten or more.

Figure 2
Preprimer Word Recognition in Isolation Stem-and-Leaf Plot for Concept of Word level= developing

```
Frequency    Stem &  Leaf

  257.00        0.   xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
  104.00        1.   xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
   76.00        2.   xxxxxxxxxxxxxxxxxxxxxxxxx
   47.00        3.   xxxxxxxxxxxxxxxx
   47.00        4.   xxxxxxxxxxxxxxxx
   41.00        5.   xxxxxxxxxxxxxx
   19.00        6.   xxxxxx
   19.00        7.   xxxxxx
   22.00        8.   xxxxxxx
   15.00        9.   xxxxx
   11.00       10.   xxxx
   23.00 Extremes    (>=11.0)

 Stem width:        1
 Each leaf:       3 case(s)
```

Figure 3
Preprimer Word Recognition in Isolation Stem-and-Leaf Plot for
Concept of Word level= rudimentary

```
Frequency    Stem &  Leaf

   16.00        0.   xxxxxxxxxxxxxxxx
   29.00        1.   xxxxxxxxxxxxxxxxxxxxxxxxxxxxx
   28.00        2.   xxxxxxxxxxxxxxxxxxxxxxxxxxxx
   26.00        3.   xxxxxxxxxxxxxxxxxxxxxxxxxx
   37.00        4.   xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
   44.00        5.   xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
   33.00        6.   xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
   43.00        7.   xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
   46.00        8.   xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
   42.00        9.   xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
   36.00       10.   xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
   39.00       11.   xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
   34.00       12.   xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
   32.00       13.   xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
   28.00       14.   xxxxxxxxxxxxxxxxxxxxxxxxxxxx
   26.00       15.   xxxxxxxxxxxxxxxxxxxxxxxxxx
   15.00       16.   xxxxxxxxxxxxxxx
   13.00       17.   xxxxxxxxxxxxx
   12.00       18.   xxxxxxxxxxxx
   10.00       19.   xxxxxxxxxx
   12.00       20.   xxxxxxxxxxxx

 Stem width:        1
 Each leaf:       1 case(s)
```

Figure 4
Preprimer Word Recognition in Isolation Stem-and-Leaf Plot for
Concept of Word level= full/firm

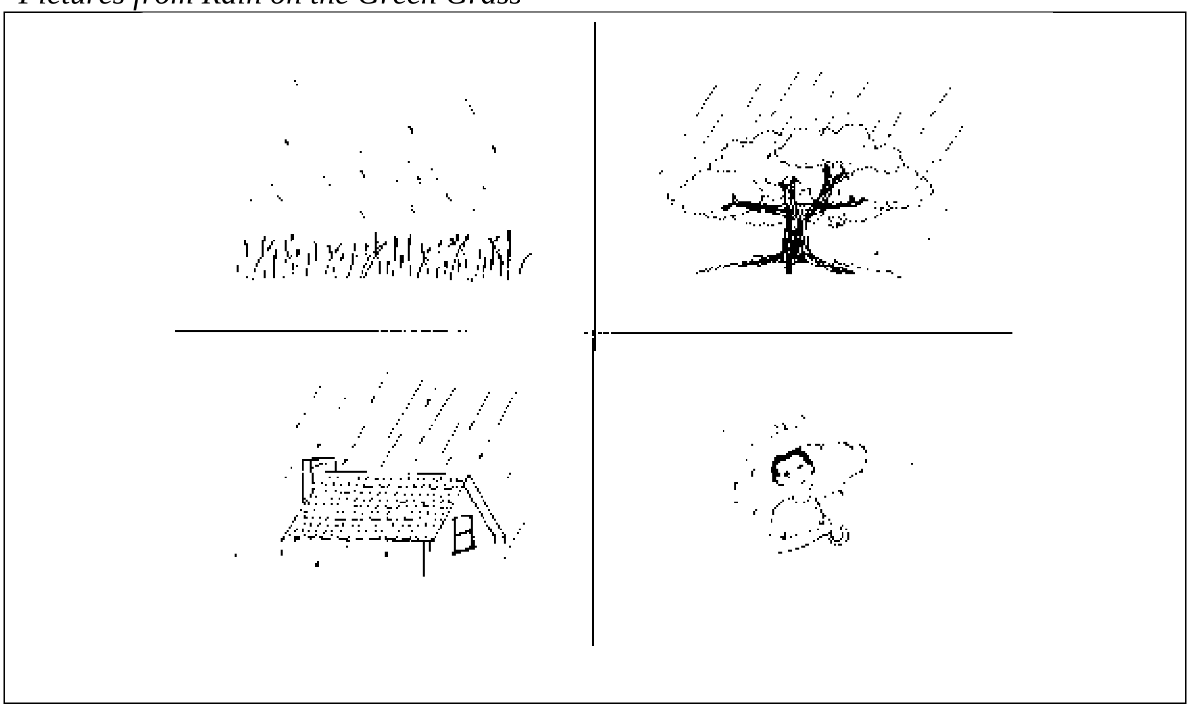
```
Frequency    Stem &  Leaf

   21.00 Extremes    (=<2.0)
    3.00        3.   x
    6.00        4.   xxx
    5.00        5.   xx
    6.00        6.   xxx
   11.00        7.   xxxxx
   14.00        8.   xxxxxxx
   15.00        9.   xxxxxxx
   15.00       10.   xxxxxxx
   25.00       11.   xxxxxxxxxxxx
   33.00       12.   xxxxxxxxxxxxxxxx
   38.00       13.   xxxxxxxxxxxxxxxxxxx
   41.00       14.   xxxxxxxxxxxxxxxxxxxx
   31.00       15.   xxxxxxxxxxxxxxx
   45.00       16.   xxxxxxxxxxxxxxxxxxxxxx
   42.00       17.   xxxxxxxxxxxxxxxxxxxxx
   70.00       18.   xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
   78.00       19.   xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
  172.00       20.   xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx00

 Stem width:        1
 Each leaf:       2 case(s)
```

As shown above, as concept of word development progresses, students are able to recognize more sight words. Most kindergarten curriculums and programs contain a sight word component and many districts specify the number of sight words a kindergartner should know by the end of the year. As a result, at least a portion of a kindergartners' instructional day is spent on the task of learning these sight words. The present study suggests that this may not be the best use of instructional time for all kindergartners – particularly for those students who are developing concepts of word and many of those students with rudimentary concepts of word. Intervention time or small group, scaffolded instruction for these students might be more productive if focused on helping the students crack the alphabetic code (e.g. learning letter names, letter sounds, how to represent speech sounds in writing) and allowing them to apply these skills as they attempt to fingerpoint read memorized texts.

A final teaching implication is the need to include ample opportunities for children to practice matching voice-to-print in memorized text, a teaching activity described below, so that teachers have the opportunity to monitor concept of word growth over time. Several studies have discussed ways to assess a child's concept of word (Downing & Oliver, 1973; Ehri & Sweet, 1991; Gately, 2004; Morris, 1981; Morris, 1993; Morris, et al., 2003a; Morris, et al., 2003b; Roberts, 1992; Roberts, 1996). Assessing a child's concept of word in text involves the child fingerpoint reading a memorized text. This can be accomplished in a number of ways. One method is to use a shared book experience (Morris, 1981). In a shared book experience, a teacher reads aloud an enlarged version of a piece of text, such as a big book version of a favorite trade book. Together, the children and teacher choral and echo read the text many times. Finally, individual children are given a chance to fingerpoint read various pages in the book while the teacher observes their ability to match their words to the text. Another method is to use a child's own dictated sentence or story (Morris, 1981; Morris, 1992). This technique is especially useful for the child who has a difficult time memorizing stories or poems. It is a unique way to assess concept of word because the child practices fingerpoint reading text that he generated himself. In this method, the child dictates a sentence or story to the teacher and she writes down exactly what the child says. Then, the teacher observes as the child fingerpoint reads the sentence that he just dictated for assessment. A third, more common method to assess a child's concept of word is to use a nursery rhyme, short story, or poem. Many types of these texts have been used in studies about concept of word. For example, Ehri and Sweet (1991) assessed concept of word using a modified version of O. A. Wadsworth's poem *Over in the Meadow* and the nursery rhyme *Peter, Peter Pumpkin Eater*. Morris (1981, 1993) described the use of the nursery rhyme *Humpty Dumpty* and a small book, *My Home*, from a commercially produced reading series for assessment. Recent studies (Morris, et al., 2003a; Morris, et al., 2003b) described the use of the rhyme *Sam, Sam the Baker Man*, and two tester-created sentences. While this method of using a nursery rhyme or poem seems to be the preferred way to assess concept of word, it should be noted that it is not necessary to use a commercially produced rhyme or poem. An analysis of the materials used in the studies suggests that almost any rhyme or poem can be used with the following guidelines: 1) The poem or text should have a natural rhythm or beat. 2) The poem or text should have pictures that accompany the text. 3) The poem or text should be easily memorized by the child. 4) The poem or text should be short (no more than four to six lines). 5) The poem or text should have one or two two-syllable words in it.

Once a text has been selected, the teacher can begin to assess the child's level of concept of word development. The method for assessing concept of word is similar throughout the literature (Ehri & Sweet, 1991; Gately, 2004; Morris, 1981; Morris, 1993; Morris, et al., 2003a; Morris, et al., 2003b) and is summarized below. The first step is to teach the text to the child. In most cases, the pictures (without any text) are placed in front of the child. Then, each picture is touched while the rhyme is said aloud. For example, the pictures below are from the rhyme *Rain on the Green Grass* from the PALS-K assessment (Invernizzi, et al., 2003).

Figure 5
Pictures from Rain on the Green Grass



As the first picture is touched, the teacher says, "Rain on the green grass." Followed by touching the second picture and saying, "Rain on the tree." Then the third picture saying, "Rain on the rooftop," and the fourth picture, "But not on me!" Following this introduction, the teacher and child echo read and choral read the pictures. (To echo read, the teacher says the words first and then has the child repeat the words. To choral read, the teacher and student say the words at the same time.) The child is then asked to recite the poem alone. If the child is unsuccessful at repeating the rhyme, the teacher provides the child additional time to practice until the child has committed the rhyme to memory. Once the child is successful, the teacher introduces the text by showing the child the pictures and the corresponding words from the rhyme. The teacher models how to fingerpoint read the text as she recites the poem that the child has memorized. The teacher directs the child's attention to the process and deliberately points to each word (while maintaining the natural rhythm of the text). Usually the teacher models reading of the entire text the first time through. Then, she returns to the first line of the text and the child is instructed to watch carefully as the teacher models how to fingerpoint read the first line. Next, the child is asked to fingerpoint read the text. At this point, the teacher may ask the child to identify a word in the text. For example, after reading "Rain on the green grass," the teacher may point to green and ask the child to identify the word; alternatively, the teacher may ask the child to find the word by asking the child to point to the word "green". The teacher and child continue this line by line reading through the end of the text. Now it is the child's turn to read the text alone, and the teacher asks the child to fingerpoint read the entire text. During the activities listed above, the teacher is considering the following questions as she attempts to determine the child's level of concept of word development: Does the child point to each word correctly as he reads across the line? If he makes a mistake in his pointing (mismatches his spoken word to the printed word), is he able to self-correct without teacher assistance, or is he unaware that he made a mistake? If the child comes to a two-syllable word, how does his pointing match to the word? After re-reading a specific line, can the child identify a target word? If so, is the identification immediate or does the child need to reread the entire line to identify the word? (This is called a running start.) Having read the entire rhyme, can the child identify individual words scattered throughout the text when the teacher points to them in random order or when the child is asked to find them? (What are his strategies for finding the words? – Does he immediately identify the target word or does he go back to the beginning of the line (or the beginning of the rhyme) and use contextual support to identify the word?

Implications for Future Research

As with so many other literacy concepts, more research is needed to fully understand the development of a concept of word in young children and the associations between this phenomenon and other early literacy skills. As Morris et al. aptly state (2003, p. 18):

> While literally hundreds of studies have examined the role phonemic awareness plays in reading acquisition, researchers have paid little attention to beginning readers' concept of word in text. This may be because researchers who study the beginning reading process have not had the opportunity to observe young children in real reading situations. Until one actually sees a child struggling to fingerpoint read a simple text -- struggling to match spoken words to printed words -- it is very easy to take this developmental skill for granted...."

In most studies, concept of word was viewed in terms of a mastery criterion. The present study is a first step at providing a more detailed examination of concept of word development by utilizing a novel approach to classifying concept of word scores. Most studies have simply viewed concept of word development as mastered or not mastered; in contrast, the present study classified concept of word scores as *developing*, *rudimentary*, or *full/firm*. Although results from the discriminant analyses discussed earlier indicated that early literacy measures, particularly word recognition in isolation scores and spelling scores, can indeed be used to predict whether a child developing, rudimentary, or firm concept of word, further research in this area would be beneficial. Of the approximately 4600 kindergartners who participated in the literacy research project, only 1997 had actual word recognition in isolation scores reported. Additional studies where word recognition in isolation scores, in addition to the other PALS-K subtest scores, were collected from each kindergartner would help to further explore the predictive power of word recognition in isolation scores for the developmental gradations in concept of word development. In addition to word recognition in isolation scores, future studies might consider alternative spelling assessments. For the PALS-K data used in this study, the children were asked to spell five consonant-vowel-consonant (CVC) vowel words. Each spelling attempt was scored for the number of phonemes represented and a bonus point was awarded for each correctly spelled word, with 20 points possible on the measure. In the data set used for this study, of the 4600 students who participated, more than 2,100 earned 15 or more points on this measure. This suggests a large ceiling effect for this subtest, thus potentially limiting its predictive power. Alternative developmental spelling assessments, such as the *Primary Spelling Inventory* (see Bear, et. al., 2012), or adding additional appropriate CVC word to the assessment could provide a more varied analysis of spelling development in these children and result in a wider range of scores to be used in the analyses.

Additional predictive analyses are another area for further examination. In the present study, discriminant analyses were used to determine the ability of measures of rhyme awareness, beginning sound awareness, alphabet knowledge, letter sounds, spelling, and word recognition in isolation to predict a child's level of concept of word development. The results from the discriminant analysis suggest that it is possible for individual subtests to predict a child's level of concept of word development; therefore, it would be interesting to conduct a series of one-way analysis of variances (one-way ANOVAs) to test this possibility.

Another area for continued research is to investigate the relationship between concept of word development and other early literacy skills with pre-kindergarten and post-kindergarten populations. As a developmental phenomenon, one would anticipate that the relationships and predictive power would remain true, but additional research in this area is necessary to confirm this hypothesis.

Finally, it would be beneficial to revisit the designated score ranges for each level of concept of word development. The present study found that, using discriminant analysis, close to 80% of students with a developing and full/firm concepts of word could be accurately predicted based on measures of preprimer word recognition in isolation, spelling, letter sound knowledge, alphabet knowledge and beginning sound awareness, while just over 50% of those with a rudimentary concept of word were correctly classified. This suggests that there may be a problem with the current score ranges used to classify concept of word subtest scores. Blackwell-Bullock, et al. (2008-2009) do not describe the process used to develop the score range for each level of concept of word development, but it is a fair assumption that the levels they reported were based on the authors' extensive work with emergent learners and the PALS-K assessment in general. A more objective or analytical evaluation of student performance on the concept of word subtest might yield more refined score ranges and result in increased classification accuracy.

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