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The influence of kindergarten and first-grade literacy instruction on the 3rd- and 5th-grade students' reading achievement : findings from the Early childhood longitudinal study, kindergarten class, 1998-1999

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THE INFLUENCE OF KINDERGARTEN AND FIRST-GRADE LITERACY INSTRUCTION ON THE 3RD- AND 5TH- GRADE STUDENTS' READING ACHIEVEMENT: FINDINGS FROM THE EARLY CHILDHOOD LONGITUDINAL STUDY - KINDERGARTEN CLASS, 1998-1999

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CHAPTER 1

STATEMENT OF THE PROBLEM

Many consider literacy to be the most important skill determining success in elementary students' academic performance (Hiebert & Raphael, 1996). The National Institute of Child Health and Human Development (NICHD) considers reading failure a national public health problem (Hearing on Measuring Success: Using Assessments and Accountability, 2001) because children's literacy skill not only affects their academic achievement but may also determine their future success in their careers and daily lives. Implementing the most effective scientific research-based reading program becomes crucial in facilitating children's reading development (Chhabra & McCardle, 2004).

Unfortunately, despite years of empirical study, researchers are still debating the most effective approaches to reading instruction. Beginning with Chall's (1983) book *Learning to Read: The Great Debate*, most of the discussion has revolved around two approaches to teaching reading: phonics instruction and whole language instruction. In the last 10 years, reading experts have begun to advocate for blended instructional approaches that combine features of phonics and whole language instruction.

Phonics instruction focuses on systematic, sequenced direct instruction (Chall, 1992) with an emphasis on decoding (Foorman, 1995). Phonics instruction separates literacy development into two stages: decoding the print and comprehending the meaning of the print (Xue & Meisel, 2004). Decoding the print requires understanding the letter-sound relationship and mastering phonics subskills such as phonemic awareness. Comprehension requires accurately recognizing words (Xue & Meisel, 2004). Research on phonics instruction suggests that a systematic approach is effective in helping children with their

word recognition and that letter recognition and decoding skills are strong predictors of reading achievement in later grades (Adam, 1994).

While phonics instruction emphasizes building the basic reading skills from the bottom up, whole language advocates have argued that reading skills should be developed from the top down (Xue & Meisel, 2004). Whole language instruction emphasizes using the meaning-making context to facilitate children's natural literacy development and deemphasizes direct teaching (Chall, 1992). Whole language advocates argue that reading skills should be developed through meaningful context rather than learning letter-sound relationships. Whole language instruction attempts to engage children in literature and motivate them to learn (Goodman, 1998; Robbins & Ehri, 1994; Xue & Meisels, 2004). Words are meaningless if they are taken out of context, and students should not learn to read from pieces of a whole context (Goodman, 1986).

Furthermore, whole language advocates suggest that early readers come with prior language knowledge, and based on this knowledge, readers are able to guess unknown words from context and are able to comprehend entire passages of text. The more children read, the more word recognition skills they develop. For whole language instruction to work, students are exposed to a literacy-rich environment with a wide range of materials such as picture books, novels, and other reading materials (Chall, 1983; Ehri et al., 2001; Goodman, 1986).

Both whole language and phonics instruction have their advantages and disadvantages, and therefore, some reading teachers have started to implement blended reading instruction approaches in their classrooms. According to a 2000 national survey of 1,207 elementary school teachers, 89% of teachers surveyed believed that direct instruction in phonics should be combined with language-rich activities (Baumann, Hoffman, Duffy-Hester, & Moon, 2000).

Both phonics (code-emphasis) and whole language (meaning-emphasis) approaches have been investigated extensively (Bergin & LaFave, 1998; Isbell, et al., 2004; Jalongo et al., 2004; Morris et al., 1995; Richgels, 1995; Stahl et al., 1993; Stahl & Miller, 1989; Turner, 1995; Van den Bosh, van Bon, & Schreuder, 1995; Xue & Meisel, 2004). There have also been at least three meta-analyses by advocates of both approaches (Ehri et al., 2001; Jaynes & Littell, 2000; Stahl & Miller, 1989) and several large handbook reviews (Chhabra & McCardle, 2004; Hiebert & Raphael, 1996; Pressley, 2006).

Despite reviewing research from different periods and from both whole language and phonics theorists, the three meta-analyses reported similar conclusions. Ehri et al. (2001) concluded that phonics instruction is more effective for reading achievement in later grades among various groups such as low socioeconomic status (SES) students and students with special needs and should be implemented in beginning reading instruction. Stahl and Miller (1989) concluded that both phonics and whole language instruction were equally effective. Whole language might be more effective if implemented in kindergarten rather than first grade but produces weaker effects on low SES and disadvantaged students. Furthermore, as students' academic needs change in later grades, the effects of whole language start to lessen. In Jeynes and Littel's (2000) meta-analysis, the authors concluded that whole language instruction was less beneficial for low-SES primary-grade children's standardized reading achievement tests than basal instruction. In addition, the results of this meta-analysis suggested that the reading gap between students with high SES and students with low SES would likely broadened if students in both groups received whole language instruction.

Even though these meta-analyses reported similar conclusions, researchers (Adams, 1994; Chall 1989) have noted a number of problems with the studies reviewed. Whole language researchers have based their arguments on philosophical issues and theories while phonics researchers have based their arguments on quantitative research. On the other hand, the quantitative studies have been heterogeneous, using a variety of approaches to teach phonics subskills, different outcome measures, and subjects from different grade levels ranging from kindergarten to third grade. Chall (1989) and Adams (1994; 1998) have argued that to determine whether one instructional approach is better than another, a large-scale scientific cooperative experiment that incorporates beginning reading instructional variables, students' characteristics, and appropriate statistical controls must be used.

In response to Chall's (1989) and Adam's (1994) critique of reading research, several recent studies have used data from the Early Childhood Longitudinal Study, Kindergarten Class 1998-1999 (ECLS-K) (NCES, 2000) to examine the effectiveness of phonics and whole language approaches to reading. The ECLS-K is a national probability sample of 21,260 kindergarten students with student, teacher, principal, and parents survey data collected during kindergarten, first-, third-, and fifth-grade. Although the ECLS-K is a large-scale survey and not a field experiment, the ECLS-K possesses many of the desirable features identified by Chall and Adams. Xue and Meisel (2004), for example, found that kindergarten students who received systematic phonics instruction performed better than those who received whole language instruction. Chatterji (2006) found that children's first-grade reading achievement was correlated with students' poverty level, school level, class size, and elementary teacher certification rate. And Kaplan and Walpole (2007) found that students' ability to

identify the sound of initial letter of words and the students' alphabet knowledge were strong predictors for their reading success in later grades.

Although these studies used the ECLS-K dataset to investigate the effectiveness of reading instruction on the same group of children over time, and were well done, they are not without problems of their own, problems this dissertation attempts to address. In particular, this study focused on three issues raised by the Xue and Meisel (2004) study.

First, Xue and Meisel used Rasch scaling methods, exploratory factor analysis, and literature to derive phonics and whole language measures of reading instruction from the ECLS-K Kindergarten Teacher Questionnaire. Some of the items Xue and Meisel used from the questionnaire may have been questionable. For example, according to their method, "reading aloud fluently" was categorized as a phonics approach, and "reading aloud" was categorized as a whole language approach. Furthermore, the two instructional measures, phonics and whole language instruction, correlated .55, suggesting that the two scales were not independent. Finally, if many teachers were using blended approaches to teach reading, then it would be desirable to also include such a measure if possible. Consequently, the first purpose of this study was to examine the items in the teachers' questionnaire and to see if a better procedure for defining types of reading instruction could be developed and then used to examine the influence of types of reading instruction on reading achievement.

Second, Xue and Meisel examined types of reading instruction in kindergarten only. While kindergarten instruction is important, most formal reading instruction begins in first grade and it is likely that first-grade reading instruction will have a larger effect on students' reading scores. Furthermore, Stahl and Miller (1989) concluded that whole language instruction was more

effective for kindergarten students' reading achievement, but phonics instruction was more effective for first-grade students' reading achievement, a hypothesis Xue and Meisels could not examine. Consequently, the second purpose of this study was to include measures of reading instruction from both kindergarten and first grade and to examine the influence of particular combinations of kindergarten and first grade instruction on reading achievement in first, third, and fifth grade.

Third, because the longitudinal data from the third- and fifth-grades had yet to be collected at the time of the Xue and Meisel (2004) study, they used only the kindergarten cross-sectional data. All the data for the ECLS-K have now been collected, including reading scores for first, third, and fifth grades. In addition, recent advances in longitudinal growth modeling make using student growth more feasible and more desirable as an outcome measure (Singer & Willet, 2003). Consequently, the third purpose of the study was to investigate the longitudinal effects of kindergarten and first-grade reading instruction on students' reading achievement growth over time, from kindergarten to fifth grade.

Purpose of the Study

The general purpose of this study was to examine whether phonics or whole language instructional approaches are related to reading achievement scores by conducting a secondary data analysis using the ECLS-K dataset. Specifically, the purpose was three-fold. First, the study attempted to revise Xue and Meisel's (2005) methodology in defining reading instruction by using an alternative methodology to define types of reading instruction. Second, the study examined the influence of different types of kindergarten and first-grade reading instruction on students' reading achievement in kindergarten, first, third, and fifth grade. Third, the study used students' growth in reading achievement from first to

fifth grade as the outcome measure to compare the effectiveness of different types of reading instruction. Children's background characteristics, thought to be important to reading achievement, were also examined.

The framework underlying this study comes from the general school and teacher effects literatures (Miller & Rowan, 2006; Raudenbush, 2004) that uses longitudinal designs (Singer & Willet, 2003) and hierarchical linear modeling (Raudenbush & Bryk, 2002) to identify effective instructional practices. Researchers have been asking, "How do we measure change over time?" since the seminal book edited by Harris (1963) and the influential paper by Cronbach and Furby (1970) outlined a host of conceptual and methodological problems with change scores. With the help of Rogosa (e.g., Rogosa, Brandt, & Zimowski, 1982; Rogosa & Willett, 1983), Raudenbush (Bryk & Raudenbush, 1987), and others, many of the earlier problems have been solved. There are now well developed models for measuring change, including repeated measures analysis of variance, hierarchical linear modeling, covariance structure analysis, and event history analysis. Recently, Singer and Willett (2003) collected many of these longitudinal models and presented their use in a consistent framework.

Longitudinal research is defined as studies that observe the same subjects over periods of time and examine their changes over time (Singer & Willett, 2003). Longitudinal design enables researchers to address two different types of questions: "*(1) How does the outcome change over time? (2) Can we predict differences in these changes?*"(Singer & Willet, 2003, pp. 7–8). Longitudinal designs enable researchers to characterize subjects' response patterns over weeks, months, and years. In addition, it enables researchers to examine the influence of person and environmental variables covariates on the patterns.

This study used hierarchical linear growth models (Raudenbush & Bryk, 2002) to examine children's reading achievement growth over time. This modeling were developed in stages, with initial baseline models describing students' initial status and growth rates giving way to more complicated models including students' background variables and reading instructional experiences in kindergarten and first grade.

Significance of the Study

This study is important for three reasons. First, reading researchers have suggested that the crucial stages for literacy acquisition occur during the first five years of children's lives (Mason & Allen, 1986; McGee & Lomax, 1990). If children do not develop basic reading skills in the early grades, children may suffer in all subjects in later grades. This study was not to advocate for a particular approach to reading instruction but to identify the most effective instructional approach to facilitate children's reading development and to examine the long term effects of that instruction.

Second, children's literacy development is a continuous process (Chall, 1983; Ehri, 1995; Kaplan & Walpole, 2005). The No Child Left Behind legislation (2004) urged teachers and policy makers to close the reading gap between students with different backgrounds. Policy makers and teachers have tried to implement best reading materials and practices for teaching children to read. There is no sound evidence to support the conclusions that phonics instruction in kindergarten is the most effective approach for beginning literacy or whole language instruction in kindergarten is most effective. This study used kindergarten and first-grade teachers' questionnaires to derive different types of reading approaches for early literacy and to investigate what type of reading instruction, if any, facilitate children's literacy development in the long run.

Therefore, this study provided evidence for early literacy teachers and policymakers making decisions about reading instruction.

Third, defining how to best measure reading approaches in the ECLS will help future researchers using the ECLS dataset to investigate the effects of reading instruction. This study attempted to define the reading instruction that was implemented in both kindergarten and first-grade classrooms.

Theoretical Rationale

Chall (1993) and Ehri's (1995, 1999) stages of literacy development provided the theoretical rationale for this study. Chall (1983) proposed six stages of literacy development: pre-reading, initial reading and decoding, confirmation and fluency, reading for learning new information, multiple view points, and construction and reconstruction. The first four stages (Stage 0, Stage 1, Stage 2, and Stage 3) covered the literacy development process for students until Grade 8. Ehri (1995, 1999) refined Chall's (1983) model by proposing sight word reading as a cognitive process of seeing a word and relating information about the word in the readers' memory. That information includes pronunciation, spelling, and meaning (Ehri, 1995). The four phases were characterized by the involvement of the alphabetic system: pre-alphabetic, partial-alphabetic phoneme awareness, full-alphabetic decoding, and consolidated alphabetic-automatic word recognition phases. Chall and Ehri argued that without mastery of the previous stage, readers experience difficulty in the following stage.

In Stage 0 (preschool to kindergarten), the pre-reading stage (Chall, 1983) or the prealphabetic phase (Ehri, 1995), readers have no knowledge about how the visual form of a word relates to the sound of a word. Children develop their oral language skills through listening to those whom the children are close to, such as caretakers and family members. The preschool environment becomes a

major factor of how well children develop their oral language skills, word recognition skills, and word knowledge, all of which are required for comprehension in later grades. Children remember the visual cue of the printed word without understanding the meaning or building the connection between words and sound. For example, children read the golden arches behind the "McDonald's" sign rather than the actual sound of the words or children do not notice the difference between "MILK" and "MICKY." It is not because they cannot identify the words, but because they do not have any letter-sound information stored in their memories (Ehri, 1995).

In Stage 1 (Grades 1–2), the initial reading and decoding stage (Chall, 1983) or partial-alphabetic (Ehri, 1995), children build sound-print knowledge of words, and recognize the initial and end letters of the words. At this stage, readers develop skills of identifying and connecting the salient letters (beginning and end letters) of a word and the sound of those letters. Ehri (1995) called this process phonetic cue reading. For example, children identify the first sound of "milk" as /m/ and the end sound as /k/. Through identifying the salient sound of the word, children are able to distinguish "milk" and "micky." Ehri (1995) argued that to master this stage, readers should fully develop their skills of identifying initial and end sounds of a word and build this information into their memory.

Moreover, Ehri (1995) argued that children remember how to read words if they are trained to be phonetic cue readers rather than trained as visual cues readers, because phonetic cues provide more systematic support for readers to build schema in their memories than visual cues. Words with irregular patterns are challenging for students who were trained only on segmented phonemic sounds. Ehri and Wilce (1987) found that partial phase readers who were trained as full-phase readers performed better in identifying vocabularies than readers

who were trained to read only isolated letter-sounds. Ehri (1995) has suggested that although partial-phase readers are still building the letter-sound schema in their memories, they should also be trained to read sight words that contains systematic and irregular spelling patterns.

In Stage 2 (Grades 2–3), the confirmation or the full alphabetic phase, children make connections between the spelling of the words and the meaning of the words in their memories. Children's ability to automatically access the letter-sound relationship determines whether readers can automatically link the spelling and the memory of the words in the children's memories. Thus, reading becomes easier for children who have mastered Stage 1 skills. Recreational reading and functional reading material increase during this stage.

Stage 3 (Grade 4–8) is the "reading for learning new knowledge" stage, or consolidated alphabetic phase. Readers use the patterns they develop through rhyme, syllables, or morphemes to increase their word knowledge. Reading activities become a tool for children to obtain new knowledge. Comprehension skill and children's prior knowledge play important roles in this stage.

Table 1.1 summarized the characteristics of each reading stage and how students acquire these skills. In addition, Table 1.1 includes a brief description of the content measured by the ECLS-K reading achievement IRT scores used in the study. To interpret the results of the longitudinal growth models, it will be important to know what is being measured by the reading scores at the end of each grade level.

In kindergarten (Stage 0), ECLS reading IRT scores measured students' ability to identify upper-and lower-case letters by name (letter recognition), and to associate letters with sounds at the beginning and the end of words. In first grade (Stage 1), ECLS reading IRT scores measured students' ability to recognize

common sight words in addition to recognizing beginning and ending sounds. In third grade (Stage 2), ECLS reading IRT scores measured students' comprehension and literal inference ability. In the fifth grade (Stage 3), ECLS reading IRT scores measured students' ability to identify clues used to make inferences and to use background knowledge combined with cues in a sentence to understand use of homonyms. In addition, the fifth grade scores also measured students' ability to extrapolate and evaluate by demonstrating understanding of the author's craft (how does the author let you know), by making connections between a problem in the narrative and similar life problems, by critically evaluating, comparing and contrasting text meaning, and by understanding the effect of features of expository and biographical texts. The characteristics of the literacy development stages correspond closely to the skills measured in ECLS-K.

Background and Need

The history of reading instruction in the United States has been like a pendulum swinging between phonics instruction and whole language instruction. Since the 1930s and 1940s, beginning reading programs have focused on comprehension. In the 1960s and 1970s, the language experience approach argued that children should learn to read the same way as they learn to speak, and that the most efficient way to develop children's literacy skills was to expose them to a literacy-rich environment. In the 1980s, whole language emerged out of the language experience approach, and proponents argued that reading was an extension of oral language development and it was unnecessary for children to learn alphabetic codes (Foorman, 1995).

Table 1.1
Summary of Kindergarten to Fifth Grade Children's Literacy Development and ECLS Kindergarten to Fifth Grade Reading Ability Measurement

Stage Age & Grade Range	Major Characteristics & Skills by End of Stage	How Acquired	ECLS K to fifth grade reading measurement
Stage 0: Prereading, Grade Range: Preschool to kindergarten	➢ Child "pretends" to read, retells story when looking at pages of book previously read to him/her; ➢ Names letters of alphabet; ➢ Recognizes some signs; ➢ Prints own name; ➢ Plays with books, pencils, and paper	➢ Being read to by an adult (or older child) who responds to and warmly appreciates the child's interest in books and reading; being provided with books, paper, pencils, blocks, and letters.	➢ Letter recognition ➢ Beginning and ending sounds:
Stage 1: Initial Reading Grade Range: 1 – 2	➢ Child learns relation between letters and sounds and between printed and spoken words; ➢ Child is able to read simple text containing high frequency words and phonically regular words; ➢ Uses skills and insight to "sound out" new one syllable words	➢ Direct instruction in letter-sound relations (phonics) and practice in their use ➢ Reading of simple stories using words with phonic elements taught and words of high frequency ➢ Being read to on a level above what child can read independently to develop more advanced language patterns, knowledge of new words, and ideas.	➢ Beginning and ending sounds ➢ Sight words
Stage 2:Confirmation & Fluency Grade Range: 2-3	➢ Child reads simple, familiar stories and selections with increasing fluency. ➢ Consolidating the basic decoding elements, sight vocabulary, and meaning context in the reading of familiar stories.	➢ Direct instruction in advanced decoding skills; wide reading of familiar, interesting materials which help promote fluent reading. ➢ Being read to at levels above their own independent reading level to develop language, vocabulary, and concepts.	➢ Comprehension of words in context Literal inference: making inferences using cues that are directly stated with key words in text
Stage 3: Reading for Learning the new Grade Range: 4 – 8	➢ Reading is used: ✓ Learn new ideas, ✓ Gain new knowledge, ✓ Experience new feelings, ✓ Learn new attitudes; ➢ Generally form one view point.	➢ Reading and study of textbooks, reference works, trade books, newspapers, and magazines that contain new ideas and values, unfamiliar vocabulary and syntax ➢ Systematic study of words and reacting to the text through discussion, answering questions, writing, etc.	➢ Extrapolation ➢ Evaluating

Whole Language

The whole language approach emphasizes the holistic nature of reading that is authentic and meaningful. While reading, children figure out the meaning of the words from the text and pictures from their vocabulary knowledge before they can pronounce the words correctly. Children discover and learn their required phonological skills such as letter-sound relationship and blending through meaningful and authentic literacy activities and a print-rich environment. No direct instruction is necessary for this kind of development (Goodman, 1986; Gunderson & Shapiro, 1988).

Whole language approaches require the following components: (a) words to be used in a natural whole text, (b) words that are meaningful and functional for children, (c) instructions that are student-centered and student-directed, and (d) words used that capture the students' interest (Goodman, 1989; Morrow, 1990; Weaver, 1994).

Readers make sense of the context through their own schema that are constructed through their knowledge, experiences, and feelings in their daily lives (Weaver, 1994). Stanovich and West (1989) argued that automaticity of word identification depends on reading experiences. The more literature children read, the better automaticity they build. Students who come from lower socioeconomic status families, however, do not always have the luxury of being exposed to a language-rich environment and the same life experiences as required by the whole language approach because of economic or home language constraints. Therefore, these students are at a disadvantage in comparison to students at middle or higher SES students (Stanovich & West, 1989).

Whole language instruction studies have defined whole language instruction with different characteristics. Jeynes and Littel (2000) synthesized

Watson's (1989), Bergeron's (1990), and Stahl and Miller's (1989) definitions of whole language instruction, and proposed several common characteristics: (a) using whole works of literature and functional language, (b) using student-centered instruction and assignments, and (c) emphasizing language experiences.

The whole language and phonics approaches, however, are not isolated from each other. Even though whole language instruction seems to be very different from phonics instruction, Stahl and Miller (1989) argued that the whole language and phonics approaches share several similarities. First, both approaches emphasize the importance of children's language production as a bridge between oral and written language. Second, both approaches use children's literature. The whole language approach, however, emphasizes the originality of written language, which allows children to predict and identify words from their context. Third, both approaches emphasize the meaning of words in the context in which they are written, as opposed to teaching words in isolation. The difference between these two approaches is their use of teaching materials. The whole language approach uses trade books, experience charts, predictable patterns in context, and invented spelling and writing, and emphasizes words' functionality. Phonics uses basal readers, workbooks, controlled vocabularies, and emphasizes words' relationship with its sound.

Phonics

While the whole language approach argues that readers rely more on semantic-context cues to read words, the phonic approach proposes that readers rely more on letter-level cues. Semantic-context cues, however, are relatively important according to phonic researchers (Pressley, 2006). Children's literacy development consists of two different parts — decode the print and comprehend

the text, a finding supported by Curtis's (1980) who argued that word recognition skill is related to second-graders and fifth-graders' reading comprehension skills. Roberts and Mering (2006) concurred with Curtis (1980) argument and suggested that systematic instruction is essential to facilitate students to development of their letter-level decoding skills. Students with learning disabilities or low SES students particularly benefit from phonics instruction.

Within Chall's first stage of literacy development, researchers have identified at least five levels of phonemic awareness (Pressley, 2006). First, the primitive level involves children's ability to recognize the sound of the words and can be accessed through children's nursery rhyme knowledge. The second level is measured by the oddity task that requires children to identify the similarities and differences among a group of words through sounds. The third level is children's ability to blend words and split syllables. The fourth level is phonemic segmentation tasks. Students' analytical skills and ability to delete and tap phonemic sounds are assessed during this stage. The fifth level is students' proficiency in phonemic manipulation tasks (Adams, 1989). The last three skills - blending and splitting, segmentation, and manipulation - were found to be the most predictive variables of children's later reading achievement (Chall, Roswell, & Blumenthal, 1963; Liberman et al., 1974, 1977; McNeil & Stone, 1965; Share et al., 1984; Tunmer & Nesdale, 1985).

Decoding skills, including phonemic awareness and phonics, are essential in reading acquisition. Students' phonemic awareness ability is a strong predictor for kindergarten and first-grade students' reading performance (Ball & Blachman, 1991, Bradley & Bryant 1983). Chall (1996) concluded that decoding instruction was more effective than meaning-making instruction for students who have special-learning needs. Stahl (2001) argued that in the initial stage of reading-

skill development, the purpose of reading instruction should support the development of students' ability to read a future texts rather than focus on providing students with authentic reading experiences.

Phonics and Whole Language Effectiveness

The effectiveness of each approach has been the focus of considerable research and discussion (Chall, 1996; Chaterjii, 2006; Ehri et al., 2001; Goodman, 1986; Gunderson & Shapiro, 1988; Van den Bosch et al., 1990, Wagner et al., 1995). Phonics researchers have argued that the reading gap can be closed with phonics instruction (Chall, 1996; Chaterjii, 2006; Ehri et al., 2001; Van den Bosch et al., 1990; Wagner et al. 1995). Studies that compared reading programs were all in favor of phonics instruction (Foorman et al, 1998; Jones et al. 1997; MaRae, 2002; Maddahian, 2002; Skindrud & Gersten, 2006; Slavin & Madden, 2001; Venezky, 1998). While phonics research provided quantitative supports for their arguments, whole language theorists have argued that words should be learned within context. Whole language theorists oppose systematic phonics instruction by arguing that students develop the phonics skills that are needed for reading naturally when they are exposed to a print-rich environment (Goodman, 1986; Gunderson & Shapiro, 1988). Research has shown that using literature in children's reading curriculum not only provides a meaning-making purpose but also increases children's use of comprehension strategies, motivates children to read and understand the text structure, and develops children's vocabulary knowledge (Morrow, 1992; Robbins & Ehri, 1994).

A major study of phonics and whole language effectiveness in kindergarten was done by Xue and Meisel (2004). They used the ECLS-K data file to examine the influence of early literacy instruction on 13,609 kindergarten children in 2,690 classrooms and 788 schools. Xue and Meisel's measurement of

reading instruction was derived from the Kindergarten Teacher Questionnaire. The reading achievement outcome measure was students' IRT reading scores. Even though the results suggested that whole language instruction is more effective for kindergarten students, the researchers suggested that further investigation of the impact of early reading instruction on students in the long run should be investigated when the data became available.

Xue and Meisel's (2004) results hinged on their definition of phonics and whole language instruction. Their measurement for reading instruction used 26 reading activity items from the Kindergarten Teacher Questionnaire that included reading activities both approaches use. The items included questions such as "How often do children work on 'reading aloud' activities?" and "How often was 'reading aloud fluently' skill taught in your classroom?" These items were organized into two scales purportedly measuring phonics and whole language instruction. Despite attempting to measure two different types of reading instruction, the two scales correlated .55, leading one to question the results of their measurement procedure for types of reading instruction

An additional problem with the Xue and Meisel (2004) study is that they examined reading instruction in kindergarten only. But formal reading instruction usually begins at first grade and therefore, it is important to include first-grade reading instruction before conclusions can be draw about the effectiveness of different types of reading instruction. Stahl and Miller (1989), for example, argued that even though whole language instruction might be more effective for kindergarten students' initial reading experience, reading comprehension, which requires strong word recognition skills, plays a more important role in later grades. Phonics instruction, however, is better at developing childrens' word recognition skills (Pressley, 2006). Therefore, in this study, students' growth in

reading achievement will be examined from kindergarten to fifth grade, and first-grade reading instruction will be included as an independent variable.

According to Chall (1983), it may be that phonics and whole language approaches are effective at different stages of literacy development, a possibility explored in the study. She suggested that the whole language approach may be more effective in developing children's concept of print, which is essential for kindergarteners' reading development. Several correlational studies (Clark, 1988; Ferroli & Shanahan, 1987; Morris & Perney, 1984; Richgels & Barnhart, 1992) have found that children who were trained with inventive spelling skills in a whole language approach performed better than traditional spellers in various word learning and reading programs. On the other hand, evidence suggests that direct instruction of sound-symbol correspondence advances children's decoding skill in later grades (Downing, 1979). Furthermore, systematic instruction that includes phonemic awareness, phonics, fluency, vocabulary, and comprehension was effective in teaching children to read. Skilled readers not only possess decoding skills, but are also fluent readers with strong word recognition skills (National Reading Panel, 2001). According to automaticity theory in reading (LaBerge & Samuels, 1974), before students understand the meaning of the words in the context, they need to first decode the words and recognize the words. The faster the readers decode the words, the more cognitive processing space in readers' working memory is freed for comprehension (Pressley, 2006). Even though the main purpose of this study is not to directly address this issue, the result of the study may provide evidence related to this question.

Research Questions

Following Xue and Meisel's (2006) study, the overall purpose of the study was to examine the effectiveness of phonics and whole language reading

instruction. However, three important design improvements to their study were made, resulting in two research questions:

1. What type of instruction is provided to kindergarten and first grade students based on the ECLS-K Kindergarten and First-Grade Teacher Questionnaire?
2. What is the relationship between types of reading instruction and reading achievement and growth at kindergarten, first, third, and fifth grade? Does the type of reading achievement students received in kindergarten and first grade influence reading achievement in third and fifth grade?

Definition of Terms

Authentic literacy: Literature that helps readers to make sense of the world and has meanings to readers.

Basal reading instruction: Reading instruction that emphasized blending letter-sound correspondences and using decodable texts.

Blended reading instruction: Reading instruction that combined both phonics and whole language instructional approach in the classroom.

Children's home language: In this study children's home language variables refer to the language children speak at home. The subsample of interest in this study includes Asian languages, Hispanic, European languages, English, and other.

Decode-emphasis reading instruction: The instruction that emphasizes sounding out words using letter-sound relation. (Pressley, 2006, p.146)

Graphemes: Units of print (Neuman & Dickinson, 2002, p.16)

Inventive spellings: Children's ability to attend to sound units in words and associate letters with those units in a systematic though nonconventional way before being taught to spell or read (Richgels, 1985, pp. 1-2).

Minority status: In this study minority group will include the following subgroups: Caucasian, Asian, Hispanic, African American, and other. The "SES status" variable will use the continuous measure of SES in the ECLS database.

Phoneme: Units of sound (Neuman & Dickinson, 2002, p. 16)

Phonemic Awareness: Children's ability to identify the elements of spoken word (National Reading Panel, 2000). Children's "*conscious attention to phonemes."* (Neuman & Dickinson, 2002, p.144)

Phonetic cues reader: Readers that identify a word by identified the phoneme sound of partial components of a word. For example, readers identify the word "elephant" by being able to pronounce the word 'garden' by identifying the letter-sound relationship of "GDN".

Phonics Instruction: Instruction that focuses on developing students' decoding skill and their ability to relate print to sound, and reading material consist large amount of controlled vocabularies.

Phonology: Every aspect that has to deal with the sound of language (Neuman & Dickinson, 2002, p.144).

Sight word: Words that readers can recognized quickly and automatically without going through decoding or phonological recoding. The words that readers have already accurately read for several times and the meaning and the sound of the words are already stored in readers' memory.

Sight word reading processing: The process of seeing a word and reading words by accessing information of the word in readers' memory (Ehri, 1992).

Systematic phonics instruction: Direct reading instruction that stresses the letter-sound correspondences acquisition and their use to read and spell words (Harris & Hodges, 1995; National Reading Panel, 2001, p. 2-89).

Visual cues reader: Readers that can identify a word by unique visual form of a

word but the visual form does not have particular phonemic connection to the words. For example, readers identify “BDN” for garden and “LFT” for elephant.

Whole language instruction: Student-centered reading instruction that trains students’ schema of print and reading comprehension skill through meaningful activities and literatures.

CHAPTER 2

REVIEW OF THE LITERATURE

This chapter reviews some of the literature on the effectiveness of different types of beginning reading instruction. There are three sections in this chapter. The first section reviews several recent longitudinal studies on students' reading development. The second section presents three meta-analyses of reading instruction. The final section summarizes this literature. Due to the large body of reading research that investigated different elements of reading development, this literature review selected only research articles that are frequently cited works published in peer-reviewed journals, and works that provide theoretical underpinning for the current study.

Longitudinal Studies on Reading Instruction

Reading researchers have argued that longitudinal studies lasting more than one or two years and that have large sample sizes are very important in determining the predictors of elementary school reading achievement (Adams, 1990; Bulter et al., 1985; Chall, 1989). This section mainly reviews longitudinal studies that used the Early Childhood Longitudinal Study, Kindergarten Class 1998-1999 (ECLS-K) data files to investigate variables that affect students' reading development in the primary grades. Two additional longitudinal studies that investigated influences of phonics instruction on students' reading comprehension achievement scores in later grades are also reviewed. Students' background variables and the reading achievement measures of the current study reflect the variables discussed in the following literatures. Furthermore, reading instruction measures that are discussed in the following reviews serve as the foundation of defining the reading construct of the study. The methodology

for analyzing the effects of reading instruction on students achievement for the current study derive from the following longitudinal studies as well.

Xue and Meisel's (2004) longitudinal study used ECLS-K data to investigate the effects of reading instruction on kindergarten students. Three different types of reading instruction were examined in this study: phonics instruction, whole language instruction and blended instruction. The sample for the study used students in the first two waves of data, fall kindergarten and spring kindergarten. The independent variables were features of school organization, classroom characteristics, characteristics of students, and teachers' instructional methods derived from School Administrator Questionnaire. The dependent variables were students' direct reading achievement test results, indirect teachers' rating of students' achievement according to the Academic Rating Scale (ARS), and teachers' rating of students' approaches to learning according to the Social Skills Rating Scale (SRS).

Xue and Meisel defined types of reading instruction by using Rasch scaling methods based on exploratory factor analyses and the reading instruction literature. The researchers then categorized students according to the reading instruction they received in kindergarten. In addition to the phonics and whole language instruction groups, they also identified a particular group of teachers that incorporated both whole language and phonics instruction in their classroom as a secondary part of the study groups.

To investigate the instructional effects the authors estimated several hierarchical linear models (HLM). Three modeling steps were used. Step 1 partitioned the variability in outcomes into three levels using an unconditional HLM model: between students within classrooms, between classrooms within schools, and between schools. Step 2 constructed a within-classroom model

(Level 1) to estimate the relationships between students' social and academic backgrounds and their outcomes at the end of kindergarten. Step 3 then constructed a between-classroom model (Level 2) to evaluate instructional effects on the intercept and slope from the Level 1 model.

The results of partitioning variance among the three levels of analysis suggested that classrooms and schools explained major portions of variance in student outcomes. The student-level model indicated that students' initial, fall kindergarten status on reading, ARS, and SRS were related to their corresponding scores at the end of kindergarten. The classroom-level model indicated that both phonics and whole language instructional measures had positive effects on direct reading achievement tests.

The students that received whole language instruction had scored higher ARS score at the end of kindergarten. Furthermore, the results suggested that the more time teachers spend on reading instruction, the higher the students' reading achievement. Students from affluent families scored higher in reading than poor students, Asian students scored higher than Caucasian students, and both groups performed better than African American and Hispanic students, and students from other ethnic groups. There was no significant difference for different ethnicity groups in teachers' rating of ARS and SRS. Whole language instruction had a stronger effect on students' ARS than phonics instruction. Students' approaches to learning were rated higher when their teachers used whole language instruction more often.

In terms of students' cognitive achievement results, all three types of reading instruction- phonics, whole language, and blended - had significant effect on achievement. Whole language instruction was more effective than phonics instruction on students' end of kindergarten reading achievement scores. The

blended instruction, however, had the strongest positive effect on students' reading achievement at the end of kindergarten. Students that were in the blended group had higher reading achievement scores regardless of students' family characteristics, entering level, and initial ability.

As mentioned in Chapter 1, the results of Xue and Meisel's study hinged on how reading instruction was defined. Their procedure resulted in a .55 correlation between their whole language and phonics instruction scales, suggesting that new procedures should be examined. The current study intends to define reading instruction using both kindergarten and first grade reading activity items from the Kindergarten and First grade Teacher Questionnaires.

Chatterji's (2006) investigated the reading achievement gap among students using the ECLS K-1 data set. The author used a two-level HLM to investigate the effect of class size, teachers' certification, and parents' involvement on students' first-grade reading achievement. The author also investigated the practice-policy factors at the school level, as well as whether reading gaps were narrowed through instruction and school policies in kindergarten and first grade.

Students' fall kindergarten reading achievement, their pre-school experiences, and their background (gender, ethnicity, and family's SES status) were used as student-level variables. Reading achievement measures taken prior to kindergarten were the predictors for spring first-grade reading achievement. School-level variables included composite context variables (mean poverty level, mean prior reading levels at a school), school variables (class size, school size, teacher certification), school practice-policy factors (reading instruction times, student attendance, incidence of individualized educational plans), and parent involvement variables. Students' home language was a controlled variable in the model. NCES recommended weight, C124PW0, was

applied to account for the complex sampling and to maintain the original sample size.

Key findings of this study suggested that students with different SES status, gender, and ethnicity showed a different pattern of reading achievement in first grade. In addition, even though the author did not investigate the effects of different types of reading instruction on students' reading achievement, the author suggested that different types of reading instruction might close the early reading gap in third and fifth grades and suggested further investigation. The effect of students' SES status, however, diminished as students progressed to later grades. This finding did not agree with other studies. This discrepancy might be due to the author's not including types of reading instruction in her study.

Students from African American families and high-poverty families appeared to have lower reading achievement in first grade due to lack of prior reading readiness and home literacy environment. This finding suggested that pre-school experiences and home literacy environment are strong predictors for reading achievement in later grades. Furthermore, the author concluded that the more instruction time teachers spend with students, the greater the increase in students' reading achievement. This finding was consistent with Xue and Meisel's (2004) study. Chatterji found students benefit from smaller class size as they receive more individual attention from teachers, finding consistent with the Tennessee STAR investigation (Finn & Achilles, 1999) and other small class research. Chatterji's study also suggested that individual instruction could close the gap between students with less reading readiness and those who were from a rich home literacy environment, but less prepared students received phonics instruction or whole language instruction was not investigated.

While the findings of Chatterji's study suggest that kindergarten reading achievement was not a strong predictor of students' reading achievement in later grades, the author noted that different types of reading instruction might close the early reading gap in the third and fifth grades and suggested further investigation.

Chatterji suggested that further investigation using full set of ECLS-K data to investigate the effect of different types of reading on third- and fifth-grade students are necessary. Therefore, the current study continues Chatterji's study to investigate whether different types of reading instruction types would close the reading gaps between students from different ethnicities and SES groups.

Kaplan and Walpole (2005) examined Ehri's (1995) reading development stage theory. In addition to examining the reading stage theory, they also investigated students' transitions from one stage to the next and possible indicators that contribute to early reading success. These indicators included students' socioeconomic status, students' access to a rich literacy environment both in and outside school, and cognitive abilities (letter name and letter-sound knowledge, phonemic awareness, vocabulary knowledge, and other oral language measures).

The authors used latent transitional analysis to investigate students' response patterns to the five subtests over four data points (fall kindergarten, spring kindergarten, fall first grade, and spring first grade). From low to high reading ability, students were grouped into five latent classes according to their reading scores: low alphabet knowledge (LAK), early phonemic awareness (EPP), advanced phonics awareness (APP), early word reading (EWR), and early reading comprehension (ERC).

Reading achievement in the study was measured by students' scores in letter recognition, knowledge of beginning sounds and end sounds, sight words,

and words in context comprehension. As expected the authors found that as students progressed to higher grades, the membership proportion of the lower latent classes decreased and the membership proportion of the higher classes increased. Furthermore, students' alphabet knowledge and ability to segment initial sounds in preschool were strong predictors for reading success in later grades. This finding was consistent Ehri's (1995) reading development stage argument that students' knowledge about the print allows students to make connection between the visual form of the word, its sound, and the meaning of the word in their memory. The authors argued that reading instruction must facilitate students in developing their letter- sound knowledge in the earlier grades so students are better prepare for the next automaticity stage.

The authors also included students that were both above and below the poverty line in the study. The results indicated that the movement of the poverty level membership proportion was similar to the model that included all students. Students below the poverty line were more likely to be in the lower skill latent group. Those students that were above the poverty line appeared to progress to more advanced classes at an increased rate compared to those below the poverty line. In addition, the authors argued that possession of advanced reading skills during preschool appeared to offset the effect of poverty on students' literacy development. This result is consistent with Juel's (1988) argument that students who leave kindergarten without strong phonological awareness and decoding skills tend to have difficulties in reading in later grades.

Kaplan and Walpole (2005) did not investigate the effect of reading instruction on improving kindergarten students' phonological awareness. As mentioned by Kaplan and Walpole's study, additional reading instruction, either

phonics or whole language approach, should be included in investigations of the progress of students' reading development.

Wagner, Torgesen, and Rashotte (1994) investigated the relationship between kindergarten, first-grade, and second-grade students' phonological processing abilities and their acquisition of reading proficiency for alphabetic language. The authors investigated the causal relationship between various phonological processing skills and students' reading proficiency in their early reading acquisition stages (from kindergarten to second grade). Wagner et al. (1994) hypothesized that there were bi-directional influences between phonological processing skills and students' reading achievement performance.

The sample included 288 students randomly selected from kindergarten classrooms in six elementary schools in Tallahassee, Florida. The students were followed from kindergarten to second grade. Forty-four students were lost during the study period of three years, making the final sample size 244 students. Twenty-two phonological processing items were used to assess students' reading achievement progress. Items that created floor or ceiling effects were dropped to facilitate the validity of the measurement model before analyses. In terms of analyzing students' within-subject factors (phonological processing ability and grade), the authors used repeated measures analysis of variance. The analysis indicated that students' phonological abilities developed differently in different grades.

Correlation among these phonological processing items indicated that the phonological processing abilities shared common variance. These processing abilities synthesize with each other rather than serving as single, reliable cause for students' reading achievement. In investigating the effect of decoding on phonological processing abilities, the authors found a causal relationship

between the ability of kindergarteners to name letters and phonological processing abilities in later grades.

The results of the study suggested that the rate of young students' phonological processing development might vary across students. The study indicated that the relationship between phonological processing abilities and the acquisition of reading ability are bi-directional. Additionally, the results indicated no straightforward effect of phonological processing skills on students' ability to name letters. The results supported both phonics instruction and whole language theories. According to the phonics approach, students' decoding ability supports their reading achievement (Chall 1967). Conversely, the whole language approach argues that students' develop their decoding skills through their own reading experiences (Ehri, 1983). The finding of the study provided support for a middle ground blended approach that combines the advantages of phonics and whole language instruction.

Roberts and Meiring (2006) also investigated the influence of teaching phonics through controlled-vocabulary literature (literature content) and teaching phonics in the context of spelling (spelling content) on fifth-graders' reading, spelling, and writing achievement. At total of 60 first-grade students were followed to the fifth grade, and their reading achievement was assessed at three time points. Even though the same was ethnically mixed, nonparametric tests showed ethnicity and English-language-learner status did not differ between treatments.

The study measured spelling and reading tasks, reading of phonetically regular pseudowords, high frequency sight words, reading words in context of familiar and unfamiliar stories, reading decontexualized words, writing tasks, and comprehension tests. Students were randomly assigned to either spelling-context or the literature-context group. Classrooms were designed to be print-rich environment with plenty of meaning literature activities with systematic phonics

instruction. Teachers taught each group for 4 weeks and then switched to other groups to keep the quality and time of instruction for each student comparable. Instruction focused on developing essential skill sets for decoding: (a) individual grapheme segmentation, (b) grapheme to phoneme conversion, and (c) blending phonemes. Students in the spelling group used the "*Spelling Through Phonics* program. Picture books selected from *Recommended Literature: Kindergarten through Grade Twelve,* were used to teach letter-sound correspondences and blending skills. Students wrote daily journals in response to the literature they read and were encouraged to use invented spelling in their writing.

A two-stage hierarchical linear model of change was used to analyze the performance of the literature-context group and the spelling-context group across three time points. Systematically teaching phonics through spelling context was more effective than teaching phonics through literature, and was particularly effective with at-risk students. Students' fifth-grade reading comprehension scores were higher if they have been taught to spell in first grade. It was also found that if students entered first grade with higher alphabet knowledge the effect of the spelling-context instruction appeared to be stronger. This study was not only consistent with Chall's (1983) reading development stage theory that students need to master reading skills in earlier grades for later reading success but also consistent with the automaticity argument (Logan, 1997) that reading comprehension is facilitated by student's word recognition skills.

Skindrud and Gersten's (2006) longitudinal study with second and third-grade students compared the effectiveness of two reading programs, Success For All and Open Court. The objectives of the study were to compare students' reading and language achievement growth on a standardized group achievement test, to investigate whether different approaches created different achievement outcomes in lowest-quartile students in the whole school, and to investigate the

effect of different approaches on special education enrollment rates school-wide.

Successful for All is a comprehensive reading program that attempts to prevent early reading difficulties by using a systematic skill based instructional approach. The Open Court Program, on the other hand, emphasizes a whole-class instructional structure. Areas such as decoding comprehension, inquiry, investigation, writing, spelling, vocabulary, grammar, usage, mechanics, penmanship, listening, and speaking are systematically introduced as students progress (SRA/McGraw Hill, 1996, 2000).

Students with similar prior reading achievement scores in the two demographically matched schools were selected for the study. Data on two different cohorts were collected over two years: (a) an academic outcome cohort that included students started reading programs at second and third grade (Cohort 1, N = 936) and (b) a special education enrollment cohort that included students from kindergarten to sixth grade (Cohort 2).

The instrumentation for the academic outcome cohort included Reading and Language subtests of the Stanford Achievement Test, 9th edition (SAT9) from spring 1998 and 1999. The subtests of the SAT9 were to measure the reading transfer effect (from reading mechanics, usage, content, and organization) on SAT9 (Harcourt Brace, 1996). The teachers' survey was used to categorize teacher's characteristics in teaching experiences, certification status, and formal education as well as to determine the teacher-to-pupil ratio.

The 2x2 ANCOVA on SAT9 reading scores indicated a significant effect favoring Open Court and a significant interaction for Cohort 2. Open Court students outperform SFA students in SAT9 reading achievement tests. The 2x2 ANCOVA analysis on SAT9 language scores demonstrated a significant effect between programs in Cohort 1 where Open Court students outperformed SFA

students. For Cohort 2, there was a significant interaction between program and grade level.

The 2x2 ANCOVA analysis on total reading for the bottom-quartile Cohort 1 showed the Open Court program has a strong effect (*d*=.73 and .67) on low SES students. The effect of the Open Court program on low SES students in Cohort 2 is medium (*d*=.31 and .43). Students on the Open Court program outperformed those who were in the SFA program in their SAT9 reading scores. The results also suggested that the low SES students benefited more from the Open Court program. This result is contrary to the authors' prediction that the bottom-quartile students that received the SFA reading program would have stronger performance growth compared to the whole school. The findings support the interpretation that the students' success in reading depends on the quality of curriculum tools their teachers use.

Additional findings of the study suggested that the SFA program accommodated at-risk students better than Open Court because (a) Open Court lessons progress faster than SFA lessons, and (b) SFA groups students homogeneously. In contrast, 80% of the time Open Court programs are taught to whole-class, heterogeneous groups. The SFA program offered more time for small-group instruction and individual reading tasks than Open Court, (c) the SFA adds motivational strategies such as class celebrations, cheers, team competitions, and other incentives. These strategies provide supports for at-risk students. The authors, however, raised the following research question: do these strategies provide temporary or long-term accommodation for at-risk students?

Skindrud and Gersten's (2006) concluded that instructional quality was more critical than instructional quantity. The SFA had less control over curriculum content and lesson pacing than the Open Court program. By analyzing the

difference between the lesson-pacing plans for both programs, the authors concluded that the differences in the outcomes for the two programs result from the difference in the quality of curriculum content and the quality of implementation. Quality of instruction was directly related to student growth in reading achievement. This study also showed that intervention starting in second or third grade is too late for at-risk students. Thus, the authors concluded that early reading intervention starting in kindergarten may reduce inappropriate special education referrals.

The finding of the study favoring the Open Court program was consistent with Maddahian's (2002) study that compared the SFA and the Open Court programs in Los Angeles City Schools. Maddahian's study also reported that students in the Open Court program significantly outperformed the students in the SFA program. The lower-quartile students at similar poverty levels in Maddahian's study also showed stronger reading skills if they received Open Court programs in second grade.

In summary, the longitudinal studies reviewed here all support phonics instruction and provide evidence to support the argument that students' reading skills need to be developed systematically. Even though whole language instruction may motivate students to read in the earlier grade (Xue and Meisels, 2004) there are few empirical studies on the effect of whole language instructional approaches in later grades. The next section reviews meta-analysis studies that incorporate several qualitative whole language studies to provide a more balanced review of both phonics and whole language instructional approaches.

Meta-analysis Studies

Even though longitudinal studies provide empirical evidence to address the question of the influence of reading instruction on students' achievement, several of these studies only examined a particular type of instruction and did not compare the influence of phonics and whole language instruction on early reading achievement. This section reviews several meta-analysis studies that compared phonics and whole language instruction and that provide a quantitative evaluation of the effectiveness of the two approaches on students' reading achievement.

Stahl and Miller's (1989) meta-analysis study investigated two databases: five projects from the United States Office of Education's (USOE) first-grade studies and 46 additional studies that compared the effects of both whole language and basal reading approaches on students' reading achievement. The purpose of the study was to provide a quantitative review of studies evaluating the effectiveness of the whole language approach to students' reading achievement.

The whole language and basal reading approaches share several similarities. First, both approaches emphasize the importance of students' language production as a bridge between oral and written language. Second, both approaches use children's literature. The whole language approach, however, emphasizes the originality of written language, which allows students to predict and identify words from the context in which they are presented. The basal reading approach adopts the original written language for decoding training purposes. Third, both approaches emphasize the meaning of words in the context in which they were written as opposed to teaching words in isolation. The whole language approach differs from the basal reading approach in the use of

trade books, experience charts, predictable patterns in context, and invented spelling writing. Whole language emphasizes the functionality of words. Goodman and Goodman (1979) argued that students learn to read in the same way they learn to speak.

Stahl and Miller (1989) used Downing's (1979) reading development models to identify the effectiveness of different instructional approaches for students' reading achievement. Downing (1979) suggested that students' reading development goes through three stages: (a) a *cognitive* stage where students become aware of the necessary tasks that are involved in reading; (b) a *mastering* stage where students keep practicing the required skill sets for becoming skilled readers until they master those skills; and (c) an *automaticity* stage where students practice the reading skill sets until they can perform those skills without conscious attention. In addition, Stahl and Miller (1989) used the first three stages of Chall's (1983) reading development model that concerns mastery of required reading skills and automaticity to evaluate effects of reading instruction on students in early grades. These stages are pre-reading, initial reading and decoding, and confirmation and fluency.

To select studies for meta-analysis, the authors first defined whole language instruction. They employed Slaughter's (1988) argument that the difference between whole language and phonics instructional approach is the amount of time teachers spend in their reading activities in class. Teachers that used whole language instructional approaches appeared to spend less time in direct instruction comparing to teachers that used the phonics instructional approach. The authors selected studies that only applied the whole language approach and avoided studies that investigated populations that included disadvantaged students.

Forty-six studies were selected from the ERIC and Dissertation Abstracts databases in addition to the USOE first grade studies. These studies yielded 50 effect sizes from non-USOE studies and 71 effect sizes from USOE first grade studies, for a total of 121 effect sizes. The small mean of the total effect sizes (μ=.009, sd =.61), with range from -1.46 to 1.91, suggested that there was no difference between the effects of whole language and phonics instruction on students' reading achievement scores. Types of reading instruction in kindergarten and first grade, phonics and whole language, had more significant effect on students' word recognition scores rather than on their comprehension scores in later grades.

The results of vote-counting, effect size, chi-square test, and one-sample t-test suggested that the whole language approach was more effective in kindergarten but that both approaches were equally effective in first grade. For low SES students, the only significant result suggested that the whole language approach was not as effective as the basal reading approach for low SES students. In comparing the effect of reading instruction on students' comprehension achievement, the whole language approach was less effective on students' comprehension achievements than phonics approach. Phonics instruction approach was more effective in developing students' word recognition skills.

Whole language advocates argue that students learn decoding through reading large amounts of literature and that literacy exposure time is strongly correlated with reading achievement. Stahl and Miller (1989) argued that whole language is effective for students who have access to reading resources but less so for low SES students with limited resources. Therefore, direct reading instruction shortens their literacy exposure time and direct instruction of sound-

symbol correspondence advances students' decoding skills in the automaticity stage.

Jeynes and Littell (2000) meta-analysis extends Stahl and Miller's (1991) study by including additional studies that examined the effectiveness of whole language instruction on students' reading achievement. Jeynes and Littell (2000) pointed out that no commonly agreed upon definition of whole language instruction existed. Thus, the authors synthesized Watson's (1989), Bergeron's (1990), and Stahl and Miller's (1989) definitions for whole language instruction and proposed several common characteristics: (a) whole pieces of literature and functional language, (b) student-centered instruction and assignment, and (c) emphasis on language experiences.

In responding to whole language advocates' argument that standardized tests ignored students' creativity and attitude towards reading, Jeynes and Littell (2000) used the reading achievement measures that were used in whole language studies. They synthesized 14 studies that investigated the effect of whole language and phonics instruction on low SES kindergarten and third grade students. Four questions were asked in the study: (1) How does whole language compare to basal treatment in general? (2) Can whole language programs be subdivided into groups with different degrees of definitional purity? (3) How do the subgroups compare to basal treatments and to each other? (4) Are quality, duration, or year of study related to effect size in any way? (5) Are effect sizes related to types of outcome measures, especially standardized versus nonstandardized tests?

The instrument included 24 non-standardized and attitudinal reading achievement measures that were unique to each study. Interrater reliability (.85) was used to estimate the quality of the selected studies. Hedges's (1981) "g"

measure of effect size was used to estimate the effect sizes. In evaluating the studies, the authors found that whole language studies appeared to use more non-standardized tests and phonics studies appeared to use more standardized test as reading achievement measurement. The authors then argued that standardized tests should have more weight because of the higher reliability and validity in measuring student reading achievements.

The overall effect size was -.65 indicating that whole language instruction was less beneficial for low-SES primary-grade students' standardized reading achievement tests than basal instruction. In addition, Jeynes and Littlle arugued that the reading gap between students with high and low SES students would likely increase if students in both groups received whole language instruction. The authors argued that teachers have unrealistic assumptions about students in low-SES classes that might cause the failure of whole language instruction. Whole language instruction required students to be exposed to a large amount of literature and possess some knowledge about written language before entering school. Low-SES students do not have this privilege because of their limited home and school resources.

In the meta-analysis conducted by Ehri et al. (2001) for the National Reading Panel, the effects of phonics and whole language instruction on students' spelling, reading comprehension, and reading achievement were compared. In addition, the authors investigated whether phonics instruction is more effective for kindergarteners and first-graders than students in later grades. The authors' rationale was based on Chall's (1989) argument about the stages of reading development. Chall (1989) argued that print concept, letter name, and phonological awareness are fundamental to success in the formal reading

instruction stage. These skills should be taught in a systematic way before students' formal reading instruction.

The goal of phonics instruction is to assist students in acquiring knowledge of the alphabet and to use the skill to read and spell words. To the contrary, the whole language approach teaches students to read whole words. Students in a whole language environment acquired 50 to 100 words in their sight vocabulary before formal reading instruction. In formal reading instruction, whole language teachers teach phonics as the need arises.

Thirty-four experimental and quasi-experimental reading studies published after 1970 were identified from peer-reviewed journals. The criteria for selecting the studies were as follows: (a) the studies had to be conducted in English-speaking countries, (b) they had to be long-term studies that investigated reading as an outcome measurement, (c) effect size had to be able to be calculated from the statistic results of the study, (d) they should examine phonics instruction, (e) the results of the study could not duplicate other studies, and (f) the control groups had to have received whole language or non systematic phonics instruction.

Once identified, the studies were then coded according to several categories: types of phonics program, type of control group, sample size, grade level, reading ability, socio-economic status, instructional delivery units, group assignment procedure, and pre-treatment group differences. Students who participated in the study were categorized into one of four categories: normal-achieving readers, at-risk readers, students with reading disabilities, and low-achieving students. Reading outcome assessment was categorized into six types: decoding regular words, decoding pseudowords; reading irregularly spelled word lists, spelling, comprehension text, and reading text aloud.

Effect sizes were used to compare the reading outcomes of both the systematic phonics instruction and non-systematic phonics instruction. A overall effect size of .41 indicated that systematic phonics instruction was more effective for reading outcome than non-systematic phonic instruction. Two test points were used to calculate the effect sizes: at the end of the instruction or at the end of the school year. If the instruction would last longer than a semester, test point will be calculated at the end of the instruction, and follow up four to 12 months after the instruction ended.

The overall finding was that phonics instruction had a greater effect on reading achievement than whole language (or non-systematic) instruction (d = .41). Phonics instruction started in kindergarten had stronger effect on students' reading achievement scores (d=.55) han the same instruction started in first grade (d=.27). The effect of phonics reading instruction lasts through later grades. In terms of assisting students to read and spell, phonics instruction had a greater effect on students' reading, spelling, text process outcomes and regardless of the class size.

The meta-analysese supported Chall's (1967) theory that phonics instruction has a greater impact if students receive it during their early education. Furthermore, phonics instruction not only improved kindergarteners' reading achievement but also their first grade reading achievement and also improved the achievement of older students who are reading disabled. Some studies (Lovett et al., 1997; Santa & Hoien, 1999; Stuart, 1999; Torgesen et al., 1999) have suggested that the effect of systematic phonics instruction can last until sixth grade, but the long-term effect did not appear for low-achieving students. This finding contradicts Stahl and Miller's (1989) meta-analysis and Xue and Miesel's (2004) longitudinal study.

Ehri's (2001) meta-analysis supported Chall's (1967) and Stahl and Miller's (1989) argument that phonics instruction helps beginning readers comprehend text and benefits reading comprehension in later grades. In addition, phonic instruction improves reading comprehension for students with reading disabilities, students in low-SES classes, and English as second language (ELL) kindergarteners.

Ehri et al. (2001) also compared seven systematic phonic approaches: Jolly Phonics (Lloyd, 1993), the Lindamood ADD program (Lindamood & Lindamood, 1984), Lippincott Basi Reading (1981), Open Court Reading (1995), Orton Gillingham (Gillingham & Stillman, 1979), Direct Instruction/Reading Mastery/DISTAR (Engelmann, 1980), and Sing Spell Read & Write (Dickson, 1972). The effect size showed that nonsystematic phonics instruction is less effective than systematic phonics instruction but that there was no difference among the systematic phonics instruction approaches.

The control groups in these studies received various whole language approaches: basal, regular curriculum, whole language, whole word, and miscellaneous. The authors included studies that investigated the effectiveness of whole language instruction and calculated the effect sizes of these studies. The effect sizes suggested that phonics instruction was still more effective for students' reading than whole language instruction, regardless of the type of program students received.

Ehri et al. (2001) also suggested that the later students received systematic phonic instruction, the less effective the instruction. This effect might be caused by students have already adopted different reading skills before the systematic instruction. It might take longer for them to adapt to the systematic instruction.

Turning to reading comprehension, the results suggested that systematic phonic instruction improved the reading comprehension of students with reading disabilities. Systematic instruction, however, did not improve older students' spelling skills, but it did have greater effect on first graders.

Stahl and Millier (1989) suggested that whole language was more effective for motivating students to read and whole language instruction has stronger effect on kindergarten students' reading achievement scores than first grade students' scores. Students build a solid conceptual foundation of reading through learning to read meaningful text. Chall (1967) argued that basic knowledge of the relationship between words and sound and basic decoding skills are essential for reading development. The finding of Ehri et al (2001) study suggested a different result from Stahl and Miller's (1989) meta-analysis, but supported Chall's (1967) theory. In order to find more support for either of Stahl and Miller (1989) and Jeynes and Littlell's (2000) studies, further research on systematic phonics instruction for students in later grades is suggested.

Even though different research studies defined whole language instruction in various ways, inventive spelling is typically one defining characteristic of whole language instruction. Richgel's (1995) study illustrated how inventive spelling is used in classrooms and provided evidence as to its effectiveness.

Inventive spelling is an approach that allows students to experiment with the meaning of and explore the connection between written and spoken language, with no instruction. Burns and Richgels (1995) defined inventive spelling as "students' ability to attend to sound units in words and associate letters with those units in a systematic though nonconventional way before being taught to spell or read" (pp. 1–2).

Long-term classroom-based studies have shown a strong correlation between good spelling skills and reading achievement and Ehri and Wilce (1987) found that direct-instruction-trained inventive spellers explaind the strong correlation. Good inventive spellers use their newly acquired phonemic knowledge with their existing knowledge before their phonemic training when they encounter new words.

Richgels' (1995) causal-comparative study asked whether good inventive spellers were better word learners than poor inventive spellers, if neither group had received instruction in phonemic awareness or spelling. Richgel (1995) also extended Ehri and Wilce's (1987) study that investigated performance differences between natural inventive spellers who had not reached their discovery stages, well-developed spellers, and those who were trained as inventive spellers. A second purpose of Richgel's (1995) study was to determine whether good inventive spellers performed differently from the poor ones when presented with more complex and difficult words. The third purpose was to determine whether more sophisticated spelling skills relate to better reading skills.

Richgels based his argument for this particular study on Ehri and Wilce's (1987) hypothesis:

> "if beginners can spell inventively, then they ought to be able to use their letter knowledge to recognize and remember relations between boundary letters in spelling and sounds in pronunciations and in this way commence learning to read words (Ehri & Wilce, 1985, p. 165). If pre-readers can spell inventively, they should also be able to use letter names to detect phonetic cues in learning to read words by sight (Scott & Ehri, 1990, p.153).

The participants were students from two schools in a northwest suburb of Chicago and three kindergarten classes from a school in a nearby rural community that was in the same school district as the other two schools. This school district endorsed the whole language approach in literacy development. The participants were predominately white and middle class.

The sample size was 119 (66 boys and 53 girls) students who were randomly chosen from the 162 consenting participants. Three screening phases – alphabet identification, word identification, and invented spelling - were applied to identify good and poor inventive spellers. Sixteen good inventive spellers and 16 poor inventive spellers were identified in the second phase of the study. Subjects were alphabet knowledgeable but non-word readers. The instruments of the study included (a) the Boehm Test of Basic Concepts (Form C); (b) Ball and Blachman's (1991) Phoneme awareness test; and (c) three screening tasks.

The first screening task was to ask subjects to identify the 26 uppercase letters on the cards. The second screening task was a set of words that included seven words from the Woodcock-Johnson (1978) first-grade word list, 12 phonetically simplified words, three numerals (5, 6, and 10), and two words displayed in classroom calendar routines. These words were used to test students' word identification skills. The third task was *Inventive Spellings* developed by Richgels (1986a, 1986b) and Burns and Richgels (1989). This task required students to spell out the words they thought would represent the 10 picture cards (noise, feet, table, pie, bird, nest, bridge, sock, drum, and wagon) using plastic, magnetic, uppercase alphabet sets. The total possible points were 35 on the 35 essential phonemes in the 10 words. Students were given points when they correctly placed the phonemes of the 10 words.

Long-term, classroom-based studies had shown a strong correlation between good spelling skills and strong reading performance. Ehri and Wilce's studies with the direct-instruction-trained inventive spellers explains the strong correlation. Good inventive spellers utilize their newly acquired phonemic knowledge with their existing knowledge prior to their phonemic training when they encounter new words. This study only investigated the "natural" inventive spellers' performance. The result is consistent with Ehri and Wilce's explanation of the strong correlation between spelling skill and reading performance.

This study also focused on investigating the relationship between spelling ability and trainability to read phonetically simplified words in the real classroom environment. Inventive spellers in this study came from schools that were categorized as "whole language kindergarten". Every classroom instruction was "incidental". Students in these classes had never received any letter-sound or phonemic awareness training. Good inventive spellers tended to possess stronger phonemic awareness and spelling abilities. In addition, good spellers tended to read new phonetically simplified printed words better than poor spellers. In terms of word difficulty, there was only slight difference in terms of reading short-word lists and the result was insignificant. In terms of instructional issues, the author suggested that more direct instruction was needed in case of the low-income, inner-city population because students here had a less preferable environment and formal instruction to nurture inventive spellers.

Richgels (1995) concluded that good inventive spellers were better word learners and more sophisticated spellers than the other two groups. Inventive spellers tended to use their newly acquired knowledge of phonetic cues in words. In addition, Richgels (1995) argued that the words' difficulty did not interact with

students invented spelling skills. Good inventive spellers outperformed poor spellers in both difficult and easy word sets.

Summary

The research reviewed in this chapter suggests that the earlier in time students receive reading instruction, the better students' reading achievement will be in later grade. In addition, lower-SES students or students with learning disabilities benefit from phonics instruction more than whole language instruction. Phonics instruction also improves students' spelling and word recognition skills. Whole language instruction, however, appears to motivate students to read.

Reading studies from both phonics and whole language approaches provided sound evidence for their own arguments. Phonics instruction studies appeared to provide more quantitative results to support their arguments while whole language studies focused on a more philosophical orientation. Phonics studies focused on segments of students' reading skills while whole language studies focused more on students' attitude towards reading.

The primary phonics theory concerning reading development is based on Chall reading development stages and Ehri's modification of Chall's theory. According to the theory, each stage builds upon skills that were developed in previous stages. Reading development follows the stages of phonemic awareness, phonics, fluency, vocabulary, and comprehension (National Reading Panel, 2001). To the contrary, Goodman (1986) argued that students' reading development evolves through the holistic and meaning-making qualities of reading literature.

Researchers on each side have argued about which type of reading instruction is the most effective for developing students reading ability. Stahl and Miller (1989) argued that whole language instruction is beneficial for

kindergarteners, but systematic phonics instruction might be more effective for first-grade students. Reading comprehension in later grades requires strong word recognition skills that build upon well-developed decoding skills. Students in later grades (i.e., fourth grade or fifth grade) might perform better if they receive phonics instruction in first grade.

The conclusion of the meta-analysis conducted by Ehri et al. (2001) led to more research on the effectiveness of reading instruction for students with different backgrounds. The researchers concluded that systematic phonics instruction not only improves kindergarteners' reading achievement but also improves the reading achievement progress of first-grade and older students who have reading disabilities. The effect of systematic phonics instruction in first grade can last until sixth grade.

From a cognitive processing viewpoint, reading comprehension requires various cognitive processing activities. Students' abilities to automatically decode the words reduces students' cognitive load and frees up more space for comprehending the text. Systematic phonics instruction in kindergarten and earlier elementary grades, therefore, benefits students' reading comprehension skills in later grades (Pressley, 1997; Roberts & Meiring, 2006; Snow, 1998; Stahl & Miller, 1989).

Chall (1983) argued that the earlier systematic phonics instruction is introduced, the better reading skills students acquire because once students are comfortable with a certain method of reading text, they need to put more effort to switch to the other method of reading. Goodman (1989) has suggested that students develop better reading skills if they are exposed to a print-rich environment. Due to limited resources, students in low-SES and non-English-speaking home environments are at a disadvantage. Therefore, research on the

effectiveness of different types of reading instruction on students from low-SES home environments has been viewed as helpful to addressing this debate.

The current study incorporates the student background variables included in the previous longitudinal studies (Chartterji, 2006; Kaplan & Walpole, 2005; Roberts & Meiring, 2006;and Xue & Meisel, 2004) and reading achievement outcomes presented in the meta-analysis (Ehri et al., 2001; Jeynes & Littell, 2000; and Stahl & Miller, 1989) to investigate the effect of reading instructions on students' reading achievement in later grades. In addition, the current study also incorporates reading instruction activities that were presented in previous research to provide a more complete picture of the influence of reading instruction on students' reading achievement growth. Details for generating the variables are presented in Chapter 3.

CHAPTER 3

METHODOLOGY

This chapter presents the methodology used in the study, divided into four sections. The first section describes the overall research design, general variables of the study, and the statistical analysis modeling underpinning this study. The second section includes descriptions of the procedures used by the National Center for Education Statistics (NCES) to produce the Early Childhood Longitudinal Study, Kindergarten Class of 1998-1999 data file (ECLS-K), and various data files created for public use. The third section describes the creation of the data set used for this study and the fourth section contains the specific variables used in the study. The independent and dependent variables are presented and the treatment of missing data for each variable is embedded in the discussion.

Research Design

Overview of the Study

This secondary analysis study used the ECLS-K to examine the influence of different types of reading instruction in kindergarten and first grade on students' reading performance in kindergarten, first, third, and fifth grade as well as their reading growth from kindergarten to fifth grade. Factor and cluster analyses were used to identify phonics, blended, and whole language instruction at both grade levels, for a total of nine patterns of reading instruction for kindergarten and first grade. Two level longitudinal hierarchical linear models (HLM) were then estimated to investigate the reading achievement and growth trajectories of children's reading performance from kindergarten to fifth grade and to relate the different types of kindergarten and first grade reading instruction to

that growth. Quadratic growth models were used and several background and control variables were included as well.

Data analyses were done in two stages. First, the instruction variables were identified from factor and cluster analyses of the ECLS-K Kindergarten and First Grade Teacher Questionnaire. Questionnaire items were factor analyzed separately for each grade and factor scores were clustered to identify groups of teachers with particular patterns of teaching emphasis across the factor scores. Substantive interpretations that identified three teaching patterns at both kindergarten and at first grade were discussed.

Second, students' item response theory (IRT) scores from kindergarten, first, third, and fifth grades were used to develop a quadratic achievement growth model that was then examined for the influence of kindergarten and first-grade reading instruction on the reading achievement of students. Student background, control, and dummy variables representing type of reading instruction were entered into a two level longitudinal HLM analysis at four time points: spring kindergarten, spring first grade, spring third grade, and spring fifth grade.

Table 3.1 presents the five groups of variables: achievement, time, student background, student control, and reading instruction variables. Level 1 variables were the time and reading achievement variables collected in fall kindergarten, spring kindergarten, spring first grade, spring third grade, and spring fifth grade. The assessment for kindergarten and first grade students achievement contained questions assessing students' familiarity of conventions of prints and decoding skill. Three skills were (a) indicating that reading goes from left to right; (b) going to the beginning of the next line after a line ends; and (c) finding the end of the story. Third and fifth reading assessment contained items that measures students' reading comprehension skills (ECLS K-5 Manual, 2004).

Level 2 variables were children's background variables, student control variables such as fall kindergarten general knowledge IRT scores (conceptualized here as ability), and instruction variables defining kindergarten and first grade reading instruction. Child background variables included gender, race, home language, socioeconomic status (SES), and ability.

Table 3.1

List of Variables

Achievement Variables
Fall kindergarten reading IRT score
Spring kindergarten reading IRT score
Spring first grade reading IRT score
Spring third grade reading IRT score
Spring fifth grade reading IRT score
Time Variables
Time 1: Fall kindergarten
Time 2: Spring kindergarten
Time 3: Spring first grade
Time 4: Spring third grade
Time 5: Spring fifth grade
Background Variables
Gender
Race
Home Language
Control Variables
SES
Ability
Instruction Variables
KP1P (kindergarten phonics, first grade phonics)
KP1W (kindergarten phonics, first grade whole language)
KP1B (kindergarten phonics, first grade blended)
KW1W
KW1P
KW1B
KB1P
KB1W
KB1B

The Hierarchical Linear Model

A two level longitudinal hierarchical linear model (HLM) identifies two levels, a within-person level and a between-person level, and creates models relating the variables of interest at each level. Level 1 describes the individual growth trajectory, where reading achievement is regressed onto measures of time. For this study, examination of reading achievement plots over time suggested that reading growth was non-linear, with rapid initial growth that tailed off over time. Consequently, a quadratic growth model for reading achievement was specified where the regression coefficient for the intercept (to be defined at several important points) represented achievement at the time point, the regression coefficient for time represented the instantaneous growth rate at that time point, and the regression coefficient for time squared represented the instantaneous curvature or acceleration rate at that time point.

Consequently, the within-person model contains individual growth parameters that determine the trajectory of true individual change over time (Bryk & Raudenbush, 2002, p. 162.). For the observed status of individual i at time t, Y_{ti}, is a function of the growth trajectory plus random error where, π_{0i}, represents achievement at time t, π_{1i} represents instantaneous growth at time t and π_{2i} represents the instantaneous curvature:

$$Y_{ti} = \pi_{0i} + \pi_{1i}(\text{Time}) + \pi_{2i}(\text{Time})^2 + \epsilon_{ti} \quad (1)$$

Level 2 describes the between person explanatory portion of the model, where level 1 parameters are specified as functions of level 2 variables. This study follows the common practice of building this portion of the model in steps. The first “unconditional” model merely specified the growth curve parameters as fixed or random and provides a beginning partitioning of variance between level 1 and level 2:

$$\pi_{0i} = \beta_{00} + \mu_{0j} \quad (2)$$

$$\pi_{1i} = \beta_{10} + \mu_{1j} \quad (3)$$

$$\pi_{2i} = \beta_{20} \quad (4)$$

where μ_{0i} and μ_{1i} represents the unexplained portions of the variable. β coefficients represent the relationship between the selected characteristics and the individual growth parameters (Willett et al., 1998). For all analyses, the curvature parameter was fixed, so that the level 2 equation for that parameter was always $\pi_{2i} = \beta_{20}$.

At later stages of model building, explanatory variables were added and their influence assessed. Following the unconditional models, three additional models were estimated. First, background variables were added, control variables next, and finally dummy variables for the types of reading instruction. The final level 2 models were as follows:

$\beta_0 = G_{00} + G_{01}$*(Gender) + G_{02}*(Black) + G_{03}*(Hispanic) + G_{04}*(Asian) + G_{05}*(Other) + G_{06}*(Home Language) + G_{07}*(SES) + G_{08}*(Ability) + G_{09}*(KP1W) +G_{010}*(KP1B) + G_{011}* (KW1P) + G_{012}*(KW1W) + G_{013}*(KW1B) + G_{014}* (KB1P) + G_{015}*(KB1W) + G_{016}*(KB1B) + U_{00}

β_1= = $G_{10} + G_{11}$*(Gender) + G_{12}*(Black) + G_{13}*(Hispanic) + G_{14}*(Asian) + G_{15}* (Other) + G_{16}*(Home Language) + G_{17}*(SES) + G_{18}*(Ability) + G_{19}*(KP1W) +G_{110}*(KP1B) + G_{111}* (KW1P) + G_{112}*(KW1W) + G_{113}*(KW1B) + G_{114}* (KB1P) + G_{115}*(KB1W) + G_{116}*(KB1B) + U_{10}

β_2 = = $G_{20} + G_{21}$*(Gender) + G_{22}*(Black) + G_{23}*(Hispanic) + G_{24}*(Asian) + G_{25}* (Other) + G_{26}*(Home Language) + G_{27}*(SES) + G_{28}*(Ability) + G_{29}*(KP1W) +G_{210}*(KP1B) + G_{211}* (KW1P) + G_{212}*(KW1W) + G_{213}*(KW1B) + G_{214}* (KB1P) + G_{215}*(KB1W) + G_{216}*(KB1B)

The four sequential models (unconditional, background, background + control, and background + control +instruction) were then estimated at four time points: spring kindergarten, spring first grade, spring third grade, and spring fifth grade. This was accomplished by centering the time variable for the spring month of each of those grades (described in more detail in the next section).

Creation of the ECLS-K Data Set

The ECLS-K data were collected guided by a framework of children's development in relation to their schooling, family, and community interaction, with measures of student achievement in reading, mathematics, and science, teacher and principal questionnaires, and parent interviews. A multistage probability sample design was used to select a national representative sample of children attending kindergarten in 1998-1999. The first stage of the selection was to identify geographic areas consisting of various counties in different regions of the United States. The second stage was to select both public and private schools in the sampled counties, and the third stage was to select students within the schools. The base year included a national representative sample of 21, 260 kindergarten children in 1,280 schools. Base year data were collected in the fall of 1998 and spring of 1999. An additional four waves were collected in the fall and spring semesters of first grade, and the spring semester for third and fifth grade.

The ECLS-K data files are available for public use in seven different CD based electronic codebooks (ECBs). There are four cross sectional and three longitudinal ECBs. The K-5 longitudinal data file was developed for longitudinal study purposes and includes all children that completed a parent interview or a child assessment in fifth grade and were included in K-1 and K-3 longitudinal data files. There were also164 fifth-grade children who were included in the K-5

files because they had completed the fifth grade, a parent interview and a child assessment, in addition to completing of at least one round of parent interviews and child assessments in either fall kindergarten or spring kindergarten, fall first grade or spring first grade, or spring third grade or fall fifth grade.

Building upon the six other data files, the K-5 longitudinal data file contains recalibrated assessment scores and new and corrected base-year composites. The variables that describe the children's background included their home environment, composition of their families, communities, socio-economic status, cognitive abilities, and academic readiness. School information, such as teachers' credentials, instructional methods, classroom environment, and school characteristics that affected children's performance were also included in the dataset. The K-5 data file is a student level data file only, with all teacher and school level variables linked directly to the student.

The data file for this study was developed in a series of steps. Once variables were identified, the K-5 ECB was used to write a SPSS syntax file that was then used to create a SPSS data file. An appropriate weight was selected, and missing data were recoded and estimated. The final data file was then used for the factor and cluster analyses in SPSS, and also used to create the two data files necessary for HLM.

This study used five of the six time points of the ECLS-K-5 child assessment data (fall kindergarten, spring kindergarten, spring first grade, spring third grade, and spring fifth grade). Fall first grade was a 30% sample used to study the effect of summer loss on students and was not used in this analysis. As recommended by the NCES, the weighting variable C1_6FC0 (Mean = 218.46, SD = 524.25, Min = 0, Max = 6867.64) was applicable for use with kindergarten to fifth grade analyses, resulting in a sample size of 9796 (ECLS K-5 Manual,

2004, p. 9-5). This weight was normalized by multiplying C1_6FC0 by the ratio of sample size (9796) to weight sum of 3,837,337. This normalized weight was applied to the SPSS data file, but the unnormalized weight was used at level 2 for the HLM analysis because HLM automatically normalizes the weight.

Before the weight was applied to the sample, the sample size for the K-5 data file was 17,565. Of these 8,985 were male, 8,569 were females, and 11 of unknown gender participated in the fall kindergarten assessments. Ethnic origins included 9,891 children who were white (non Hispanic), 2,494 children who were Black (non-Hispanic), 3,062 children who were Hispanic, 1,115 children of Asian or Pacific Islander origin; 316 children who were American Indian or Alaskan Native, and 201 children who were native Hawaiian and other Pacific islander. Of the participants, 448 children were of unknown race-ethnicity.

After the C1_6FC0 weight was applied, the final sample size was 9,796. Table 3.3 summarizes the students' background. There were 4,895 (50%) male students and 4,901 (50%) female students. Following ethnic group recoding, 58.1% of the students were Caucasian, 10.9% were African American, 18.4% of the students were Hispanic, 6.9% were Asian students, and 5.8% of the students were other race such as Native American, Native Alaskan, Pacific Islander, and mixed race. Eighty-five percent (84.7%) of the students spoke English at home and 15.3% of the students spoke non-English at home.

The use of C1_6FCO indentifies cases having five rounds of achievement data, but does not guarantee a complete data set without missing values. Table 3.2 summarizes the missing data on the variables of interest for this study; the strategy presented below describes how the missing values were handled.

After missing values, -9, -8, and -7 were indicated as system missing values in SPSS, the SPSS EM algorithm (Little & Rubin, 2003); from their Missing Values Module (SPSS, 2007) was used to estimate the missing values.

In the student level data, if the student missed all five reading scores, these cases were deleted; students that had at least one reading score from

Table 3.2

Summary of Missing Data

				Missing		No. of Extreme	
	N	Mean	SD	Freq.	%	Low	High
Gender	9796	1.50	0.50	0	0	0	0
Race	9778	2.20	1.80	12	0.1	0	566
Home Language	9524	1.85	0.35	266	2.7	1395	0
Spring K General Knowledge IRT	8976	23.06	7.52	820	8.4	38	206
Fall Kindergarten Reading IRT	8986	30.04	10.04	810	8.3	0	264
Spring Kindergarten Reading IRT	9293	41.63	13.58	503	5.1	0	405
Spring First Grade Reading IRT	9592	72.80	21.98	204	2.1	47	393
Spring Third Grade Reading IRT	9694	119.24	24.73	102	1	324	60
Spring Fifth Grade Reading IRT	9738	139.98	22.96	58	0.5	379	0
SES	9517	0.06	0.80	274	2.8	85	291
Weight Variable	9790	391.83	652.07	0	0		

kindergarten to fifth grade were included in the teacher level data, all teachers were included. The amount of missing data estimated in each variable was under 9%.

Missing values in the time variable were replaced with the month that most students were assessed. In child level file, 8.4% of fall kindergarten general knowledge IRT scores were missing, 8.3% of fall kindergarten, 5.1% of spring kindergarten, 2.1% of first grade, 1% of third grade, and 0.6% of fifth grade-reading IRT scores were missing and were imputed. Twelve missing values in race variable were imputed as were 274 kindergarten SES values were imputed.

Because factor and cluster analyses of teacher responses to items in the Spring Kindergarten and Spring First-grade Teacher Questionnaires were

necessary, and to avoid teacher data being implicitly weighted by student sample size, teacher item responses were aggregated across students so as to create two new teacher data files, one for each grade level. For analysis, teacher level variables were merged back into the student file. The spring kindergarten teacher sample size was 2692 and the spring first grade teacher sample size was 3509.

Table 3.3

Frequency Counts and Percentages for Demographic Variables (N = 9796)

Variable	Frequency	Percentage
Gender		
Male	4895	50.0
Female	4901	50.0
Ethnicity		
Caucasian, non-Hispanic	5687	58.1
African American, non-Hispanic	1065	10.9
Hispanic	1799	18.4
Asian	675	6.9
Other	566	5.8
Home language		
English	8289	84.7
Non-English	1501	15.3

In summary, the final data set consisted of a within student level data file (N=9,796) converted to a person-period data file (Singer & Willett, 2003) appropriate for longitudinal data analysis (N=48,980) and a between-student data file with student level predictor variables. Missing data were estimated using the EM algorithm, and data were appropriately weighted. The multilevel analysis

produced by HLM is currently thought to solve issues of correct standard error estimation so no further adjustments were made.

Instrumentation

This subsection describes each of the five sets of variables in more detail, and provides necessary descriptive statistics for variables included in the final analyses.

Achievement variables

Table 3.4 presents descriptive statistics for each of the reading IRT scores. Students' fall kindergarten general knowledge IRT scale scores were used as a predictor of children's reading growth over time. The score ranged from 1.02 to 46.12 with mean of 21.41 and standard deviation of 7.79. The IRT scores also show that the mean reading scaled score increased as children got older.

Table 3.4
Descriptive Statistics for Each of the Five Reading Achievement IRT Scores (n=9790)

	Min	Max	Mean	SD
Fall Kindergarten general knowledge IRT score	1.02	46.12	21.41	7.91
Fall kindergarten reading IRT score	7.18	124.28	28.62	10.06
Spring kindergarten reading IRT score	10.38	138.49	39.95	13.31
Spring first grade reading IRT score	18.85	163.12	70.70	22.63
Spring third grade reading IRT score	45.51	178.92	116.38	25.92
Spring fifth grade reading IRT score	59.12	181.22	137.29	24.02

The inter-correlations between the five reading scores are presented in Table 3.5. All the correlations were high (i.e., correlations ranged from .53 to .87) and statistically significant, suggesting consistency in reading scores over time.

Table 3.5
Correlations Among the Reading Scores

Variable	R1	R2	R3	R4
Reading IRT score 1				
Reading IRT score 2	.84**			
Reading IRT score 3	.69**	.78**		
Reading IRT score 4	.57**	.62**	.76**	
Reading IRT score 5	.53**	.59**	.73**	.87**

** significant at .001(two-tailed)

Time variables

Students were assessed in different months during each wave of data collection. In addition, it is important to scale time intentionally in longitudinal studies to aid interpretation. To create the time variables, the month when the assessment took place was recoded according to the chart in Table 3.6. September 1998 (the first month of fall kindergarten) was identified as the starting point and coded “0” months, and August 2004 (the last month of fifth grade) was identified as “71”, the last month of the study. Also shown are the months where most students were assessed; these months were used to estimate the few missing values for the “data tested” variable.

Background and control variables

There were three background (gender, race, home language) and two control variables (SES and Ability) use in this student.

Gender was obtained during the ECLS-K researchers’ school visits and were confirmed during the parent interviews (Walston & West, 2004, p. 127). The race composite variable was computed using the ethnicity and race variables from the parents’ interview. The race of the child was identified by the parents and was indicated as Caucasian, African American, Hispanic, Asian, Pacific Islander, Native Alaskan, and Native American. For this study, race was recoded as

Table 3.6
Time Conversion Table

	Kindergarten (1998-1999)	1st Grade (1999-2000)	3rd Grade (2001-2002)	5th Grade (2004-2005)
September	0	12	36	60
October	1**	13		
November	2	14		
December	3	15		
January	4	16		
February	5	17		65
March	6	18	42	66**
April	7	19	43**	67
May	8**	20**	44	68
June	9	21	45	69
July	10	22	46	70
August	11	23	47	71

Note ** indicates the month that most students were assessed.

Caucasian, African American, Hispanic, Asian, and Other (Pacific Islander, Native Alaskan, Native American, and mixed race).

Home language. Home language variable was a dichotomous variable that indicated whether the primary language the child used at home is English or not (p. 127, Walston & West, 2004).

SES. SES variable was computed according to the data collected during the parent interview. The components included: (a) father or male guardian's education; (b) mother or male guardian's education; (c) father or male guardian's occupation; (d) mother/female guardian's occupation; and (e) household income.

Ability. Ability variable was derived from fall kindergarten general knowledge IRT score. The general knowledge items measure students' two broad science competencies: "(a) conceptual understanding of scientific facts", and (b) skills to conduct query about the natural word. This test measured

students' skills of comprehending their environment and their ability draw inferences from the information presented to them (U.S. Department of Education, 2001).

Instruction variables

The reading instruction construct was based on factor analysis of reading instruction activity items in the Kindergarten and First-Grade Teacher Questionnaire. These self-report questionnaires indicated the amount of time spent on particular reading activities. Forty-two items from Kindergarten Teacher's Questionnaire (Questions 28, and 29) and 47 items from First Grade Teacher's Questionnaire (Questions 47 and 49) were included (See Appendix A for the reading instruction activity items in the Spring Kindergarten and Spring First Grade Teacher's Surveys).

Tables 3.7 and 3.8 present the descriptive statistics of how frequently kindergarten and first grade teacher use the activities in their reading instruction. One represents that the teacher *never* used the activity, two represents *once a month or less*, three represents *two or three times a month*, four represents *once or twice a week*, five represents *three or four times a week*, and six represents the teacher worked on the activity *daily*. The most frequent reading activities for kindergarten teachers was "*working on letter names*" (mean = 5.83, SD = .56) and other decoding activities. On average, kindergarten teacher only worked on *"alphabetizing"* activity once or twice a month. The most frequent used reading activities for first grade teacher was *"work on phonics"* (mean = 5.75, SD = .55), where first-grade teachers worked on phonics almost on daily base. *"Perform plays"* (mean = 2.03, SD = .77) appeared to be the least used activities among first-grade teachers.

Three additional items are examined to provide evidence on the construct validity of the factor and cluster analysis. Using a six-point Likert scale, items in the reading instruction questions asked teachers to identify how often they did a particular reading activity in their reading classroom. Question 30 in spring kindergarten and Question 50 in spring first grade teachers' survey are teacher's self-report on their attitude towards inventive spelling that was a major indicator of whole language instruction.

Question 48 in spring first grade teacher survey asked teacher to self-identify their reading instructional approach. A seven-point Likert scale was used. One indicated reading activity emphasizing on comprehending connected text. Four was emphasizing reading instruction on both approaches. Seven was emphasizing decoding skills.

Following the data analyses described in the next chapter under Research Question 1, three types of kindergarten and three types of first grade instruction are identified. Table 3.9indicates the kindergarten and first grade combined instruction groups. Students who received reading with controlled text and decoding instruction in kindergarten and first grade are labeled as KP1P. Students who received reading with controlled text and decoding instruction in kindergarten and reading instruction using meaningful text in first grade are labeled as KP1W. Students who received reading with controlled text and Table decoding instruction in kindergarten and blended instruction in first grade are labeled as KP1B.

Table 3.7
Descriptive Statistics of Spring Kindergarten Reading Instruction Activities (N= 2692)

Reading Activity Items	Mean	SD
Q28A Work on letter names	5.83	0.56
Q28B Writing alphabet	5.53	0.78
Q28C Work on new vocabulary	5.40	0.82
Q28D Dictate stories	4.00	1.29
Q28E Work on phonics	5.78	0.58
Q28F Read story/see print	5.54	0.84
Q28G Red story / don't see print	4.14	1.94
Q28H Retell stories	4.32	1.14
Q28I Read aloud	4.80	1.33
Q28J Basal reading texts	2.31	1.78
Q28K Read silently	4.22	1.84
Q28L Use work books/sheets	4.05	1.77
Q28M Write from dictation	2.87	1.75
Q28N Write with invented spelling	4.81	1.38
Q28O Choose books to read	5.16	1.19
Q28P Write stories/report	3.40	1.70
Q28Q Work related to book	4.11	1.26
Q28R Publish own writing	2.48	1.37
Q28S Perform plays/skits	2.24	.98
Q28T Write in journal	3.96	1.72
Q28U Frequency of story tellers	2.18	1.14
Q28V Work in mixed level groups	4.55	1.65
Q28W Peer tutoring	3.43	1.71
Q29A Convention of print	5.51	1.00
Q29B Alphabet and letter recognition	5.82	0.61
Q29C Matching letters to sounds	5.78	0.56
Q29D Writing own name	5.60	1.00
Q29E Rhyming words and word families	4.65	1.03
Q29F Reading multi-syllable words	2.70	1.80
Q29G Common prepositions	3.91	1.51
Q29H Identify main idea of story	4.18	1.58
Q29I Make predictions based on text	4.93	1.12
Q29J Use cues for comprehension	4.53	1.54
Q29K Communicate ideas orally	5.38	.99
Q29L Follow complex directions	5.32	1.04
Q29M Use capitalization /punctuation	4.31	1.78
Q29N Compose/write complete sentences	3.73	1.90
Q29O Story has beginning/middle/end	2.26	1.60
Q29P Conventional spelling	3.04	1.97
Q29Q Vocabulary	4.40	1.83
Q29R Alphabetizing	2.10	1.59
Q29S Reading aloud fluently	3.09	2.01
Q30 Encourage use of invented spelling	4.30	1.00

Table 3.8

Descriptive Statistics of Spring First-Grade Reading Instruction Activities (N= 3509)

Reading Activity Items	Mean	SD
Q47A Work on letter names	4.22	1.92
Q47B Writing alphabet	5.00	1.38
Q47C Work on new vocabulary	5.55	.65
Q47D Dictate stories	3.30	1.47
Q47E Work on phonics	5.75	.55
Q47F Read story/see print	5.11	1.10
Q47G Red story / don't see print	4.81	1.53
Q47H Retell stories	4.44	1.02
Q47I Read aloud	5.54	.68
Q47J Read silently	5.63	.73
Q47K Use work books/sheets	4.93	1.23
Q47L Write from dictation	4.29	1.18
Q47M Write with invented spelling	5.41	.84
Q47N Choose books to read	5.62	.66
Q47O Read text with controlled vocabulary	5.30	.94
Q47P Read phonetic patterns	5.04	1.09
Q47Q Read patterned text	5.00	.96
Q47R Read literature based text	4.90	1.06
Q47S Write stories / report	4.38	1.10
Q47T Work related to book	4.13	1.05
Q47U Publish own writing	2.95	1.16
Q47V Perform plays/skits	2.03	.77
Q47W Write in journal	4.47	1.44
Q47X Frequency of story tellers	2.17	1.11
Q47Y Work in mixed level groups	4.23	1.46
Q47Z Peer tutoring	3.83	1.42
Q47AA Work projects in small group	3.72	1.26
Q47BB Work long projects	2.24	1.08
Q49A Convention of print	3.34	2.09
Q49B Alphabet and letter recognition	3.69	2.07
Q49C Matching letters to sounds	4.73	1.71
Q49D Writing own name	3.89	2.06
Q49E Rhyming words and word families	4.71	1.06
Q49F Reading multi-syllable words	4.60	1.27
Q49G Common prepositions	3.96	1.41
Q49H Identify main idea of story	4.80	.98
Q49I Make predictions based on text	5.16	.84
Q49J Use cues for comprehension	5.34	.82
Q49K Communicate ideas orally	5.52	.75
Q49L Follow complex directions	5.27	.97
Q49M Use capitalization /punctuation	5.72	.59
Q49N Compose/write complete sentences	5.55	.69
Q49O Story has beginning/middle/end	4.25	1.21
Q49P Conventional spelling	5.26	.93
Q49Q Vocabulary	5.41	.80
Q49R Alphabetizing	3.85	1.10
Q49S Reading aloud fluently	5.42	.80
Q48 Approach to teaching reading	4.11	.68
Q50 Encourage use of invented spelling	4.26	.88

Table 3.9
List of Kindergarten and First-Grade Combined Instruction Groups

Instruction		Combined Instruction
Kindergarten	First Grade	Group
Meaningful Text (W)	Controlled Text & Decoding (P)	KW1P
Meaningful Text (W)	Meaningful Text (W)	KW1W
Meaningful Text (W)	Blended (B)	KW1B
Print Concept & Decoding (P)	Controlled Text & Decoding (P)	KP1P
Print Concept & Decoding (P)	Meaningful Text (W)	KP1W
Print Concept & Decoding (P)	Blended (B)	KP1B
Blended (B)	Controlled Text & Decoding (P)	KB1P
Blended (B)	Meaningful Text (W)	KB1W
Blended (B)	Blended (B)	KB1B

Students who received reading instruction using meaningful text in kindergarten and first grade were labeled as KW1W. Students who received reading instruction using meaningful text in kindergarten and reading with controlled vocabulary text and decoding instruction in first grade was labeled as KW1P. Students who received reading instruction using meaningful text in kindergarten and blended instruction in first grade were labeled as KW1B.

Students who received balanced reading instruction in kindergarten and first grade were labeled as KB1B. Students who received balanced reading instruction in kindergarten and reading instruction using meaningful text in first grade was labeled as KB1W. Students who received balanced reading instruction in kindergarten and reading using controlled vocabulary and decoding instruction in first grade were labeled as KB1P.

As shown in Table 3.10 eight dummy variables were created to indicate eight types of kindergarten and first grade instruction: KP1W, KP1B, KW1W, KW1P, KW1B, KB1B, KB1W, and KB1P. The reference group was reading with controlled vocabulary and decoding instruction in kindergarten and first grade (KP1P).

Table 3.10
List of Dummy Variables

	D1	D2	D3	D4	D5	D6	D7	D8
KP1W	1	0	0	0	0	0	0	0
KP1B	0	1	0	0	0	0	0	0
KW1P	0	0	1	0	0	0	0	0
KW1W	0	0	0	1	0	0	0	0
KW1B	0	0	0	0	1	0	0	0
KB1W	0	0	0	0	0	1	0	0
KB1P	0	0	0	0	0	0	1	0
KB1B	0	0	0	0	0	0	0	1

Summary

The current study extracted the data set from ECLS kindergarten to fifth grade data file. After applying the recommended weight and deleting cases that did not have data on all variables, the final sample size was 9790. Two stages were involved in creating data files for analyses. The first stage was to identify the types of reading instruction in kindergarten and first grade using factor and cluster analysis. Each student was assigned to one of the nine reading instructional groups. The second stage was to incorporate the reading instruction in to the data files for HLM analysis in Stage Two.

A two-level HLM analyses was used to identify the effectiveness of reading analysis. The level 1 file included five time variables, each centered at the end of a different grade level, and for each grade level the growth slope, time

squared variables as the curvature slope, and students' reading achievement scores as outcome variables (n= 48,950). Level 2 file included background, control, and instruction variables (N = 8460). Different models were tested at each time point (spring kindergarten, spring first grade, spring third grade, and spring fifth grade). The status of students' reading achievement score, the instantaneous growth rate, and the instantaneous acceleration rate of students' reading achievement growth were estimated at each time point. The results are presented in the next chapter.

CHAPTER 4

RESULTS

The main purposes of this study were to define the reading instruction constructs using the Early Childhood Longitudinal Study Kindergarten Class, 1998-1999 (ECLS-K) Kindergarten and First-Grade Teacher Questionnaires and to examine the effectiveness of different types of reading instruction over time. This chapter presents the results of the data analyses addressing the following two research questions:

1. What type of instruction was provided to the kindergarten and first grade students based on the ECLS-K Kindergarten and First-Grade Teacher Questionnaire?
2. What is the relationship between types of reading instruction and reading achievement and growth at kindergarten, first, third, and fifth grade? Does the type of reading instruction students received in kindergarten and first grade influence reading achievement in third and fifth grade?

Research Question One

Research Question One asked how to best characterize teacher's reading instruction in kindergarten and first grade from the 42 items in the Kindergarten Teacher Questionnaire and the 49 items in the First Grade Teacher Questionnaire. The items come from Question 28 and 29 the Kindergarten Teacher Questionnaire and from Question 47 and 48 in the First Grade Teacher Questionnaire.

The general strategy was to first factor analyze the Teacher Questionnaire item data and to generate factor scores on the factors, and second, to use cluster analysis to identify groups of teachers with similar patterns of factor scores

across the factors. This is done below for spring Kindergarten and spring First Grade Teacher Questionnaire items.

Factor Analysis

Spring Kindergarten Teacher Questionnaire

Forty-two items were factor analyzed using principal component extraction with varimax rotation. This was a principal component analysis (rather than a factor analysis), with 1's entered on the main diagonal. Eigenvalues greater than 1 and scree plots were examined to determine the number of factors. There were 10 eignevalues greater than 1, but the scree plot suggested 4 factors.

Table 4.1 presents the findings of the factor analysis, with items ranked ordered and only loadings greater than .40 shown. Four factors were interpreted: (a) reading through meaningful activities; (b) activities to introduce concepts of print; (c) comprehension activities; and (d) decoding activities. Eleven activities did not load highly onto any of the components (i.e., items 28C, 28F, 28G, 28H, 28I, 28K, 28L, 28U, 28V, 28W, and 29E), and were not included in successive analyses.

The first component was defined as Reading With Meaning Text Activities (Factor 1). The highest-loading item in this component, "writing with inventive spelling" (.72), and the other three items that loaded over .60, "writing in journal" (.72), "writing story/report" (.71) and "publish own writing" (.63) defined this factor. These reading activities were identified as whole language instruction in most literature (Burns & Richgels,1995; Ehri & Wilce, 1987).

The second component was defined as Print Concept Instructional Activities (Factor 2). Items 9 to 18 were identified as activities that focused on introduction concept of prints. The two highest-loading items, "reading aloud

Table 4.1

Factor Analysis Result of Reading Activity Items in Spring Kindergarten Teacher Questionnaire

		Meaningful Text	Concept of prints	Comp	Decode
1.	28N Write with invented spelling	0.72			
2.	28T Write in journal	0.72			
3.	28P Write stories/report	0.71			
4.	28R Publish own writing	0.63			
5.	28O Choose books to read	0.55			
6.	28D Dictate stories	0.51			
7.	28Q Work related to book	0.51			
8.	28S Perform plays/skits	0.44			
9.	29S Reading aloud fluently		0.72		
10.	29P Conventional spelling		0.66		
11.	28M Write from dictation		0.57		
12.	29M Use capitalization /punctuation		0.56		
13.	29R Alphabetizing		0.54		
14.	29N Compose/write complete sentences	0.43	0.54		
15.	29F Reading multi-syllable words		0.53		
16.	28J Basal reading texts		0.53		
17.	29O Story has beginning/middle/end		0.52		
18.	29Q Vocabulary		0.46		
19.	29I Make predictions based on text			0.71	
20.	29K Communicate ideas orally			0.66	
21.	29H Identify main idea of story			0.65	
22.	29J Use cues for comprehension			0.64	
23.	29L Follow complex directions			0.55	
24.	29G Common prepositions			0.48	
25.	29C Matching letters to sounds				0.74
26.	29B Alphabet and letter recognition				0.73
27.	28A Work on letter names				0.71
28.	28E Work on phonics				0.58
29.	28B Writing alphabet				0.57
30.	29D Writing own name				0.41
31.	29A Convention of print			0.40	0.41
32.	28C Work on new vocabulary				
33.	28F Read story/see print				
34.	28G Red story / don't see print				
35.	28H Retell stories				
36.	28I Read aloud				
37.	28K Read silently				
38.	28L Use work books/sheets				
39.	28U Frequency of story tellers				
40.	28V Work in mixed level groups				
41.	28W Peer tutoring				
42.	29E Rhyming words and word families				

fluently" (.72) and "conventional spelling" (.66), were the key indicators of concept of print training. In addition, items such as "writing from dictation" (.57), "use capitalization' (.56), "basal reading text" (.53), and "compose and write complete sentences" (.54) were also indicators for print concept training.

The third component was Reading Comprehension Activities (Factor 3). Items 19 to 24 appeared to be reading comprehension activities. Items that loaded over .60 characterized this factor. These items were "making predictions based on text (.71), "communicate ideas orally" (.66), "identify main idea of story" (.65), and "use cues for comprehension" (.64).

The fourth component was Decoding Activities (Factor 4). Items 25 to 31 appeared to be decoding instructional activities. Items that loaded over .4 in each component are listed in Table 4.1. Three highly loaded factors, "Matching letters to sounds" (.74), "alphabet and letter recognition" (.73) and "work on letter names" (.71) suggest Component 4 as a decoding instruction approach. Table 4.2 presents the summary of each component.

Correlations with Question 30 "Teacher's attitude towards inventive spelling," were used to provide some evidence on the whole language factors. Teachers' attitude towards encouraging students to use invented spelling was negatively correlated with the instruction factor that focused on teaching print concept ($r=-.06$, $p<.01$) and teaching decoding ($r=.01$, ns) and was positively correlated with instruction that teach reading with meaningful text ($r=.26$, $p<.01$). This result suggested that the more the teachers encourage inventive spelling, the more the teachers tended to use more meaningful text in their instruction.

Spring First Grade Teacher Questionnaire

Forty-nine items were factor analyzed using principal component extraction with varimax rotation to factor analyze reading items in Spring First Grade

Table 4.2

Items Measuring Instructional Practices at The Kindergarten Level

Reading with meaningful text (whole language)	Introducing concept of prints	Comprehension	Decoding (Phonics)
• Write with invented spelling • Write in journal • Write stories/report • Publish own writing • Choose books to read • Dictate stories • Work related to book • Perform plays/skits • Write with invented spelling • Write in journal • Write stories/report • Publish own writing • Choose books to read • Dictate stories	• Reading aloud fluently • Conventional spelling • Write from dictation • Use capitalization /punctuation • Alphabetizing • Compose/write complete sentences • Reading multi-syllable words • Basal reading texts • Story has beginning /middle/end • Vocabulary	• Make predictions based on text • Communicate ideas orally • Identify main idea of story • Use cues for comprehension • Follow complex directions • Common prepositions	• Matching letters to sounds • Alphabet and letter recognition • Work on letter names • Work on phonics • Writing alphabet • Writing own name • Convention of print

Teacher Questionnaire. Again, this was a principal component analysis (rather than a factor analysis, with 1's entered on the main diagonal. Eigenvalues greater than 1 and scree plots were examined to determine the number of factors. There were 11 eignevalues greater than 1, but the scree plot suggested 4 factors.

Table 4.3 presents the findings of the factor analysis. Items that have loadings greater than .40 were shown and ranked ordered. Four factors were derived: (a) using meaningful and connected text; (b) comprehension skills; (c)

phonics decoding skills; and (d) phonics instruction using controlled vocabulary. The factor analysis results of the first grade term practices are presented in Table 4.3.

Ten activities did not load highly onto any of the components (i.e., 47 C, 47D, 47F, 47G, 47J, 47N, 47X, 49G, 49P, and 49R). Thus, these items were not included in successive analyses. Different from the factor analysis results from Spring kindergarten reading with controlled text, was derived from the questions.

The first component was identified as Reading With Meaning Text Activities (Factor 1). Thirteen items (1 to 13) that loaded highly onto this. Highly loading items, such as “write stories/report” (.64), “ work in projects in small groups“(.63), and “publish own writing (.62), defined this factor as reading with meaningful text instruction.

The second component was identified as Reading Comprehension Activities (Factor 2). Items 14 to 22 were loaded into this factor. Items loaded over .60 - “use cues for comprehension (.66), “make predictions based on text (.63), “use capitalization” (.62), and “communicate idea orally” (.61) - defined this factor.

The third component was identified as Decoding Activities (Factor 3). Items 23 to 29 were loaded into this factor. The items with high loading scores defined this factor. The items were: “alphabet and letter name recognition” (.83), “writing own name” (.75), “matching letters to sounds” (.73), “convention of print (.72), and “work on letter names” (.69).

The fourth component was identified as Reading With Controlled Vocabularies (Factor 4). Items 30 to 37 were loaded into this factor. The three highest loading items, phonetic patterns” (.73); “read controlled vocabulary” (.67), “read and “read patterned text” (.58) define this component.

Table 4.3

Factor Analysis Result of Reading Activity Items in Spring First Grade Teacher Survey

	Meaningful text	Comp	Decode	Controlled text
1. Q47S Write stories / report	0.64			
2. Q47AA Work projects in small group	0.63			
3. Q47U Publish own writing	0.62			
4. Q47T Work related to book	0.58			
5. Q47BB Work long projects	0.55			
6. Q49O Story has beginning/middle/end	0.53			
7. Q47V Perform plays/skits	0.52			
8. Q47W Write in journal	0.51			
9. Q47Y Work in mixed level groups	0.51			
10. Q47M Write with invented spelling	0.49			
11. Q47R Read literature based text	0.46			
12. Q47H Retell stories	0.45			
13. Q47Z Peer tutoring	0.44			
14. Q49J Use cues for comprehension		0.66		
15. Q49I Make predictions based on text		0.63		
16. Q49M Use capitalization /punctuation		0.62		
17. Q49K Communicate ideas orally		0.61		
18. Q49N Compose/write complete sentences		0.59		
19. Q49H Identify main idea of story		0.58		
20. Q49L Follow complex directions		0.53		
21. Q49Q Vocabulary		0.51		
22. Q49F Reading multi-syllable words		0.40		
23. Q49B Alphabet and letter recognition			0.83	
24. Q49D Writing own name			0.75	
25. Q49C Matching letters to sounds			0.73	
26. Q49A Convention of print			0.72	
27. Q47A Work on letter names			0.69	
28. Q47B Writing alphabet			0.55	
29. Q49E Rhyming words and word families			0.42	
30. Q47P Read phonetic patterns				0.73
31. Q47O Read text with controlled vocabulary				0.67
32. Q47Q Read patterned text				0.58
33. Q47K Use work books/sheets				0.49
34. Q47I Read aloud				0.47
35. Q47E Work on phonics				0.46
36. Q47L Write from dictation				0.45
37. Q49S Reading aloud fluently		0.41		0.42
38. Q47C Work on new vocabulary				
39. Q47D Dictate stories				
40. Q47F Read story/see print				
41. 47G Read story don't see print				
42. 47J Read silently				
43. Q47N Choose books to read				
44. Q47X Frequency of story tellers				
45. Q49G Common prepositions				
46. Q49P Conventional spelling				
47. Q49R Alphabetizing				

Table 4.4 sums up the findings in defining reading instruction components for spring first grade Because the third and the fourth components were both based on systematically teaching students reading, and were components in the broad phonics instruction, these two factors were both classified as phonics instruction in classifying reading instruction.

Table 4.4
Summary of Items Measuring Instructional Activities at the First Grade Level

Meaningful activities	Comprehension	Decoding	Controlled text
• Write stories / report • Work projects in small group • Publish own writing • Work related to book • Work long projects • Story has beginning/middle/end • Perform plays/skits • Write in journal • Work in mixed level groups • Write with invented spelling • Read literature based text • Retell stories • Peer tutoring	• Use cues for comprehension • Make predictions based on text • Use capitalization /punctuation • Communicate ideas orally • Compose/write complete sentences • Identify main idea of story • Follow complex directions • Vocabulary • Reading multi-syllable words	• Alphabet and letter recognition • Writing own name • Matching letters to sounds • Convention of print • Work on letter names • Writing alphabet • Rhyming words and word families	• Read phonetic patterns • Read text with controlled vocabulary • Read patterned text • Use work books/sheets • Read aloud • Work on phonics • Write from dictation • Reading aloud fluently

The correlation between Question 48 (“Self-definition of reading instruction”) and Question 50 (“Teacher’s attitude towards inventive spelling”) in the Spring first grade term teacher’s survey was examined as a simple construct validity test in order to validate the reading instruction factor.

Correlation of the reading with meaningful text factor and teacher's approach to reading instruction were negatively correlated (-.21). Correlation of the phonics factors were positively correlated (.06 and .11). Meaningful text factor and teacher's attitude towards inventive spelling were positively correlated (0.12), while phonics factors were negatively correlated (-.02 and -.06) with teacher's attitude.

To sum up, four reading instruction components were identified for kindergarten teachers and four components were identified for first grade teachers. In kindergarten, reading instructional approaches includes: reading with meaningful text, introducing print concept, decoding, and comprehension. In first grade, reading instructional approaches includes: reading with meaningful text, reading with controlled vocabularies, decoding, and comprehension. Groups of teachers that have different instructional behaviors using different combinations of the components will be identified in the following sub-session, Cluster Analysis. Findings will be discussed.

Cluster Analyses

In order to group teachers into categories related to types of reading instruction, factor scores were generated from the final factor analysis solution and then a two-step cluster analysis were performed on the factor scores. Log-likelihood was used for a distance measure. Clustering Bayesian Criterion (BIC) and Akaike's Information Criterion (AIC) were both tested in running the analysis.

Kindergarten Instruction

Initial cluster analysis for the Spring Kindergarten Teacher Questionnaire yielded seven different instruction patterns of reading instruction. The clusters were various combinations of the amount of time teachers spend working on decoding, reading with meaningful text, print concept, and comprehension

activities: (a) instruction using meaningful activities with focus on print concept; (b) instruction using meaningful activities with focus on comprehension; (c) instruction using both meaningful text and decoding activities with focus on print concept; (d) instruction using both meaningful text and decoding activities with focus on comprehension; (e) instruction using both meaningful text and decoding activities with focus on both comprehension and print concept; (f) instruction using decoding activities with focus on both comprehension and print concept and had low meaningful activities; and (g) instruction using decoding activities with focus on both comprehension and print concept and had moderate meaningful activities.

For the HLM analyses, these seven clusters were combined into three groups for several reasons. First, there are too many groups for HLM analyses. Second, the main purpose of the current study was to compare reading with meaningful text (whole language approach), systematic reading (phonics approach), and blended instruction. Third, for each of the three main groups, split each groups into a high and low comprehension groups. So it was easy to reduce the number of the groups by not differentiating comprehension instruction. Therefore, these seven groups were combined into three instruction groups by specifying three clusters in analysis: reading instruction focused on using meaningful text and activities, reading instruction focused on decoding activities, and blended instruction (evenly incorporate phonics and whole language activities). Table 4.5 indicates the final cluster analysis results. The factor scores were converted to T scores for ease of interpretation (mean = 50; SD = 10, min = 0; max = 100).

Three clusters were defined: (a) instruction groups focused on reading with meaningful text, (b) reading instruction using decoding activities, and (c) focusing

blended reading instruction. In the reading with meaningful text practice group, the pattern of teachers' instructional behavior appeared to focus more on the meaning making activities and introducing print concept but did not incorporate any reading comprehension and decoding activities. In decoding groups,

Table 4.5
T Score of the Cluster Analysis Result For Kindergarten Reading Instruction Clusters

	Meaningful Text	Print Concept	Comprehension	Decoding	N
Whole Language (instruction groups focused on reading with meaningful text)	50.25	49.91	38.12	40.64	510
Decoding (reading instruction using decoding activities)	46.01	45.39	52.49	52.21	1408
Blended (blended reading instruction)	57.09	58.44	53.29	52.15	774

teachers appeared to spend most of their classroom time in doing decoding activities (52.21) and reading comprehension (52.49) but spend relatively little time in reading with meaningful text (46.01). For the blended instruction groups, teachers appeared to distribute their time across all four activities.

First Grade Instruction

Initial cluster analysis for Spring First Teacher Questionnaire yielded six different instruction patterns of reading instruction. Again, the clusters were various combination of the amount of time teachers spend for working on decoding, reading with controlled vocabularies, reading with meaningful text, and comprehension activities: (a) blended instruction with high comprehension; (b) blended instruction with no comprehension; (c) blended instruction with moderate

comprehension; (d) instruction using both controlled vocabularies and decoding; (e) instruction using meaningful activities and read with controlled vocabularies; and (f) instruction using meaningful activities without any decoding or reading with controlled vocabularies.

Again, because the purpose of the current study was to compare meaningful text (whole language approach), systematic reading (phonics approach), and blended instructional approach comprehension items were controlled. Therefore, for the HLM analysis, these six groups were combined into three instruction groups: reading instruction focused on using meaningful text and activities, reading instruction focused on decoding and reading with controlled vocabulary activities, and blended instruction (evenly incorporate phonics and whole language activities). Table 4.6 indicated the final cluster analysis results The factor scores were converted to T scores for ease of interpretation (mean = 50; SD = 10, min = 0; max = 100).

Table 4.6
T Score of the Cluster Analysis Result for First Grade Reading Instruction Clusters

	Meaningful Text	Comprehension	Decoding	Controlled Vocabulary	N
Blended (blended reading instruction)	50.03	51.62	56.04	51.49	1985
Whole Language (instruction groups focused on reading with meaningful text)	52.02	43.24	47.13	36.67	610
Decoding (reading instruction using decoding activities)	48.60	51.00	38.80	55.65	914

In the blended practice group, teachers spent equal amount of their class time working on meaning-making, decoding, and reading with controlled vocabulary activities .In the whole language (reading with meaningful text) instruction group, teachers spent most of their time in reading with meaningful text and did not incorporate reading comprehension activities. The frequency of working on decoding was very low. In the decoding practice group, the teachers focused on developing student's decoding skills and read with controlled text. The frequency of comprehension skills was moderate and Their frequency of reading with meaningful activities was very low.

To determine the reading instruction students received in both kindergarten and first grade, nine reading groups were defined, as shown in Table 4.7. These groups are (a) kindergarten phonics, first grade term phonics (KP1P); (b) kindergarten phonics, first grade term whole language (KP1W); (c) kindergarten phonics, first grade term blended (KP1B); (d) kindergarten whole language, first

Table 4.7
Definition of Reading Instruction Group at The Spring First Grade

Kindergarten instruction	First grade instruction	Reading group
Phonics	Phonics	KP1P
Phonics	Whole Language	KP1W
Phonics	Blended	KP1B
Whole Language	Phonics	KW1P
Whole Language	Whole Language	KW1W
Whole Language	Blended	KW1B
Blended	Phonics	KB1P
Blended	Whole Language	KB1W
Blended	Blended	KB1B

grade term phonics (KW1P); (e) kindergarten whole language, first grade term whole language (KW1W); (f) kindergarten whole language, first grade term

blended (KW1B); (g) kindergarten blended, first grade term phonics (KB1P); (h) kindergarten blended; first grade term whole language (KB1W); and (i) kindergarten blended, first grade term blended (KB1B).

Table 4.8 indicates the number of students in each reading instruction group. There were 13% of the students who received decoding and read with controlled vocabulary instruction (phonics) in kindergarten and first grade. There were 8.90% of the students received phonics instruction in kindergarten and read with meaningful text (whole language) instruction in first grade. There were 30.80% of students who received phonics instruction in kindergarten and blended instruction in first grade. There were 5.60% of students who received whole language in kindergarten and phonics instruction in first grade, while 3.50% of students received whole language instruction in both kindergarten and first grade, and 9.40% of students received whole language in kindergarten and blended instruction in first grade. There were 6.60% of students who received

Table 4.8
Frequencies of Reading Instruction Group

Reading Instruction	Frequencies	Percent
KP1P	1272	13.0
KP1W	873	8.9
KP1B	3013	30.8
KW1P	550	5.6
KW1W	339	3.5
KW1B	922	9.4
KB1P	649	6.6
KB1W	423	4.3
KB1B	1217	12.4
Missing	539	5.5
Total	9796	100

blended instruction in kindergarten and phonics in first grade, 4.30% of students who received blended instruction in kindergarten and whole language in first grade, and 12.40% of students who received blended instruction in both kindergarten and first grade.

Dummy variables were created prior to analysis. For reading instruction, eight dummy variables were created. Table 4.9 presented the summary of the dummy variables. The reference group was the group that received both phonics instruction in kindergarten and first grade (KP1P).

Table 4.9
List of Dummy Variables

	D1	D2	D3	D4	D5	D6	D7	D8
KP1W	1	0	0	0	0	0	0	0
KP1B	0	1	0	0	0	0	0	0
KW1P	0	0	1	0	0	0	0	0
KW1W	0	0	0	1	0	0	0	0
KW1B	0	0	0	0	1	0	0	0
KB1W	0	0	0	0	0	1	0	0
KB1P	0	0	0	0	0	0	1	0
KB1B	0	0	0	0	0	0	0	1

Research Question Two

Research Question Two asked what is the relationship among types of reading instruction and reading achievement and growth at kindergarten, first, third, and fifth grade and what is the influence of the type of reading instruction students received in kindergarten and first grade on reading achievement in third and fifth grade? To answer research question Two, four hierarchical linear modeling (HLM) procedures with time-centered at (a) spring kindergarten; (b) at spring first grade (c) at spring third grade; (d) and at spring fifth grade were employed. Several two-level and three-level models were tested. Because reading growth was known not to be linear (MaCoach et al., 2006), intercepts

(initial status) and slopes (growth rate) at each time point were estimated. Time was the first level predictor and gender, ethnicity, home language, socioeconomic status, ability (kindergarten general knowledge IRT score), and instructional group were second level predictors. Within each model, three incremental models that with each model adding a group of background, control and instruction variables. The development of the models were discussed in Chapter 3.

Level 1 variables were students' reading achievement IRT scores from kindergarten to fifth grade, and the five time covariates (from spring kindergarten, spring first grade, spring third grade, and spring fifth grade). The model estimated initial reading scores, as well as four reading slopes and curvature over the four time points (spring kindergarten, spring first grade, spring third grade term, and spring fifth grade). The level 1 model is shown by the following:

$$Y = \beta_0 + \beta_1*(\text{Time}) + \beta_2 (\text{Time})^2 + \mu$$

Y is the child's reading IRT score at a given time point. The intercept, β_0, is the child's reading achievement score at the end of the school year. β_1 is the instantaneous growth rate in each month for the student after the school year. Time is the elapsed time in the number of months from the initial assessment. β_2 is the assessment month squared to capture the curvature or acceleration in each growth trajectory.

The full Level 2 model included students' background variables (gender and ethnicity), background (SES, home language, ability), and instruction type (KP1W, KP1B, KW1P, KW1W, KW1B). Because ability and SES do not have a meaningful zero value, they were centered at *grand mean* for all analyses. The final Level 2 model is

$\beta_0 = G_{00} + G_{01}*(\text{Gender}) + G_{02}*(\text{Black}) + G_{03}*(\text{Hispanic}) + G_{04}*(\text{Asian}) + G_{05}*(\text{Other}) + G_{06}*(\text{Home Language}) + G_{07}*(\text{SES}) + G_{08}*(\text{Ability}) + G_{09}*(\text{KP1W}) + G_{010}*(\text{KP1B}) + G_{011}*(\text{KW1P}) + G_{012}*(\text{KW1W}) + G_{013}*(\text{KW1B}) + G_{014}*(\text{KB1P}) + G_{015}*(\text{KB1W}) + G_{016}*(\text{KB1B}) + U_{00}$

$\beta_1 = G_{10} + G_{11}*(\text{Gender}) + G_{12}*(\text{Black}) + G_{13}*(\text{Hispanic}) + G_{14}*(\text{Asian}) + G_{15}*(\text{Other}) + G_{16}*(\text{Home Language}) + G_{17}*(\text{SES}) + G_{18}*(\text{Ability}) + G_{19}*(\text{KP1W}) + G_{110}*(\text{KP1B}) + G_{111}*(\text{KW1P}) + G_{112}*(\text{KW1W}) + G_{113}*(\text{KW1B}) + G_{114}*(\text{KB1P}) + G_{115}*(\text{KB1W}) + G_{116}*(\text{KB1B}) + U_{10}$

$\beta_2 = G_{20} + G_{21}*(\text{Gender}) + G_{22}*(\text{Black}) + G_{23}*(\text{Hispanic}) + G_{24}*(\text{Asian}) + G_{25}*(\text{Other}) + G_{26}*(\text{Home Language}) + G_{27}*(\text{SES}) + G_{28}*(\text{Ability}) + G_{29}*(\text{KP1W}) + G_{210}*(\text{KP1B}) + G_{211}*(\text{KW1P}) + G_{212}*(\text{KW1W}) + G_{213}*(\text{KW1B}) + G_{214}*(\text{KB1P}) + G_{215}*(\text{KB1W}) + G_{216}*(\text{KB1B})$

Child-Level Model of Reading Growth

Variances were explained by the addition of variables: child background, characteristics, and instruction type. It was found that 10.95% to 13.15% of variance was found to be due to the child's characteristics (gender, race, and home language). Socioeconomic status, ability and instruction type explained most of the variance (28.51% to 32.73%). Table 4.10 presents the summary of variance explained in each model.

Table 4.10
Variance Explained by The Full Models at The Spring Kindergarten, First Grade, Third Grade, And Fifth Grade

	Variance explained by children's characteristics	Variance explained by the full model
Spring kindergarten	10.95%	39.47%
Spring first grade	12.38%	45.11%
Spring third grade	13.15%	45.39%
Spring fifth grade	12.28%	42.62%

p<.001

Table 4.11 to Table 14 presents the development of each of the four models at each time point, spring kindergarten, spring first grade, spring third grade, and spring fifth grade. First, the base model (Model 1) was estimated. The intercept of Model 1 represents the average reading achievement score of all students in the spring of each grade. The slope represents the average instantaneous reading achievement growth rate of all students in the spring of each grade. The curvature represents the instantaneous achievement acceleration in the spring of each grade. The intercept, slope, and curvature in Model 2 represent the average score and growth rate for Caucasian male students that spoke English at home. The intercept, slope, and curvature in Model 3 represent the average score and growth rate for Caucasian male students with average ability and SES that spoke English at home. The intercept, slope, and curvature in full model (Model 4) represent the average score and growth rate for Caucasian male students with average ability and SES that spoke English at home and received phonics instruction in both kindergarten and first grade.

Effects on initial reading status

End of spring kindergarten. Table 4.11shows the development of the reading achievement growth model, with the Level 1 time variable centered at spring kindergarten. The initial model indicates that the average reading score for kindergarten student was 48.08 ($p<.001$).

In the second model, background variables – race and home language - are added. The average reading score for a Caucasian male student that spoke English at home was 48.08 ($p<.001$). Caucasian students had higher reading achievement scores than students of other ethnicity, except Asian students, at the spring kindergarten when students' ability and SES were not controlled.

Table 4.11
The Influence of Background, Covariate, and Instructional Variables on Spring Kindergarten Achievement (Intercept), Instantaneous Growth Rate (slope), and Instantaneous Growth Curvature Rate (Curvature)

		Base Model		**Model 2**		**Model 3**		**Model 4**	
		β	SE	β	SE	β	SE	β	SE
Intercept		48.08**	.15	49.53**	.22	45.54**	.19	44.98**	.22
Background	Female			2.08**	.27	2.70**	.23	2.68**	.23
	African American			-7.13**	.41	1.90**	.40	1.70**	.23
	Hispanic			-5.22**	.33	.59*	.38	.40*	.37
	Asian			1.78**	.61	5.09**	.57	4.89**	.35
	Native American, Alaskan, Pacific Islander (NAP)			-4.52**	.82	-.21**	.64	-.30**	.51
	HL Non- English			-5.44**	.52	1.09**	.44	1.06**	.02
Covariate	Ability					.88**	.02	.88**	.54
	SES					3.37**	.19	3.36**	.41
Instruction	Whole Language							.50**	.39
	Blended							1.84**	.26
Reference Group		All students		White male students that speak English at home		White male students that speak English at home with average SES and average ability		White male students that speak English at home with average SES and average ability that received phonics instruction on kindergarten	

* p<.01 ** p<.001

Table 4.11(continue)
The Influence of Background, Covariate, and Instructional Variables on Spring Kindergarten Achievement (Intercept), Instantaneous Growth Rate (slope), and Instantaneous Growth Curvature Rate (Curvature)

		Base Model		**Model 2**		**Model 3**		**Model 4**	
		β	SE	β	SE	β	SE	β	SE
Slope		2.99**	.01	3.12**	.01	2.91**	.02	2.91**	.02
Background	Female			.11**	.02	.14**	.02	.14**	.02
	African American			-.65**	.03	-.16**	.03	-.16**	.03
	Hispanic			-.35**	.03	-.03**	.03	-.03**	.03
	Asian			-.04**	.04	.15**	.04	.15**	.04
	NAP			-.46**	.04	-.23**	.05	-.23**	.05
	HL Non- English			-.28**	.03	.08**	.04	.08**	.04
Covariate	Ability					.05**	.002	.05**	.001
	SES					.16**	.01	.16**	.01
Instruction	Whole Language							-.02**	.02
	Blended							-.008**	
Reference Group		All students		White male students that speak English at home		White male students that speak English at home with average SES and average ability		White male students that speak English at home with average SES and average ability that received phonics instruction on kindergarten	

* p<.01 ** p<.001

Table 4.11(continue)
The Influence of Background, Covariate, and Instructional Variables on Spring Kindergarten Achievement (Intercept), Instantaneous Growth Rate (slope), and Instantaneous Growth Curvature Rate (Curvature)

		Base Model		**Model 2**		**Model 3**		**Model 4**	
		β	SE	β	SE	β	SE	β	SE
Curvature		-.02**	-.0001	-.02**	0.0002	-.02**	.0002	-.02**	.0002
Background	Female			-.001**	0.0003	-.002**	.0002	-.002**	.0002
	African American			.005**	0.0004	-.0008**	.0004	.0008	.0004
	Hispanic			.005**	0.0004	-.0003**	.0004	.0003	.0004
	Asian			-.001**	0.0005	-.002**	.0005	-.002**	.0005
	NAP			.004**	0.0007	.002**	.0006	.002**	.0006
	HL Non- English			.003**	0.0004	-.0004**	.0005	-.0005	.0005
Covariate	Ability					-.001**	.00005	-.0005**	.0002
	SES					-.002**	.0002	-.002**	.0001
Instruction	Whole Language							.0002	.0004
	Blended							-.0002	.0003
Reference Group		All students		White male students that speak English at home		White male students that speak English at home with average SES and average ability		White male students that speak English at home with average SES and average ability that received phonics instruction on kindergarten	

* p<.01 ** p<.001

Table 4.12
The Influence of Background, Covariate, and Instructional Variables on Spring First Achievement (Intercept), Instantaneous Growth Rate (slope), and Instantaneous Growth Curvature Rate (Curvature)

		Base Model		**Model 2**		**Model 3**		**Model 4**	
		β	S.E.	β	S.E.	β	S.E.	β	S.E.
Intercept		77.38**	.21	80.09**	.32	74.26**	.28	73.46**	.43
Background	Female			2.88**	.39	3.80**	.32	3.74**	.32
	African American			-12.87**	.63	.30*	.57	.21	.57
	Hispanic			-8.17**	.65	.29*	.54	.14*	.54
	Asian			1.13*	.89	6.03**	.70	5.78**	.70
	NAP			-8.55**	1.15	-2.24**	.86	-2.32**	.86
	HL Non- English			-7.66**	.74	1.89*	.60	1.92**	.60
Covariate	Ability					1.31**	.03	1.30**	.03
	SES					4.65**	.25	4.56**	.25
Instruction	D1 KW1W							-6.05**	2.00
	D2 KW1P							-.27**	.93
	D3 KW1B							.60**	.78
	D4 KP1W							1.81**	.55
	D5 KP1B							-.46**	.50
	D6KB1W							2.94**	.64
	D7KB1P							2.05**	.71
	D8KB1B							1.24**	.57
Reference Group		All students		White male students that speak English at home		White male students that speak English at home with average SES and average ability		White male students that speak English at home with average SES and average ability that received phonics instruction on both kindergarten and first grade	

* p<.01 ** p<.001

Table 4.12 (continue)
The Influence of Background, Covariate, and Instructional Variables on Spring First Achievement (Intercept), Instantaneous Growth Rate (slope), and Instantaneous Growth Curvature Rate (Curvature)

		Base Model		**Model 2**		**Model 3**		**Model 4**	
		β	S.E.	β	S.E.	β	S.E.	β	S.E.
Slope		2.99**	.01	3.13**	.02	2.91**	.02	2.88**	.03
Background	Female			.02**	.02	.14**	.02	.14**	.02
	African American			-.65**	.03	-.16**	.03	-.15**	.03
	Hispanic			-.34**	.03	-.03**	.03	-.03*	.03
	Asian			-.04	.04	.15**	.04	.15**	.04
	NAP			-.46**	.06	-.23	.05	-.23**	.05
	HL Non- English			-.28**	.04	.08	.04	.08*	.04
Covariate	Ability					.05**	.001	.05**	.001
	SES					.16**	.01	.16**	.01
Instruction	D1 KW1W							-.22	.10
	D2 KW1P							.002	.05
	D3 KW1B							.04	.04
	D4 KP1W							.12**	.03
	D5 KP1B							-.004	.03
	D6KB1W							.05	.04
	D7KB1P							.06	.04
	D8KB1B							-.01	.03
Reference Group		All students		White male students that speak English at home		White male students that speak English at home with average SES and average ability		White male students that speak English at home with average SES and average ability that received phonics instruction on kindergarten and first grade	

* p<.01 ** p<.001

Table 4.12 (continue)
The Influence of Background, Covariate, and Instructional Variables on Spring First Achievement (Intercept), Instantaneous Growth Rate (slope), and Instantaneous Growth Curvature Rate (Curvature)

		Base Model		**Model 2**		**Model 3**		**Model 4**	
		β	S.E.	β	S.E.	β	S.E.	β	S.E.
Curvature		-.02**	.0001	-.02**	.0002	-.02**	.0002	-.02**	.0003
Background	Female			-.001**	.0003	-.002**	.0002	-002**	.0002
	African American			.006**	.0004	.0008	.0004	.001	.0004
	Hispanic			.003**	.0004	.0003	.0004	.0002*	.0004
	Asian			-.0006	.0005	-.002**	.0005	-.002**	.0005
	NAP			.004**	.0007	.002*	.0006	.002**	.0006
	HL Non- English			.003**	.0005	-.0005**	.0005	-.001	.0005
Covariate	Ability					-.0005**	.00002	-.0005**	.00002
	SES					-.002**	.0002	-.002**	.0002
Instruction	D1 KW1W							.003	.002
	D2 KW1P							.000005	.0007
	D3 KW1B							-.0005	.0006
	D4 KP1W							-.001*	.0004
	D5 KP1B							.000006	.0004
	D6KB1W							-.0009	.0005
	D7KB1P							-.001	.0005
	D8KB1B							-.0001	.0004
Reference Group		All students		White male students that speak English at home		White male students that speak English at home with average SES and average ability		White male students that speak English at home with average SES and average ability that received phonics instruction on both kindergarten and first grade	

* p<.01 ** p<.001

Table 4.13
The Influence of Background, Covariate, and Instructional Variables on Spring Third Grade Achievement (Intercept), Instantaneous Growth Rate (slope), and Instantaneous Growth Curvature Rate (Curvature)

		Base Model		**Model 2**		**Model 3**		**Model 4**	
		β	SE	β	SE	β	SE	β	SE
Intercept		120.29**	.26	124.57**	.40	116.89**	.35	116.10**	.55
Background	Female			3.39**	.49	4.61**	.40	4.55**	.39
	African American			-19.51**	.83	-2.22**	.73	-2.20*	.73
	Hispanic			-11.19**	.83	-.10**	.67	-.16	.68
	Asian			-.67	1.08	5.89**	.83	5.70**	.83
	NAP			-12.90**	1.47	-4.60**	1.07	-4.63**	1.07
	HL Non- English			-9.51**	.94	3.06**	.75	3.11**	.75
Covariate	Ability					1.75**	.03	1.74**	.03
	SES					5.74**	.30	5.63**	.31
Instruction	D1 KW1W							-5.94*	2.48
	D2 KW1P							-.22	1.17
	D3 KW1B							.75	.95
	D4 KP1W							2.45**	.68
	D5 KP1B							-.55	.64
	D6KB1W							2.73**	.77
	D7KB1P							1.74*	.90
	D8KB1B							.72	.71
Reference Group		All students		White male students tha t speak English at home		White male students that speak English at home with average SES and average ability		White male students that speak English at home with average SES and average ability that received phonics instruction on both kindergarten and first grade	

* p<.01 ** p<.001

Table 4.13(continue)
The Influence of Background, Covariate, and Instructional Variables on Spring Third Grade Achievement (Intercept), Instantaneous Growth Rate (slope), and Instantaneous Growth Curvature Rate (Curvature)

		Base Model		**Model 2**		**Model 3**		**Model 4**	
		β	SE	β	SE	β	SE	β	SE
Slope		2.99**	.01	3.13**	.02	2.91**	.02	2.89**	.03
Background	Female			.11**	.02	.14**	.02	.14**	.02
	African American			-.65**	.03	-.16**	.03	-.15**	.03
	Hispanic			-.35**	.03	-.03**	.03	-.03**	.03
	Asian			-.04**	.04	.15**	.04	.15**	.04
	NAP			-.46**	.06	-.23**	.05	-.23**	.05
	HL Non- English			-.28**	.04	.08*	.04	.08*	.04
Covariate	Ability					.05**	.002	.05	.002
	SES					.16**	.01	.16	.01
Instruction	D1 KW1W							-.22	.12
	D2 KW1P							.002	.06
	D3 KW1B							.04	.05
	D4 KP1W							.12**	.06
	D5 KP1B							-.004	.03
	D6KB1W							.05	.04
	D7KB1P							.06	.04
	D8KB1B							-.01	.03
Reference Group		All Students		White male students that speak English at home		White male students that speak English at home with average SES and average ability		White male students that speak English at home with average SES and average ability that received phonics Instruction on both kindergarten and first grade	

* p<.05 ** p<.001

Table 4.13(continue)
The Influence of Background, Covariate, and Instructional Variables on Spring Third Grade Achievement (Intercept), Instantaneous Growth Rate (slope), and Instantaneous Growth Curvature Rate (Curvature)

		Base Model		**Model 2**		**Model 3**		**Model 4**	
		β	SE	β	SE	β	SE	β	SE
Curvature		-.02**	0	-.02**	.0002	-.02**	.0002	-.02**	.0003
Background	Female			-.001**	.0002	-.002**	.0002	-.002**	.0002
	African American			.005**	.0004	.001	.0004	.001	.0004
	Hispanic			.003**	.0004	.0003	.0004	.0002*	.0004
	Asian			-.001	.0006	-.002**	.0005	-.002**	.001
	NAP			.004**	.0006	.002**	.0006	.002**	.001
	HL Non- English			.003**	.0004	-.0005	.0005	-.001	.0004
Covariate	Ability					-.0005**	.0002	-.0005**	.0002
	SES					-.002**	.00002	-.002**	.00002
Instruction	D1 KW1W							.003**	.002
	D2 KW1P							.000005	.0007
	D3 KW1B							-.0005	.0006
	D4 KP1W							-.001*	.0004
	D5 KP1B							.00001	.0004
	D6KB1W							-.0009	.0005
	D7KB1P							-.001	.0005
	D8KB1B							-.001	.0005
Reference Group		All Students		White male students that speak English at home		White male students that speak English at home with average SES and average ability		White male students that speak English at home with average SES and average ability that received phonics Instruction on both kindergarten and first grade	

*p<.01 ** p<.001

Table 4.14
The Influence of Background, Covariate, and Instructional Variables on Spring Fifth Grade Achievement (Intercept), Instantaneous Growth Rate (slope), and Instantaneous Growth Curvature Rate (Curvature)

		Base Model		**Model 2**		**Model 3**		**Model 4**	
		β	SE	β	SE	β	SE	β	SE
Intercept		142.27**	.24	146.84**	.37	139.75**	.33	139.45**	.51
Background	Female			2.43**	.46	3.58**	.37	3.54**	.37
	African American			-19.71**	.83	-.3.83**	.73	-3.78**	.73
	Hispanic			-10.36**	.77	-.19*	.62	-.19*	.63
	Asian			-3.11*	.99	3.07**	.78	2.98**	.78
	NAP			-12.32**	1.38	-4.66**	1.01	-4.66**	1.01
	HL Non- English			-7.90**	.87	3.67**	.72	3.72**	.72
Covariate	Ability					1.64**	.03	1.63**	.03
	SES					4.86**	.29	4.78**	.29
Instruction	D1 KW1W							-1.93**	2.31
	D2 KW1P							-.16**	1.04
	D3 KW1B							.38**	.88
	D4 KP1W							1.50**	.63
	D5 KP1B							-.63**	.60
	D6 KB1W							1.53**	.70
	D7 KB1P							.23**	.86
	D8 KB1B							.04**	.67
Reference Group		All Students		White male students that speak English at home		White male students that speak English at home with average SES and average ability		White male students that speak English at home with average SES and average ability that received phonics Instruction on both kindergarten and first grade	

* p<.01 ** p<.001

Table 4.14(continue)
The Influence of Background, Covariate, and Instructional Variables on Spring Fifth Grade Achievement (Intercept), Instantaneous Growth Rate (slope), and Instantaneous Growth Curvature Rate (Curvature)

		Base Model		**Model 2**		**Model 3**		**Model 4**	
		β	SE	β	SE	β	SE	β	SE
Slope		2.99**	.01	3.13**	.02	2.91**	.02	2.89**	.02
Background	Female			.11**	.02	.14**	.02	.14**	.02
	African American			-.65**	.03	-.16**	.03	-.15**	.03
	Hispanic			-.35**	.03	-.03**	.03	.03*	.03
	Asian			-.04**	.04	.15**	.04	.15**	.04
	NAP			-.46**	.06	-.23**	.05	-.23**	.05
	HL Non- English			-.28**	.04	.08**	.04	.08**	.04
Covariate	Ability					.05**	.002	.05**	.002
	SES					.16**	.01	.15**	.01
Instruction	D1 KW1W							-.22	.12
	D2 KW1P							.002	.06
	D3 KW1B							.04	.05
	D4 KP1W							.12**	.03
	D5 KP1B							-.004	.03
	D6KB1W							.05	.04
	D7KB1P							.06	.04
	D8KB1B							-.01	.03
Reference Group		All students		White male students		White male students that speak English at home with average SES and average ability		White male students that speak English at home with average SES and average ability that received phonics instruction on both kindergarten and first grade	

* p<.05** p<.001

Table 4.14 (continue)
The Influence of Background, Covariate, and Instructional Variables on Spring Fifth Grade Achievement (Intercept), Instantaneous Growth Rate (slope), and Instantaneous Growth Curvature Rate (Curvature)

		Base Model		**Model 2**		**Model 3**		**Model 4**	
		β	SE	β	SE	β	SE	β	SE
Curvature		-.02**	.0001	-.02**	.0002	-.02**	.0002	-.02**	.0003
Background	Female			-.001**	.0003	-.002**	.0002	-.002**	.0002
	African American			.005**	.0004	.001	.0004	.0007	.0004
	Hispanic			.003**	.0004	.0003	.0004	.0002	.0004
	Asian			-.001	.0005	-.002**	.0005	-.002**	.00004
	NAP			.004**	.0007	.002*	.0005	.002*	.00005
	HL Non- English			.003**	.0005	-.001	.0005	-.0005	.00006
Covariate	Ability					-.001**	.00002	-.0005**	.00002
	SES					-.002**	.0002	-.002**	.0002
Instruction	D1 KW1W							.003	.002
	D2 KW1P							.00001	.0007
	D3 KW1B							-.0005	.0006
	D4 KP1W							-.001	.0004
	D5 KP1B							.00001	.0004
	D6KB1W							-.0009	.0005
	D7KB1P							-.001	.0005
	D8KB1B							-.0001	.0004
Reference Group		All students		White male students		White male students that speak English at home with average SES and average ability		White male students that speak English at home with average SES and average ability that received phonics instruction on both kindergarten and first grade	

* p<.01 ** p<.001

Asian students performed 1.78 points higher (p<.001) than Caucasian students. Comparing to Caucasian students, African American students performed 7.13 (p<.001) points lower, Hispanic students performed 5.22 (p<.001) points lower, and students of other races (Native American, Alaskan, Pacific Islander) scored 4.52 (p<.001) points lower. Students that did not speak English at home performed 5.44 points lower (p<.001) than those who spoke English at home. Moreover, female students scored 2.08 points higher (p<.001) than male students.

The third model includes ability and SES in addition to the students' background variable. Controlling the effects of other variables, the higher the students' SES and the higher their fall kindergarten general knowledge score, the higher their reading achievement score at spring kindergarten. The average reading score for a Caucasian male student with average SES and ability that spoke English at home was 45.54 (p<.001). Asian students with average SES and ability that spoke English at home scored 5.09 points (p<.001) higher than the Caucasian students. Comparing with Caucasian students, African American students with average SES and ability scored 2.70 (p<.001) higher and Native American, Alaskan, and Pacific Islander students (NAP) scored .21 (p<.001) points lower. Students with average SES and ability whose home language was not English scored 1.09 (p<.001) than those whose home language is English.

The full model included reading instruction in addition to all variables in previous three models. Because first grade reading instruction is not included at this time point, there are only three reading instruction groups – phonics, whole language, blended. Phonics instruction is the reference group in this model.

Controlling for students' ability, SES, and kindergarten reading instruction, the average reading achievement score of a Caucasian male student who spoke

English at home with average ability and had an average SES and received decoding instruction in kindergarten was 44.98 ($p<0.001$). Female students scored 2.68 points higher ($p<.001$) than male students. Asian students with the same background scored 4.89 ($p<.001$) points higher than Caucasian students. African-American with the same background scored 1.70 ($p<.001$) points higher than Caucasian students. Students that did not speak English at home scored 1.06 higher ($p<.05$) than those who spoke English at home. Students who received whole language instruction scored .50 points ($p<.001$) higher than those who received phonics instruction. Students who received blended instruction in kindergarten scored 1.84 points ($p<0.001$) higher than students who received phonics instruction in kindergarten.

End of spring first grade. Table 4.12 shows the development of the reading achievement growth model, with the Level 1 time variable centered at spring first grade. The initial model indicates that the average reading score for kindergarten student was 77.38 ($p<.001$).

In the second model, background variables – race and home language - are added. The average reading score for a Caucasian male student that spoke English at home was 80.09 ($p<.001$). Caucasian students had higher reading achievement scores than students of other ethnicity, except Asian students, at the spring first grade. Asian students performed 1.13 (n.s.) points higher than Caucasian students. Comparing to Caucasian students, African American students performed 12.87 ($p<.001$) points lower, Hispanic students performed 8.17 ($p<.001$) points lower, and NAP students scored 8.55 ($p<.001$) points lower. Students that did not speak English at home performed 7.66 ($p<.001$) points lower than those who spoke English at home. Moreover, female students scored 2.88 ($p<.001$) points higher than male students.

The third model includes ability and SES in addition to the students' background variable. Controlling the effects of other variables, the higher the students' SES and the higher their fall kindergarten general knowledge score, the higher their reading achievement scores at spring first grade. The average reading score for a Caucasian male student with average SES and ability that spoke English at home was 74.26 ($p<.001$). Asian students with average SES and ability that spoke English at home scored 6.03 points ($p<.001$) higher than the Caucasian students. Comparing with Caucasian students, African American students with average SES and ability scored .30 (n.s.) higher and NAP students scored .21 ($p<.001$) points lower. Students with average SES and ability whose home language was not English scored 1.89 ($p<.001$) than those whose home language is English.

The full model included reading instruction in addition to all variables in previous three models. Nine reading instruction groups – KW1W, KW1P, KW1B, KP1P, KP1W, KP1B, KB1P, KB1W, and KB1B – were included. KP1P group is the reference group in this model.

Controlling for students' ability, SES, and reading instruction, the average reading achievement score of a Caucasian male student who spoke English at home with average ability and had an average SES and received decoding instruction in kindergarten was 73.46 ($p<0.001$). Female students scored 3.74 ($p<.001$) points higher than male students. Asian students with the same background scored 5.78 ($p<.001$) points higher than Caucasian students. African-American with the same background scored .21 (n.s.) points higher than Caucasian students. Students that did not speak English at home scored 1.92 ($p<.001$) higher than those who spoke English at home.

Students who received whole language instruction in both kindergarten and first grade (KW1W) scored 6.05 points ($p<.001$) lower than those who received phonics instruction in both grades (KP1P). Student that received phonics in kindergarten and whole language in first grade (KP1W) scored 1.81 ($p<.001$) points higher than the KP1P group. Students that received blended instruction in kindergarten and whole language instruction first grade (KB1W) scored 2.94 ($p<.001$) than the KP1P group. Students received blended instruction in kindergarten and phonics instruction in first grade (KB1P) group scored 2.05 ($p<.001$) points higher than KP1P group. Students received blended instruction in both grades (KB1B) scored 1.24 ($p<.05$) points higher than the KP1P group.

End of spring third grade. Table 4.13 shows the development of the reading achievement growth model, with the Level 1 time variable centered at spring third grade. The initial model indicates that the average reading score for kindergarten student was 120.29 ($p<.001$).

Background variables – race and home language - are added to the second model. The average reading score for a Caucasian male student that spoke English at home was 124.57 ($p<.001$). Caucasian students had higher reading achievement scores than students of other ethnicity expect Asian students at the spring third grade. Asian students performed .67 (n.s.) points lower than Caucasian students. The result, however, is not significant. Comparing to Caucasian students, African American students performed 19.51 ($p<.001$) points lower, Hispanic students performed 11.19 ($p<.001$) points lower, and NAP students scored 12.90 ($p<.001$) points lower. Students that did not speak English at home performed 9.51 ($p<.001$) points lower than those who spoke English at home. Moreover, female students scored 3.39 ($p<.001$) points higher than male students.

The third model includes ability and SES in addition to the students' background variable. Controlling the effects of other variables, the higher the students' SES and the higher their fall kindergarten general knowledge score, the higher their reading achievement scores at spring third grade. The average reading score for a Caucasian male student with average SES and ability that spoke English at home was 116.89 ($p<.001$). Asian students with average SES and ability that spoke English at home scored 5.89 points ($p<.001$) higher than the Caucasian students. Comparing with Caucasian students, African American students with average SES and ability scored 2.22 ($p<.05$) higher and NAP students scored 4.60 ($p<.001$) points lower. Students with average SES and ability whose home language was not English scored 3.06 ($p<.001$) than those whose home language is English.

Controlling for students' ability, SES, and reading instruction, the average reading achievement score of a Caucasian male student who spoke English at home with average ability and had an average SES and received KP1P reading instruction was 116.10 ($p<0.001$). Female students scored 4.55 ($p<.001$) points higher than male students. Asian students with the same background scored 5.70 ($p<.001$) points higher than Caucasian students. African-American with the same background scored 2.20 ($p<.05$) points lower than Caucasian students. NAP students scored 4.63 ($p<.001$) lower than Caucasian students. Students that did not speak English at home scored 3.11 ($p<.001$) higher than those who spoke English at home.

Student that received phonics in kindergarten and whole language in third grade (KP1W) scored 2.45 ($p<.001$) points higher than the KP1P group. Students that received blended instruction in kindergarten and whole language instruction third grade (KB1W) scored 2.73 ($p<.001$) than the KP1P group.

End of spring fifth grade. Table 4.14 shows the development of the reading achievement growth model, with the Level 1 time variable centered at spring third grade. The initial model indicates that the average reading score for kindergarten student was 142.27 ($p<.001$).

In the second model, background variables – race and home language - are added. The average reading score for a Caucasian male student that spoke English at home was 146.84 ($p<.001$). Caucasian students had higher reading achievement scores than students of other ethnicity at the spring third grade. Asian students performed 3.11 ($p<.05$) points lower than Caucasian students. Comparing to Caucasian students, African American students performed 19.71 ($p<.001$) points lower, Hispanic students performed 10.36 ($p<.001$) points lower, and NAP students scored 12.32 ($p<.001$) points lower. Students that did not speak English at home performed 7.90 ($p<.001$) points lower than those who spoke English at home. Moreover, female students scored 2.43 ($p<.001$) points higher than male students.

The third model includes ability and SES in addition to the students' background variable. Controlling the effects of other variables, the higher the students' SES and the higher their fall kindergarten general knowledge score, the higher their reading achievement scores at spring third grade. The average reading score for a Caucasian male student with average SES and ability that spoke English at home was 139.75 ($p<.001$). Asian students with average SES and ability that spoke English at home scored 3.07 points ($p<.001$) higher than the Caucasian students. Comparing with Caucasian students, African American students with average SES and ability scored 3.83 ($p<.05$) lower and NAP students scored 4.66 ($p<.001$) points lower. Students with average SES and

ability whose home language was not English scored 3.67 ($p<.001$) than those whose home language is English.

Controlling for students' ability, SES, and reading instruction, the average reading achievement score of a Caucasian male student who spoke English at home with average ability and had an average SES and received KP1P reading instruction was 139.45 ($p<0.001$). Female students scored 3.54 ($p<.001$) points higher than male students. Asian students with the same background scored 2.98 ($p<.001$) points higher than Caucasian students. African-American with the same background scored 3.78 ($p<.05$) points lower than Caucasian students. NAP students scored 4.66 ($p<.001$) lower than Caucasian students. Students that did not speak English at home scored 3.72 ($p<.001$) higher than those who spoke English at home.

Students that received KB1W instruction scored 1.53 points higher than the KP1P group. Students that received KP1W instruction scored 1.50 points higher than the KP1P group. The KW1B group scored .38 points higher than the KP1P group. Students in KB1P group scored .23 points higher than the KP1P group.

Students that received KW1P group received .16 points lower than the KP1P group. Students that received KP1B instruction scored .63 points lower thatn the KP1P group. Students that received KW1W instruction scored 1.963 points lower than the KP1P group.

Effects on growth trajectory

End of spring kindergarten. The results in Table 4.11 indicates that the average instantaneous reading ability growth rate of the four models - base model (Model 1), model with background variables (Model 2), model with background and covariate variables (Model 3), and full model (Model 4). The

reading achievement growth rate of an average kindergarten student at spring kindergarten was 2.99 ($p<.001$).

Model Two includes the background variables. On average, the growth rate of Caucasian, English-speaking male students that spoke English at home was 3.12 ($p<.001$) points per month. The average growth rate of female students was higher than male students (estimate = .11, $p<.001$). The growth rate per month of African American (estimate = .65, $p<.001$), Hispanic students (estimate = .35, $p<.001$), and NAP students (estimate = .46, $p<.001$) were slower than Caucasian students. The growth rate of students that did not spoke English at home was .28 ($p<.001$) points slower per month than students that spoke English at home.

Model Three includes the background, SES, and ability variables. The higher the child's socioeconomic status, the faster his or her reading growth rate was. The average growth rate of a Caucasian male student with average SES and ability that spoke English at home was 2.91. The growth rate of female students was .14 ($p<.001$) points faster than male students per month. The growth rate of African American was .16 ($p<.001$) points slower than Caucasian students per month. The growth rate of Asian students was .15 ($p<.001$) points faster than Caucasian students per month. The growth rate of students that did not spoke English at home was .08 ($p<.05$) points faster than students that spoke English at home per month.

The final model indicated that the average growth rate of Caucasian male students with average SES and ability whose home language was English and received phonics instruction was 2.91 ($p<.001$) points per month. Female students had higher reading growth rates than male students (estimate = .14, $p<.001$). Asian students had faster reading growth rates (estimate = .15, $p<.05$)

than Caucasian students per month. African American (estimate = .16, p<.001) and NAP students had slower reading growth rates (estimate = .23, p<.001) than Caucasian students per month. The growth rate of students who did not speak English at home was .08 points (p<.001) faster than the Caucasian students. Kindergarten reading instruction had no significant effect on students' reading growth rate after kindergarten.

End of spring first grade. The results in Table 4.12 (b) indicates that the average instantaneous reading ability growth rate of the four models - base model (Model 1), model with background variables (Model 2), model with background and covariate variables (Model 3), and full model (Model 4).
The reading achievement growth rate of an average kindergarten student at spring kindergarten was 2.99 (p<.001).
Model Two includes the background variables. On average, the growth rate of Caucasian, English-speaking male students that spoke English at home was 3.13 (p<.001) points per month. The average growth rate of female students was African American (estimate = .65, p<.001), Hispanic students (estimate= .34, p<.001), and NAP students (estimate = .46, p<.001) were slower than Caucasian students. The growth rate of students that did not spoke English at higher than male students (estimate = .02, p<.001). The growth rate per month of home was .28 (p<.001) points slower per month than students that spoke English at home.

Model Three includes the background, SES, and ability variables. The higher the child's socioeconomic status, the faster his or her reading growth rate was. The average growth rate of a Caucasian male student with average SES and ability that spoke English at home was 2.91. The growth rate of female students was .14 (p<.001) points faster than male students per month. The

growth rate of African American was .16 (p<.001) points slower than Caucasian students per month. The growth rate of Asian students was .15 (p<.001) points faster than Caucasian students per month. The growth rate of students that did not spoke English at home was .08 (p<.05) points faster than students that spoke English at home per month.

The final model indicated that the average growth rate of Caucasian male students with average SES and ability whose home language was English and received phonics instruction was 2.88 (p<.001) points per month. Female students had higher reading growth rates than male students (estimate = .14, p<.001). Asian students had faster reading growth rates (estimate = .15, p<.05) than Caucasian students per month. African American (estimate = .16, p<.001) and NAP students had slower reading growth rates (estimate = .23, p<.001) than Caucasian students per month. The growth rate of students who did not speak English at home was .16 points (p<.001) faster than the Caucasian students. Kindergarten reading instruction had no significant effect on students' reading growth rate after kindergarten.

End of spring third grade and end of spring fifth grade. Students' reading achievement growth rate stays the same for both spring third and spring fifth grade. The results in Table 4.13 and Table 4.14 indicates that the average instantaneous reading ability growth rate of students at spring third and fifth Table grade. The reading achievement growth rate of an average kindergarten student at spring kindergarten was 2.99 (p<.001).

Model Two includes the background variables. On average, the growth rate of Caucasian, English-speaking male students that spoke English at home was 3.13 (p<.001) points per month. The average growth rate of female students was higher than male students (estimate = .11, p<.001). The growth rate per month of African American (estimate = .65, p<.001), Hispanic students (estimate

= .34, p<.001), and NAP students (estimate = .46, p<.001) were slower than Caucasian students. The growth rate of students that did not spoke English at home was .28 (p<.001) points slower per month than students that spoke English at home.

Model Three includes the background, SES, and ability variables. The higher the child's socioeconomic status, the faster his or her reading growth rate was. The average growth rate of a Caucasian male student with average SES and ability that spoke English at home was 2.91. The growth rate of female students was .14 (p<.001) points faster than male students per month. The growth rate of African American was .16 (p<.001) points slower than Caucasian students per month. The growth rate of Asian students was .15 (p<.001) points faster than Caucasian students per month. The growth rate of students that did not spoke English at home was .08 (p<.05) points faster than students that spoke English at home per month.

The final model indicated that the average growth rate of Caucasian male students with average SES and ability whose home language was English and received phonics instruction was 2.88 (p<.001) points per month. Female students had higher reading growth rates than male students (estimate = .14, p<.001). Asian students had faster reading growth rates (estimate = .15, p<.05) than Caucasian students per month. African American (estimate = .15, p<.001) and NAP students had slower reading growth rates (estimate = .23, p<.001) than Caucasian students per month. The growth rate of students who did not speak English at home was .08 points (n.s.) faster than the Caucasian students. Kindergarten reading instruction had no significant effect on students' reading growth rate after kindergarten.

Effect on Instantaneous Acceleration Rate (Curvature)

Table 4.11, 4.12, 4.13, and 4.14 indicate the curvatures of the models in each grade. Because the curvature of the models was the same across from each grade and the coefficients were close to zero, the curvature rates are not discussed in this study. Negative curvature coefficients, however, indicated the regression was concave downward. Even though the reading growth rate are consistent after first grade, the negative curvature coefficient indicates that reading growth slows down if there are no addition reading instruction that facilitates students' reading development.

Summary of the Results

According to the reading instruction items in Spring Kindergarten and First Grade Teacher Questionnaires, reading instruction concerning four different reading skill sets can be defined in each grade. For kindergarten, reading instruction includes (a) reading with meaningful text and activities; (b) introducing print concept; (c) comprehension; and (d) decoding. More than half of the kindergarten teachers (52.30%) focused on decoding activities in their classroom. Only 18.95% of the kindergarten teachers used meaningful text and activities as the focus of their instruction.

For first grade, reading instruction includes: (a) reading with meaningful text and activities; (b) comprehension; (c) decoding, and reading with controlled vocabulary. Most of the teachers (56.57%) of the first grade teachers incorporated meaningful activities, decoding, and reading with controlled vocabularies in their classrooms. This group of teachers is indentified as blended instruction group. Only 17.38% of teachers used meaningful activities and did not incorporate decoding instruction in their reading classrooms. The finding indicated the trend in 1998 to 2000 that early reading instruction was moving towards blended approach rather than using a single instructional approach.

Table 4.15 summarizes all HLM models in the study. Overall, female students had better reading achievement scores and faster growth rate across the grades compared to boys. Asian students had higher reading achievement scores and faster growth rate across the grades than students of other race after controlling for SES and ability scores. The gap between Caucasian students and Asian students widened in first and third grade but narrowed at fifth grade.

After controlling for SES and ability scores, African-American students had higher initial reading achievement score than Caucasian students at spring kindergarten. Their reading performance, however, declined from spring first grade. The gap between African-American students and Caucasian students widened as the progressed to the lower grade.

The reading achievement scores and growth rate of Native American, Alaskan, and Pacific Islander students were lower than the ones of Caucasian students and Asian students. The gap between this group and the Caucasian students widen in the first and third grade but narrowed at fifth grade.
Students that received phonics instruction performed lower than those who received whole language and blended instruction. Students that received phonics instruction in kindergarten continued to perform lower than students that received blended instruction in kindergarten. Whole language instruction did not have significant effect on students' first, third, and fifth grade reading achievement. Blended instruction, however, had significant effect on student's reading achievement on each group regardless what combination the students received. Students that received blended in kindergarten and phonics in first grade had higher reading achievement scores at first and third compared to other groups. The effect, however, became non-significant at fifth grade. Whole language instruction at the first grade with the blended instruction in kindergarten did not have significant result in first and third grade but had positive significant effect at

fifth grade reading achievement. This result suggested that whole language instruction did not have short term effect on students' reading achievement. Instead, the effect of whole language instruction can be seen at the end of fifth grade if students were introduced decoding at earlier grade. Chapter 5 further discusses this issue and connection of the results with Chall's (1983) literacy development theory.

Table 4.15
Summary of Final Growth Models

		Kindergarten		First Grade		Third Grade		Fifth Grade	
		β	SE	β	SE	β	SE	β	SE
Intercept		44.98**	.22	73.46**	.43	116.10**	.55	139.45**	.51
Background	Female	2.68**	.23	3.74**	.32	4.55**	.39	3.54**	.37
	African American	1.70**	.23	0.21	.57	-2.20*	.73	-3.78**	.73
	Hispanic	.40*	.37	0.14	.54	-.16	.68	-.19**	.63
	Asian	4.89**	.35	5.78**	.70	5.70**	.83	2.98**	.78
	NAP	-.30	.51	-2.32*	.86	-4.63**	1.07	-4.66**	1.01
	HL Non- English	1.06*	.02	1.92**	.60	3.11**	.75	3.72**	.72
Covariate	Ability	.88**	.54	1.30**	.03	1.74**	.03	1.63**	.03
	SES	3.36**	.41	4.56**	.25	5.63**	.31	4.78**	.29
Instruction	Whole Language	.50	.39						
	Blended	1.84**	.26						
	D1 KW1W			-6.05**	2.00	-5.94	2.48	-1.93	2.31
	D2 KW1P			-.27**	.93	-.22	1.17	-.16	1.04
	D3 KW1B			.60**	.78	.75	.95	.38	.88
	D4 KP1W			1.81**	.55	2.45**	.68	1.50	.63
	D5 KP1B			-.46**	.50	-.55	.64	-.63	.60
	D6KB1W			2.94**	.64	2.73**	.77	1.53	.70
	D7KB1P			2.05**	.71	1.74	.90	.23	.86
	D8KB1B			1.24**	.57	.72	.71	.04	.67
Reference Group		White male students that speak English at home with average SES and average ability that received phonics instruction		White male students that speak English at home with average SES and average ability that received phonics instruction on both kindergarten and first grade					

* p<.01 ** p<.001

Table 4.15 (continue)
Summary of Final Growth Models

		Kindergarten		First Grade		Third Grade		Fifth Grade	
		β	SE	β	SE	β	SE	β	SE
Slope		2.91**	.02	2.88**	.03	2.88**	.03	2.89**	.02
Background	Female	.14**	.02	.14**	.02	.14**	.02	.14**	.02
	African American	-.16**	.03	-.15**	.03	-.15**	.03	-.15**	.03
	Hispanic	-.03**	.03	-.03**	.03	-.03	.03	.03**	.03
	Asian	.15**	.04	.15**	.04	.15**	.04	.15**	.04
	NAP	-.23**	.05	-.23**	.05	-.23**	.05	-.23	.05
	HL Non- English	.08**	.04	.08*	.04	.08	.04	.08	.04
Covariate	Ability	.05**	.001	.05**	.001	.05	.002	.05**	.002
	SES	.16**	.01	.16**	.01	.16	.01	.15**	.01
Instruction	Whole Language	-.02	.02						
	Blended	-.008	.01						
	D1 KW1W			-.22	.10	-.22	.12	.-22	.12
	D2 KW1P			.002	.05	.002	.06	.002	.06
	D3 KW1B			.04	.04	.04	.05	.04	.05
	D4 KP1W			.12**	.03	.12**	.06	.12**	.03
	D5 KP1B			-.004	.03	-.004	.03	-.004	.03
	D6KB1W			.05	.04	.05	.04	.05	.04
	D7KB1P			.06	.04	.06	.04	.06	.04
	D8KB1B			-.01	.03	-.01	.03	-.01	.03
Reference Group		White male students that speak English at home with average SES and average ability that received phonics instruction		White male students that speak English at home with average SES and average ability that received phonics instruction on both kindergarten and first grade					

* p<.01 ** p<.001

Table 4.15 (continue)
Summary of Final Growth Models

		Kindergarten		**First Grade**		**Third Grade**		**Fifth Grade**	
		β	SE	β	SE	β	SE	β	SE
Curvature		-.02**	.0002	-.02**	.0003	-.02**	.0003	-.02**	.0003
Background	Female	-.002**	.0002	-002**	.0002	-.002**	.0002	-.002**	.0002
	African American	.001	.0004	.001	.0004	0.001	.0004	.0007	.0004
	Hispanic	.0003	.0004	.0002*	.0004	.0002*	.0004	.0002	.0004
	Asian	-.002**	.0005	-.002**	.0005	-.002**	.001	-.002**	.00004
	NAP	.002**	.0006	.002**	.0006	.002**	.001	.002*	.00005
	HL Non- English	-.0005	.0005	-.001	.0005	-.001	.0004	-.0005	.00006
Covariate	Ability	-.0005**	.0002	-.0005**	.00002	-.0005**	.0002	-.0005**	.00002
	SES	-.002**	.0001	-.002**	.0002	-.002**	.00002	-.002**	.0002
Instruction	Whole Language	.0002	.0004						
	Blended	-.0002	.0003						
	D1 KW1W			.003	.002	.003**	.002	.003	.002
	D2 KW1P			.00001	.0007	.00001	.0007	.00001	.0007
	D3 KW1B			-.0005	.0006	-.0005	.0006	-.0005	.0006
	D4 KP1W			-.001*	.0004	-.001*	.0004	-.001	.0004
	D5 KP1B			.00001	.0004	.00001	.0004	.00001	.0004
	D6KB1W			-.0009	.0005	-.001	.0005	-.001	.0005
	D7KB1P			-.001	.0005	-.001	.0005	-.001	.0005
	D8KB1B			-.0001	.0004	-.001	.0005	-.0001	.0004
Reference Group		White male students that speak English at home with average SES and average ability that received phonics instruction		White male students that speak English at home with average SES and average ability that received phonics instruction on both kindergarten and first grade					

* p<.01 ** p<.001

CHAPTER 5

SUMMARY, LIMITATIONS, DISCUSSION, AND IMPLICATIONS

This chapter presents five sections. The first section summarizes the purpose of the study, the research questions, the methodology, and the main findings of the study. The second section describes the main limitations of the study. The third section discusses the findings of the study in relation to the research literature. The final two sections present the implications for research and the implications for practices.

Summary of the Study

The effectiveness of both approaches has been discussed in various studies (Bergin & LaFave, 1998; Isbell, Sobol, Jo, Lindauer, & Lowrance, 2004; Jalongo et al., 2004; Morris et al., 1995; Richgels, 1995; Stahl et al., 1993; Stahl & Miller, 1989; Turner, 1995; Xue & Meisel, 2004). In response to Chall (1989) and Adam's (1994) critique of reading research, longitudinal studies on reading development were conducted. For example, Roberts and Mering (2006) found that students who learned to read through decoding in first grade had higher fifth-grade reading comprehension scores than students who learned to read through literature and that students with learning disabilities or in the low-SES group particularly benefitted from phonics instruction.

In addition, several recent reading studies used the Early Childhood Longitudinal Study, Kindergarten Class of 1998-99 (ECLS-K) to First Grade dataset to examine the effectiveness of phonics and whole language approaches to reading. Even though the ECLS-K is a large-scale survey and not a field experiment, this dataset possesses a number of desirable features. For example, Xue and Meisel (2004) investigated the effects of different reading instruction methods on kindergarten students. The researchers found that kindergarten

students who received whole language instruction performed better than those who received phonics instruction. Chatterji (2006) found that students' first-grade reading achievement correlated with students' poverty level, school level, class size, and elementary teacher certification rate.

Although these studies used the ECLS dataset to investigate the effectiveness of reading instruction on the same group of students, the studies did not follow the students to fifth grade. Therefore, the general purpose of this study was to to investigate the effect of different types of reading instruction on students' reading achievement from kindergarten to fifth grade using the ECLS-K data. In addition, several issues raised by these studies were addressed. First, the interpretation of an ECLS-K reading study hinges on the methodology used to define the types of the reading instruction. This study reexamines Xue and Meisel's measurement of reading instruction by using factor analysis and cluster analysis on the Kindergarten and First-Grade Teachers' Questionnaires. Second, the study uses the longitudinal data to investigate the growth of students'reading achievement according to the students' reading instruction in kindergarten and first grade, and the study examines various characteristics of the students, including gender, ethnicity, home language, socioeconomic status, and ability measure (kindergarten general knowledge score).

. Teachers' responses to the reading activity items from in the kindergarten and first-grade teachers' surveys are analyzed and used to define four types of reading instruction: decoding, reading with controlled vocabularies, reading with meaningful text and activities, and blended. The activities of Reading with Meaningful Text and Activity instruction group included inventive spelling practice, working with meaningful text, developing reading comprehension skills, and reading child literature. The activities of the Decoding

Instruction group included learning letter names, decoding, taking dictation, and reading with controlled vocabularies. The blended instruction group incorporated all phonics and whole language instruction activities. Furthermore, the author investigated the effect of reading instruction on students with different characteristics and general knowledge abilities.

The data of the study is derived from the five waves of the ECLS-K. The datawas sponsored and wwas collected by the NCES. The base year includes a nationally representative sample of 21,260 kindergarten students in 1,280 schools. Base-year data was collected in the fall of 1998 and the spring of 1999. An additional four waves were collected in the fall and spring semesters of first grade, and the spring semester for third and fifth grades. After applying the recommended weight, the final sample size of the study was 9,796 with 3,509 kindergarten teachers and 2,967 first-grade teachers. Students who did not have any reading IRT (n = 7) were deleted; the remaining missing data at the student and teacher levels were imputed using the EM algorithm from SPSS.

A quadratic growth model is implemented to examine students' reading achievement growth from kindergarten to fifth grade. Predictors including various backgrounds, control and instructional variables are included. Because students were not assessed in the same month of the school year, time variables were converted to the month to better capture students' monthly reading growth. The value of the first month of the fall semester of kindergarten (September 1998) was set to zero. The value of the last month of fifth grade (June 2004) was 69. Four hierarchical linear modeling (HLM) growth models, centered on the spring semester of kindergarten, the semester spring of first grade, the spring semester of third grade, and the spring semester of fifth grade, were estimated.

To define the reading instruction using the teacher's survey questions, all reading activity items were included in the factor analysis. Four factors were identified in the Kindergarten Teachers Questionnaire. Four factors were identified in the First-Grade Teachers Questionnaire. Cluster analyses were used to identify the pattern of whole language, phonics, and blended instruction practices. In both kindergarten and first grade, three types of reading instruction practice patterns were identified in each grade: phonics, whole language instruction, and blended. Nine different combined reading groups (Table 3.8) were defined for the HLM analysis.

Quadratic growth models are tested to estimate the students' reading scores in the spring semester of first grade, third grade, and fifth grade. Because reading growth is known not to be a linear process (MaCoach et al., 2006) and the effect of reading instruction lessens as students progress to later grades, the intercept and curvature for the spring semester of first, third, and fifth grade are estimated. The variance explained by each model is identified. Students' gender, ethnicity, SES, and ability explain more than 40% of the variance. Kindergarten and first grade instruction together explained only about 1% of the variance.

Level 1 variables includes students' reading achievement IRT score, a time variable, and its square that was centered at the end of the school year. The level 1 model is

$$Y = \beta_0 + \beta_1*(\text{Time}) + \beta_2 (\text{Time})^2 + \mu$$

Level 2 variables includes student background variables (gender and ethnicity), control variables (SES, home language, and ability), and instruction variables (KP1W, KP1B, KW1P, KW1W, and KW1B). Because ability and SES do not have a meaningful zero value, they are centered on the grand mean for all analyses. The final level 2 model is:

$\beta_0 = G_{00} + G_{01}*(\text{Gender}) + G_{02}*(\text{Black}) + G_{03}*(\text{Hispanic}) + G_{04}*(\text{Asian}) + G_{05}*(\text{Other}) + G_{06}*(\text{Home Language}) + G_{07}*(\text{SES}) + G_{08}*(\text{Ability}) + G_{09}*(\text{KP1W}) + G_{010}*(\text{KP1B}) + G_{011}*(\text{KW1P}) + G_{012}*(\text{KW1W}) + G_{013}*(\text{KW1B}) + G_{014}*(\text{KB1P}) + G_{015}*(\text{KB1W}) + G_{016}*(\text{KB1B}) + U_{00}$

$\beta_1 = = G_{10} + G_{11}*(\text{Gender}) + G_{12}*(\text{Black}) + G_{13}*(\text{Hispanic}) + G_{14}*(\text{Asian}) + G_{15}*(\text{Other}) + G_{16}*(\text{Home Language}) + G_{17}*(\text{SES}) + G_{18}*(\text{Ability}) + G_{19}*(\text{KP1W}) + G_{110}*(\text{KP1B}) + G_{111}*(\text{KW1P}) + G_{112}*(\text{KW1W}) + G_{113}*(\text{KW1B}) + G_{114}*(\text{KB1P}) + G_{115}*(\text{KB1W}) + G_{116}*(\text{KB1B}) + U_{10}$

$\beta_2 = = G_{20} + G_{21}*(\text{Gender}) + G_{22}*(\text{Black}) + G_{23}*(\text{Hispanic}) + G_{24}*(\text{Asian}) + G_{25}*(\text{Other}) + G_{26}*(\text{Home Language}) + G_{27}*(\text{SES}) + G_{28}*(\text{Ability}) + G_{29}*(\text{KP1W}) + G_{210}*(\text{KP1B}) + G_{211}*(\text{KW1P}) + G_{212}*(\text{KW1W}) + G_{213}*(\text{KW1B}) + G_{214}*(\text{KB1P}) + G_{215}*(\text{KB1W}) + G_{216}*(\text{KB1B})$

Research Questions

Two research questions are addressed: (a) What type of instruction was provided to the kindergarten and first-grade students based on the ECLS-K Kindergarten and First-grade Teacher Questionnaire?(b) What is the relationship between the types of reading instruction and reading achievement and growth in kindergarten first, third, and fifth grade? (c) Does the type of reading instruction students received in kindergarten and first grade influence reading achievement in the third and fifth grades?

Research Question One

To define the types of reading instruction, principal component analyses with varimax rotation were completed on both kindergarten and first-grade

teacher survey items. Factor loadings of all instructional practice items for kindergarteners identified seven items defining a phonics decoding practices component, six items defining a reading comprehension instruction, 10 items defining a concept of prints construct, and eight items defining a whole language component. Final analysis of the patterns of teachers' instructional practice controls for comprehension items because the purpose of the current study is to compare the effectiveness of reading with whole language and phonics activities.

Factor analyses of items measuring instructional practices at the first-grade level identifies 13 items as the whole language instruction component, nine items as the comprehension component, seven items as the phonics decoding component, and eight items that are phonics instruction with a control vocabulary text component.

Three two-step likelihood cluster analyses were identified for kindergarten and first-grade reading instruction (Tables 4.7 and 4.8). One cluster is identified as whole language instruction with meaning-making activities. In this group, teachers' instruction focused on incorporating meaningful text into reading activities. The frequency of working on inventive spelling is very high for this group of teachers. This group of teachers did not incorporate any decoding activities. In addition, teachers who incorporated more meaningful activities in their classrooms tended to use fewer comprehension activities compared to decoding or blended vocabulary. This trend might be caused by the fact that working on these meaningful activities is more time-consuming than working on decoding or reading controlled vocabulary texts. Therefore, with limited class time, teachers were not able to incorporate training for other reading skills such as comprehension or the introduction of print concepts.

The second cluster is identified as instruction practice focused on building students' decoding skills. The main reading activities of the teachers in this group are decoding and introducing the concept of print. Teachers who focused on decoding and reading with controlled vocabularies spent similar amounts of time on reading comprehension skill training compared to the blended instruction group.

The third cluster was identified as blended instruction. Teachers in this group distributed their classroom activities evenly in reading through meaningful text, introducing the print concept, and decoding training.

In kindergarten, 18.95% of teachers focused their reading instruction on using meaningful activities and text, 52.30% of teachers focused on using decoding activities, and 28.75% of teachers used both decoding and meaningful activities. In the first grade, 17.38% of teachers used meaningful text and activities, 26.05% of teachers used decoding and reading with controlled vocabulary activities, and 56.57% of teachers used both decoding and meaningful activities in their reading classrooms.

The cluster analysis identifies the trend toward blended instruction between the years of 1998 to 2000. Whole language instruction that did not incorporate decoding activities was not widely implemented in the United States. Teachers who practice phonics instruction included comprehension and reading controlled text in their instructional activities.

Research Question Two

The second research question asks whether the achievement and growth rates are the same for students who have two years of phonics instruction, two years of whole language instruction, or one year of both (mixed instruction). Four

two--level HLM models, with time as the first-level predictors and background, control, and instruction variables as second-level predictors, are developed.

In terms of end-of-year reading achievement scores and growth rates, the four HLM models estimate similar results. Girls has higher average beginning reading scores when they started kindergarten and has higher reading growth rates than boys. In addition, controlling for other variables, Asian students has higher average end-of-kindergarten reading scores and higher reading growth rates among all races across all time periods. Students who had received phonics instruction in kindergarten performs less well than students who had received whole language and blended reading instruction.

The greater the students' ability and the higher the socioeconomic status (SES) of the student, the higher the average reading score and growth rate are at the end of each grade. Further, SES and ability playsignificant roles in minority students' (African American, Asian, Hispanic, and students of other races) and non-English-speaking students' reading achievement growth. When the scores are controlled for SES and ability, students who did not speak English at home outperform students who spoke English at home, throughout all grades.

Finally, students who were exposed to phonics instruction in kindergarten and first grade (KP1P) have higher average beginning scores and higher reading growth rates than students who were exposed to phonics in kindergarten and whole language in first grade (KP1W), and phonics instruction in kindergarten and blended instruction in the first-grade (KB1P) groups. Students who received blended instruction in kindergarten and phonics instruction in first grade (KB1P) have significantly higher scores than all other instructional groups. The effect of reading instruction, however, diminishes at the end of the spring semester of third grade. The curvature or acceleration rate explains the diminishing effect.

The effect of instruction on the rate of growth stays the same throughout all grades.

This study suggests that with an appropriate measure of instruction and the implementation of control variables, different types of reading instruction have different effects on students' reading achievement scores and growth. Reading instruction in kindergarten and first grade is a significant predictor for students' reading achievement in later grades. In addition, even though all nine types of reading instruction impact growth rate differently, the reading achievement growth rate, however, stays the same from first grade to fifth grade. Students who received whole language instruction in kindergarten and blended instruction in first grade (KW1B) have significant lower reading growth rates than students who received phonics instruction in both kindergarten and first grade (KP1P). The overall findings of the current study agree with Chall's (1983) argument that if students do not receive appropriate reading instruction in earlier grades, the students are more likely to suffer from reading deficits in later grades.

Limitations

Similar to Xue and Meisel's (2004) study, the results of the current study hinges on the definition of reading instruction. The definition of reading instruction of the current study is limited to items in the ECLS kindergarten and first-grade teachers' surveys. In addition, the survey was conducted in 1998. Reading instruction has changed over the last 10 years. Reading teachers have incorporated whole language activities and phonics activities in their classrooms. For future studies not using ECLS, the definitions of the types of reading instruction will need to be carefully considered to investigate the effect of reading instruction.

Second, students' reading development is a complicated process. Many predictors such as students' home environment, teachers' qualifications, and demographics play important roles in the process. The study investigated only basic demographics of students without investigating students' home environments and teachers' qualifications. Even though about 50% of the between-student variance was explained in the study, students' at-home activities such as reading bedtime stories and visiting libraries with parents should be accounted for to examine all influences on students' literacy development. Further research on such relationships is also recommended.

Finally, because the purpose of the study is to compare the effects of types of reading instruction on students' reading development, comprehension items were not accounted for when defining reading instruction. Once students master basic reading skills, their ability to comprehend the text determines their reading achievement scores. Without a well-trained comprehension strategy, regardless how skillful students' decoding skills are, students might still suffer in later grades. Therefore, future research on different types of reading instruction combined with comprehension skill training is recommended.

Discussion

Both phonics and whole language instruction aim at developing students' word recognition skills that lead to better comprehension in later grades. Phonics instruction focuses on systematic, sequenced direct instruction. Phonics separates reading development into decoding a printed word and comprehending the meaning of the printed word (Xue & Meisel, 2004).Thus, the phonics instructional approach focuses reading instruction in kindergarten and first grade on building students' basic reading skills such as understanding the relationship between sound and words and decoding. The better students' decoding skills are,

the better their word recognition skills become. On the other hand, whole-language instruction emphasizes using the meaning-making context and activities to facilitate students'natural literacy development (Chall, 1992). Students' reading skill should be developed through meaningful context rather than through pieces of a large context. Reading instruction should emphasize exposing students to a literacy-rich environment. The more students read, the more word recognition skills they develop. Blended instruction attempts to incorporate systematic direct instruction into real-life experience contexts. According to the findings in this study, students benefit from both approaches.

The findings of this research are described based on author-defined reading constructs. Findings from factor analyses and cluster analyses have defined reading instruction that used meaning-making activities as the whole language approach, while decoding and reading with controlled vocabularies are defined as the phonics approach. Therefore, in this discussion, whole language instruction refers to instruction that uses both meaning-making and student-centered activities. Phonics instruction refers to instruction that uses decoding and reading with controlled vocabularies. These definitions of reading instruction are similar to those used by Xue and Meisel (2004). The kindergarten and first-grade teacher questionnaires, however, provided indicators for the reading instruction trend between the years 1998 and 2000. Reading instruction during those years focused on balanced reading instruction.

The effect of reading instruction can be offset by students' ability before kindergarten (Kaplan & Walpole, 2005). The resultsof the current study suggested, after controlling for SES and ability, that the gap between Caucasian and African American and Hispanic students appeared to be narrowed. African American students' reading scores, however, were significantly lower over the

grades, and the gap between African American students and Caucasian students widened even after controlling for SES and ability. Regardless of race, students with higher SES have more resources and access to reading material at home and at school. These students are constantly exposed to a richly literate environment. Therefore, their reading achievement scores and growth rates are higher than those of students from lower-SES communities. Low-SES students suffer from lacking of resources, which slows down their growth rate. Thus, the reading achievement gap widens as students progress to higher grades. Therefore, providing low-SES schools with the rich literature resources that higher SES schools have might close the reading achievement gap between students in different SES groups.

In addition, previous research (Stahl & Miller, 1989; Xue & Meisel, 2004) argued that whole language instruction is more effective for kindergarten students' reading achievement. In support of this argument, the findings of the current study suggest that by the end of the spring semester of kindergarten, students who were exposed to whole language instruction and blended instruction in kindergarten (KW) had higher average reading achievement scores than students who were exposed to phonics instruction (KP) in kindergarten. Furthermore, Xue and Meisel (2004) argued that students in the blended reading instruction group had higher reading achievement scores at the end of kindergarten. The results of the current study suggest that students who received blended instruction had higher reading achievement scores than students who received whole language instruction. Students do not benefit from phonics or whole language instruction alone. For students to achieve higher reading achievement scores in later grades, students need to be systematically trained with different reading skill sets.

Decoding is essential for developing students' word recognition skills which is required to comprehend texts (Pressley, 2006) If students are not able to automatically decode words in contexts, students have to spend more cognitive processing load recognizing the words, and thus have less cognitive space for comprehension. Therefore, instead of arguing whether phonics instruction is better than whole language instruction or vice versa, it is more important to understand how each instructional approach can complement each other's disadvantage and ultimately benefit students' learning.

Whole language instruction, however, appears to have an advantage for kindergarten students. Stahl and Miller (1989) suggested that whole language instruction motivates students to read and students who received whole language instruction in kindergarten have higher reading achievement scores at the end of kindergarten than students received phonics instruction. The findings of the current study support Stahl and Millers argument. Students who received whole language instruction in kindergarten scores higher than students who received phonics instruction. Compared with the blended instruction group, however, the whole language instruction group has lower achievement scores at the end of kindergarten

Xue and Meisel (2004) suggested that the more reading instruction time spent in the classroom, the higher students' reading achievement. Whole language instructional activities, such as using play or skits or peer tutoring, are time-consuming to prepare and require additional resources such as storybooks and props. As a result, teachers lose instructional time in classroom. In addition, teachers in classrooms that have limited resources are at a disadvantage if they use the whole language instructional approach. On the other hand, phonics instruction is more direct-instruction oriented and requires fewer additional

resources. Teachers are able to spend more time in instruction. In addition, Chall's (1993) literacy development theory suggested that students need to have solid print concept and decoding skills at an early age before they progress toward the next stage. The findings of the study suggests that the blended and phonics instruction group spent most of their time introducing the print concept to students and teaching students decoding skills. As a result, students who received phonics instruction in kindergarten and first grade (KP1P) scored higher than students who received whole language instruction in kindergarten and first grade (KW1W). Therefore, students benefit from phonics instruction.

Changing instructional methodologies can be challenging for students. Chall (1993) argued that once students have developed a certain way of processing print, it is difficult for them to change to an alternative method. The students in the KP1W and KP1B group faced the change from one methodology to another or one methodology to the blended one that incorporated another methodology. The result suggests that students face difficulties when switching from one to another. Therefore, students' reading achievement scores were significant lower than the group that received phonics in both grades (KP1P). On the other hand, students who were used to both phonics and whole language instruction in kindergarten (blended) appears to have no difficulties in switching to either reading instruction type.

Blended instruction not only provides teachers with the best of each approach and more instructional time but also exposes students to various instructional types to prepare the students for change. In the current study, students in the KB1P and KB1W group appear to have higher reading scores at the end of first grade. Students in the blended group learned to read with instruction that incorporated phonics and whole language instruction; they

appears to have few difficulties adjusting to the new methodology. Furthermore, students who received whole language instruction in kindergarten and received phonics instruction in first grade (KW1P) appear to have few difficulties and scored higher than the KP1P group. This finding suggests that if students are motivated to read in kindergarten, they might have less difficulty in adjusting to other reading instruction types.

In addition, the effect of reading instruction on students' growth rate was consistent from the end of first grade to the end of fifth grade. Students who received whole language instruction in kindergarten had a lower growth rate over the years than students who received phonics or blended instruction in kindergarten. Again, the finding suggests that for students who do not receive the required reading skills before their academic progression, their probability of success in reading decreases regardless of their reading achievement scores at the end of kindergarten. Less skilled readers, however, use methods to compensate.

Perfetti et al. (1979) and Stanovich et al. (1981) suggested that less skilled readers tend to use context to identify the meaning of words more than skilled readers, even though skilled readers are more efficient at doing so. The findings of the current study agree with this argument. Students who received blended instruction had the experience of working with components of words (decoding) along with the experience of working with literature as a whole. Therefore, students who received the blended combination of instructions (KB1P, KB1W, and KW1P) outperformed the groups of students who received single reading instruction alone. Furthermore, students who received blended instruction in kindergarten and were exposed to rich literacy environments with both controlled vocabularies in first grade significantly outperformed the other groups of students

at the end of the spring semester of third grade. Again, this finding confirms Chall's (1993) reading development stage theory that successful reading development depends on the skills that were built in the early school years. Even though the effect wears off in later grades, without a solid foundation, students will face difficulties in later grades. In addition, the current study's finding suggests that it is important to expose students to both phonics and whole language instruction in kindergarten to prevent further difficulties students might face if they are assigned to teachers with different reading instruction approaches.

According to the research, of the different approaches, phonics instructions seems to be more effective than whole language instruction. The report from the National Reading Panel (2001) indicated that phonics instruction that included phonemic awareness, phonics, fluency, vocabulary, and comprehension was effective in teaching students to read, as skilled readers possess not only decoding skills but are also fluent readers with strong word recognition skills. A solid foundation of decoding skills needs to accompany frequently reading text as a whole (Chall, 1983). Direct instruction of phonics decoding skills advances students' reading development in later grades. The effect, however, diminishes over time if students are not constantly exposed to a large amount of literature (Ehri, 2001; Goodman, 1998). The findings of this study suggest that blended instruction in kindergarten and whole language instruction in the first-grade group (KB1W) have more positive significant influences on students' fifth-grade reading achievement than other types of instruction. The effect of whole language did not show a significant positive effect until the fifth grade. It is necessary for students to develop sufficient decoding skills in the early grades. Exposure to a rich literacy environment, however, is essential to prepare students for the reading requirements in later grades. Reading

instruction in early grades should focus more on the development of students' basic reading skills through controlled vocabulary context. As students progress to later grades, reading instruction gradually focuses more on developing students' fluency, word recognition, and comprehension skills.

Even though the finding of the current study suggests that students need to have a solid concept of print and decoding skills, students who received reading activities that incorporate literature in the first grade continued to have significantly higher reading achievement scores through the third grade. Students with stronger decoding skills appear to have stronger word recognition skills when they are exposed to literature. Reynher (1997) stated that students who came from "high literacy" households—in which young students are read bedtime stories on a regular basis, in which there are a lot of students's books, and in which adults read regularly—tend to learn to read well. These students tend to enter school with larger vocabularies and greater reading readiness skills. Alternately, Reyhner also contended that students from "low literacy" households are not exposed to much reading in their homes and tend to have smaller vocabularies.

In addition to high-literacy environments, students whose home language is English performed higher across all grades than those who did not speak English at home when SES and ability were not controlled. Chatterji's (2006) longitudinal study suggested that home literacy environments are strong predictors of reading achievement in later grades. The current study's finding supports Chatterji's arugment that the more students are exposed to richly literate environments, the better students perform in reading achievement tests. The effect of students' SES status continues to be a strong predictor of reading achievement as the students progressed to later grades.

In the current study, reading growth rates in all groups are mostly higher for Asian students, after controlling for home language, SES, and ability. Hispanic students had lower growth rates before controlling for other variables. After controlling for home language, SES, and ability, Hispanic and Caucasian students had similar growth rates, but the result was not significant. In addition, Hispanic students showed lower beginning scores at the end of the spring semester of kindergarten than the other races, but had caught up with Caucasian students by the end of the spring semester of first grade, after controlling for instruction variables.

The growth rate of students who came from lower SES backgrounds appeared to be slower than the rates of those who had higher SES backgrounds. The growth rate appeared to be steady from first grade to fifth grade. The results are consistent with Ehri's (1995) argument that without mastery of a particular reading skill, students are unable to master the next reading skill. In the current study, students who did not master the basic reading skills in kindergarten and first grade appeared to struggle after first grade and were not able to catch up with students who had mastered the basic skills. Students who do not learn how to read in their early years tend to have a more difficult time succeeding in school and in their careers. Early intervention could prevent an individual's later reading difficulties (Chhabra & McCardle, 2004). The result of the current study agrees and reinforces the importance of early reading instruction, and suggests that intervention in reading skills should be implemented as early as possible to avoid widening the reading gap between students with different ability, SES, and backgrounds.

Overall, these different methods of reading instructions all have roles to play. Cromwell (2007) pointed out, emerging from the conflict over whole

language and phonics, an increasingly widespread view that each approach has a different, but potentially complementary, role to play in the effective teaching of reading. Many educators now look for ways to use phonics as part of whole language instruction, striving to teach decoding skills within the context of literature. She stated that the majority of experts now contend that neither approach by itself is effective all the time, but that both approaches possess merit. She argued that only a carefully designed reading program that employs partly a whole language approach and partly a phonics approach can succeed.

In conclusion, the findings of the current study suggest that a balanced reading instruction approach in kindergarten and first grade not only supports students' reading growth but also provides a strong foundation for students as they progress to later grades. No reading instruction alone benefits students' reading development. Students' reading development in different grades requires instruction that helps them to build certain skills to advance to the next stage. In kindergarten, students need to develop their interest in reading as well as some concepts of print and written English structure. In first grade, students need to develop their skills at recognizing letter-sound relationships, decoding, and comprehending whole literature and re-designed literature with a controlled vocabulary. Decoding training without reading a whole piece of text enables students to recognize words but does not help students to think about the functionality of the words in context. Reading a whole piece of literature enables students to see the words in context, but guessing at the meaning of words in the context increases students' cognitive processing load. This slows students' comprehension process. Therefore, reading development is a continuous process, and students' reading skill should be developed through a systematic structure.

Implications for Research

Even though Chall (1993) argued that students' reading development follows a set of stages, the findings of this current research suggest that students' reading growth slows down. This result might be because the current study do not consider comprehension training a part of reading instruction in kindergarten and first grade. Therefore, a distinct research study that includes comprehension instruction from phonics and whole language instruction, and that investigates these instructions on students' reading achievement over time, is recommended. (Appendix C includes the results of additional analysis that includes comprehension training in kindergarten and first grade.)

Whether the instrument measures what it is intended to measure is the most important point to consider when using the ECLS data set to investigate the consequences of reading instruction. Without an instrument that can define reading instruction, no reading study will provide practical significance to parents, teachers, and policymakers with regard to reading. This study defines a variable for reading instruction that was implemented in kindergarten and first-grade classrooms, and reexamines the reliability of the items that were used to determine teachers' reading instruction in teachers' questionnaires. The findings show that factor analysis alone could not define the complex reading construct. Additional analysis is necessary to identify the reading instructional pattern used by the teachers.

This study extends findings of reading growth from kindergarten to first grade, including the statistically significant and reliable factors established for reading instruction conditions, may provide suggestions for literacy teachers and policymakers when making decisions for implementing reading instructions. Further studies should be conducted to determine the impact of socioeconomic

factors on parents' abilities to prepare their students for school readiness in an effort to improve their future literacy.

Implications for Practice

Students from low-SES communities performed lower than those who came from higher SES. The lack of a literature-rich environment contributed to students' lower reading achievement performance. Even though studies (Ehri, 2001) have suggested that phonics instruction is more effective than whole language instruction for students' reading achievement, the lack of resources for students' exposure to literature might offset the effect of any instruction. Therefore, increasing students's exposure to literature in low-SES communities and schools will not only strengthen the effect of the reading instruction students receive but will also motivate students to read.

Furthermore, the findings suggest that students benefit from early decoding skill training in kindergarten. Students who received some whole language instruction in those two years actually had significant higher scores than those who received decoding instruction only. The benefit of these reading instruction activities is not only short-term but persists into the long-term until the third grade. Therefore, incorporating activities identified in this study in the classroom teaching methods could benefit students' reading development.

In conclusion, while the debate over phonics and whole language may continue, the author does not intend to advocate either approach. A major finding of the study indicates that students' reading development is not linear. Reading instruction should start with the print concept and decoding skill training and gradually include literature as a part of decoding activities. Incorporating engaging reading activities in a reading classroom, which can help accommodate students with different backgrounds and abilities, will not only benefit students'

reading achievement and close the reading gap but also develop students' lifelong interest in reading.

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APPENDIX A

SPRING KINDERGARTEN TEACHER QUESTIONNAIRE INSTRUCTIONAL ACTIVITIES AND CURRICULAR FOCUS ITEMS

28. How often do children in this class do each of the following **READING and LANGUAGE ARTS** activities? CIRCLE ONE NUMBER ON EACH LINE.

	Never	Once a month or less	Two or three times a month	Once or twice a week	Three or four times a week	Daily
a. Work on learning the names of the letters	1	2	3	4	5	6
b. Practice writing the letters of the alphabet	1	2	3	4	5	6
c. Discuss new or difficult vocabulary	1	2	3	4	5	6
d. Dictate stories to a teacher, aide, or volunteer	1	2	3	4	5	6
e. Work on phonics	1	2	3	4	5	6
f. Listen to you read stories where they see the print (e.g., Big Books)	1	2	3	4	5	6
g. Listen to you read stories but they don't see the print	1	2	3	4	5	6
h. Retell stories	1	2	3	4	5	6
i. Read aloud	1	2	3	4	5	6
j. Read from basal reading texts	1	2	3	4	5	6
k. Read silently	1	2	3	4	5	6
l. Work in a reading workbook or on a worksheet	1	2	3	4	5	6
m. Write words from dictation, to improve spelling	1	2	3	4	5	6
n. Write with encouragement to use invented spellings, if needed	1	2	3	4	5	6
o. Read books they have chosen for themselves	1	2	3	4	5	6
p. Compose and write stories or reports	1	2	3	4	5	6
q. Do an activity or project related to a book or story	1	2	3	4	5	6
r. Publish their own writing	1	2	3	4	5	6
s. Perform plays and skits	1	2	3	4	5	6
t. Write stories in a journal	1	2	3	4	5	6

	Never	Once a month or less	Two or three times a month	Once or twice a week	Three or four times a week	Daily
u. See/hear stories from story tellers or other artists	1	2	3	4	5	6
v. Work in mixed-achievement groups on language arts activities	1	2	3	4	5	6
w. Peer tutoring	1	2	3	4	5	6

29. For this school year as a whole, please indicate how each of the following **READING** and **LANGUAGE ARTS** skills is taught in your class(es)? CIRCLE ONE NUMBER ON EACH LINE.

	Not Taught		Taught				
	Taught at a higher grade level	**Children should already know**	**One a month or less**	**2-3 times a month**	**1-2 times a week**	**3-4 times a week**	**Daily**
a. Conventions of print (left to right orientation, book holding)	1	2	3	4	5	6	7
b. Alphabet and letter recognition	1	2	3	4	5	6	7
c. Matching letters to sounds	1	2	3	4	5	6	7
d. Writing own name (first and last)	1	2	3	4	5	6	7
e. Rhyming words and word families	1	2	3	4	5	6	7
f. Reading multi-syllable words, like adventure	1	2	3	4	5	6	7
g. Common prepositions such as over and under, up and down	1	2	3	4	5	6	7
h. Identifying the main idea and parts of a story	1	2	3	4	5	6	7
i. Making predictions based on text	1	2	3	4	5	6	7
j. Using context cues for comprehension	1	2	3	4	5	6	7
k. Communicating complete ideas orally	1	2	3	4	5	6	7
l. Remembering and following directions that include a series of actions	1	2	3	4	5	6	7
m. Using capitalization and punctuation	1	2	3	4	5	6	7
n. Composing and writing complete sentences	1	2	3	4	5	6	7
o. Composing and writing stories with an understandable beginning, middle, and end	1	2	3	4	5	6	7
p. Conventional spelling	1	2	3	4	5	6	7

	Not Taught		Taught				
	Taught at a higher grade level	Children should already know	One a month or less	2-3 times a month	1-2 times a week	3-4 times a week	Daily
q. Vocabulary	1	2	3	4	5	6	7
r. Alphabetizing	1	2	3	4	5	6	7
s. Reading aloud fluently	1	2	3	4	5	6	7

30. To what extent do you agree with the following statement? "Children should be encouraged to use invented spelling if they do not know the correct spelling of a word." CIRCLE ONE NUMBER.

Strongly disagree	1
Disagree	2
Neither agree nor disagree	3
Agree	4
Strongly agree	5

APPENDIX B

SPRING FIRST GRADE TEACHER QUESTIONNAIRE INSTRUCTIONAL ACTIVITIES AND CURRICULAR FOCUS ITEMS

48. How often do children in this class do each of the following **READING and LANGUAGE ARTS** activities? CIRCLE ONE NUMBER ON EACH LINE.

	Never	Once a month or less	Two or three times a month	Once or twice a week	Three or four times a week	Daily
a. Work on learning the names of the letters	1	2	3	4	5	6
b. Practice writing the letters of the alphabet	1	2	3	4	5	6
c. Discuss new or difficult vocabulary	1	2	3	4	5	6
d. Dictate stories to a teacher, aide, or volunteer	1	2	3	4	5	6
e. Work on phonics	1	2	3	4	5	6
f. Listen to you read stories where they see the print (e.g., Big Books)	1	2	3	4	5	6
g. Listen to you read stories but they don't see the print	1	2	3	4	5	6
h. Retell stories	1	2	3	4	5	6
i. Read aloud	1	2	3	4	5	6
j. Read from basal reading texts	1	2	3	4	5	6
k. Read silently	1	2	3	4	5	6
l. Work in a reading workbook or on a worksheet	1	2	3	4	5	6
m. Write words from dictation, to improve spelling	1	2	3	4	5	6
n. Write with encouragement to use invented spellings, if needed	1	2	3	4	5	6
o. Read books they have chosen for themselves	1	2	3	4	5	6
p. Compose and write stories or reports	1	2	3	4	5	6
q. Do an activity or project related to a book or story	1	2	3	4	5	6
r. Publish their own writing	1	2	3	4	5	6
s. Perform plays and skits	1	2	3	4	5	6
t. Write stories in a journal	1	2	3	4	5	6

	Never	Once a month or less	Two or three times a month	Once or twice a week	Three or four times a week	Daily
u. See/hear stories from story tellers or other artists	1	2	3	4	5	6
v. Work in mixed-achievement groups on language arts activities	1	2	3	4	5	6
w. Peer tutoring	1	2	3	4	5	6

49. For this school year as a whole, please indicate how each of the following **READING** and **LANGUAGE ARTS** skills is taught in your class(es)? CIRCLE ONE NUMBER ON EACH LINE.

	Not Taught		Taught				
	Taught at a higher grade level	Children should already know	One a month or less	2-3 times a month	1-2 times a week	3-4 times a week	Daily
a. Conventions of print (left to right orientation, book holding)	1	2	3	4	5	6	7
b. Alphabet and letter recognition	1	2	3	4	5	6	7
c. Matching letters to sounds	1	2	3	4	5	6	7
d. Writing own name (first and last)	1	2	3	4	5	6	7
e. Rhyming words and word families	1	2	3	4	5	6	7
f. Reading multi-syllable words, like adventure	1	2	3	4	5	6	7
g. Common prepositions such as over and under, up and down	1	2	3	4	5	6	7
h. Identifying the main idea and parts of a story	1	2	3	4	5	6	7
i. Making predictions based on text	1	2	3	4	5	6	7
j. Using context cues for comprehension	1	2	3	4	5	6	7
k. Communicating complete ideas orally	1	2	3	4	5	6	7
l. Remembering and following directions that include a series of actions	1	2	3	4	5	6	7
m. Using capitalization and punctuation	1	2	3	4	5	6	7
n. Composing and writing complete sentences	1	2	3	4	5	6	7
o. Composing and writing stories with an understandable beginning, middle, and end	1	2	3	4	5	6	7
p. Conventional spelling	1	2	3	4	5	6	7

	Not Taught		Taught				
	Taught at a higher grade level	Children should already know	One a month or less	2-3 times a month	1-2 times a week	3-4 times a week	Daily
q. Vocabulary	1	2	3	4	5	6	7
r. Alphabetizing	1	2	3	4	5	6	7
s. Reading aloud fluently	1	2	3	4	5	6	7

50. To what extent do you agree with the following statement? "Children should be encouraged to use invented spelling if they do not know the correct spelling of a word." CIRCLE ONE NUMBER.

Strongly disagree	1
Disagree	2
Neither agree nor disagree	3
Agree	4
Strongly agree	5