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Running head: TEACHERS' KNOWLEDGE OF ENGLISH PHONOLOGY

Teachers' Knowledge of English Phonology and Attitudes toward Reading Instruction as Related
to Student Outcomes

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Abstract

The purpose of this study was to determine if teachers' knowledge of English phonology and attitudes toward explicit and implicit reading instruction were related to student growth in reading. First-grade teachers completed a knowledge assessment and attitudes survey, and their students were administered reading measures in the spring of kindergarten and first grade. The data were analyzed to determine relationships between teacher variables and student achievement. Moderate correlations emerged between teachers' knowledge, attitudes toward explicit instruction, and student achievement, but there were no significant correlations between these teacher variables and student reading growth. Teachers with higher levels of knowledge were found to have more positive attitudes regarding explicit instruction, and higher performance on kindergarten reading measures was related to higher performance on first-grade reading measures.

CHAPTER ONE

Statement of the Problem

The United States spends more money on education than any other country in the world (Sweet, 1996); despite this, there are 42 million illiterate adults in this country, and 50 million that read below a sixth-grade level (Sweet). Students with reading difficulties at the end of third grade continue to have reading difficulties throughout the remainder of their schooling. In addition, children with reading difficulties are less likely to graduate and more likely to end up in the legal system than are children without such difficulties (Kauerz, 2002). Specifically, 75% of children exhibiting reading difficulties by age 9 continue to have reading problems throughout high school, 10-15% of students with reading problems dropout of high school, and 50% of adolescents with a criminal record or reported substance abuse issues struggle with reading (Lyon, 1998). Such statistics are staggering and convey the importance of literacy in school, as well as in life. Literacy is important in our society, yet there appears to be difficulty in preparing children to become literate adults.

The illiteracy problem often begins with school-aged children failing to read at the expected level. In 1998, the National Association of Educational Progress (NAEP) compiled reports indicating that 40% of fourth-grade students are reading below the basic fourth-grade level, and 17-20% of school-aged children are classified with a reading disability (Lyon, 1998). These statistics signify a need for change in current reading instruction practices.

The "Matthew Effect" in Reading

Children reading below the expected level often continue to fall further behind their peers as they progress through school (McNamara, Scissons, & Dahleu, 2005; Foster & Miller, 2007). A reading discrepancy between at-risk kindergarten readers and their low-risk counterparts was

found to increase as they progressed through first grade (McNamara et al.). Likewise, students who scored significantly below the mean on a literacy assessment in the fall of kindergarten were found to be achieving significantly lower on decoding tasks from kindergarten to third grade than their peers who had performed at or above the mean. By the end of third grade, this decoding gap decreased; however, a comprehension gap emerged, indicating that despite their gains, the students who initially scored below the mean continued to perform below their peers (Foster & Miller).

A possible reason for these increased discrepancies across time may be that good readers read often, and how often children read is largely based on their initial reading success and their reading motivation (Stanovich, 1986). Struggling readers do not read often because of their difficulty in attaining the necessary skills, and the repeated failures they have received as feedback (Morgan & Fuchs, 2007). As good readers continue to read and hone their skills, poor readers do not, widening the performance discrepancy, and leading to long-term reading difficulties.

The significant gaps at the end of first grade between good and poor readers were found to exist between different sub-groups of children (Chatterji, 2006). Chatterji found that children from low poverty households performed significantly better on a reading assessment than children from high poverty households. Caucasian children performed significantly better than African American children, and girls performed significantly better than boys on the same measure (Chatterji).

Reading performance not only affects academics; it can have a critical impact on self-image (Chapman & Tunmer, 2003). Poor readers view themselves as less competent in reading, leading to a negative self-concept in reading and possibly an overarching negative academic self-

concept (Chapman & Tunmer). As reading difficulties persist, the outcomes become more severe. Students with poor reading ability evidenced a significantly higher rate of suicide attempts and suicide ideation, as well as higher rates of school dropout, than their peers with typical reading ability (Daniel, Walsh, Goldston, Arnold, Reboussin, et al., 2006). Reading programs are needed to address and reduce these achievement gaps, so all children can read at grade level. With such progress children will hopefully enjoy improved academic, as well as personal, outcomes.

Approaches to Reading Instruction

As we understand the reality of achievement gaps and the negative results that such gaps can create, we must examine how students are being taught to read. Three common approaches will be addressed: the explicit approach, the implicit approach, and the balanced approach (Foorman, Francis, Fletcher, Schatschneider, & Mehta, 1998; Fitzgerald & Cunningham, 2002). The explicit approach views reading as a process that must be taught and learned, and therefore includes the systematic instruction of prereading, as well as reading skills, including phonemic awareness and phonics. These skills are used to break words down into smaller units to learn to read. Phonemic awareness deals with the identification and manipulation of individual speech sounds, and phonics deals with letter-sound correspondence (National Reading Panel [NRP], 2000a). The explicit approach often involves the use of scripted lessons to teach skills in a specific sequence. After a skill is learned, activities based on these skills are presented, giving students the opportunity to practice and receive immediate corrective feedback. With this approach, students acquire decoding skills by learning the phonics rules and using alliterative and decodable texts (Foorman et al.).

The implicit, or whole language, approach teaches words as whole units, and enables reading skills to be learned within a meaningful context. It includes the incidental learning of reading skills through exposure to authentic texts (Foorman et al., 1998). This type of instruction is more child-managed and focuses on the meaning of print as opposed to the decoding of print. Students learning from this method may be exposed to choral and guided reading, making predictions regarding literature content, and utilizing context clues to aid in the reading of novel words (Foorman et al.)

The balanced, or embedded, approach values concepts from the explicit as well as the implicit approach, and so employs strategies from both. Proponents of this method do not believe that effective reading instruction can be accomplished with any single method. This type of instruction sees word recognition, comprehension and interpretation, and children's feelings toward reading as equally important components of reading instruction. A teacher utilizing this method will likely teach more than one strategy for students to learn a given skill (Fitzgerald & Cunningham, 2002). Most teachers conform to one of these three methods, but some do not believe in any of the above approaches. Some educators believe that all reading instruction should be individualized as students learn to read differently and will benefit from different supports and strategies (Wren, 2001).

The debate over different reading approaches has been longstanding; however, research has tended to support the use of explicit instruction, and has documented its effectiveness. The National Institute of Child Health and Human Development (NICHD) has summarized findings indicating that reading is not the natural process proponents of the implicit approach believe. Instead, reading skills need to be directly taught to children, although the amount of such instruction differs from child to child (Lyon, 1998).

To determine what effective reading programs have encompassed historically, Bond and Dykstra's First-Grade Studies (1967), and Chall's Learning to Read: The Great Debate (1967), were summarized by Chall (1999). She asserts that both publications came to the same conclusion: reading programs that focus on phonics instruction lead to higher reading achievement. The First-Grade Studies further highlighted that effective reading programs needed a strong emphasis on a systematic, or explicit, approach to phonics instruction, and that this would lead to greater reading achievement in first grade (Chall). Since these hallmark studies were published, research findings have continued to link explicit phonics instruction to greater reading achievement.

Big Ideas in Reading

Research has shown that explicit reading instruction can benefit children learning to read, and the National Reading Panel (NRP) convened to review the relevant research concerning the essential components of reading, and to inform educators about what skills should be included in a reading program. Explicit classroom instruction involving phonemic awareness was found to significantly improve reading outcomes, and to be more effective than instruction without phonemic awareness. Specifically, training in phonemic awareness was found to improve students' phonemic awareness, as well as their reading and spelling. Systematic phonics instruction was also found to improve reading development; improving kindergartners' reading and spelling, and first-graders' decoding, comprehension, and spelling (NRP, 2000a).

The NRP concluded that three additional skills were necessary for successful reading development: fluency, vocabulary, and comprehension (NRP, 2000a). These five skills came to be known as the "big ideas" in reading, and echo what others have identified as the necessary components of an effective reading program (Foorman & Torgesen, 2001; Foorman & Moats,

2004). The NICHD also supports the inclusion of these skills in a reading program, but addresses that the mere inclusion of these skills will not guarantee reading success. Instead, these skills need to be integrated in an effective way for students to fully benefit from such instruction (Lyon, 1998).

Legislation

The federal government has taken notice of the nation's dismal reading statistics, as well as the research regarding what constitutes an effective reading program. In an unprecedented action, it became involved with education on a national level by enacting the No Child Left Behind Act (NCLB) in 2001. This legislation aims to increase student academic achievement through increased teacher accountability and mandated annual assessments to determine if students are meeting standards (Kauerz, 2002). Students not meeting standards will be given interventions to bring their achievement up to grade level, so that by 2014 all children will be performing at or above grade level. NCLB acknowledges the pivotal role teachers play in students' achievement and has mandated that all students be taught by highly qualified teachers by 2007. Therefore, NCLB is encouraging increased educator knowledge through professional development on instructional methods that have been shown to be effective (Kauerz). It is thought that with this new knowledge, teachers will become highly qualified, which will translate into greater student achievement.

The importance of reading on overall student academic achievement prompted the need for the Reading First initiative of NCLB, with the objective that students will read by the end of third grade. This initiative is attempting to improve reading instruction throughout the country by supporting the use of research-based approaches to teaching reading, believing that this will result in higher reading achievement (Denton, 2003). Funds are being disbursed to schools that

employ such reading programs. These funds will help schools to accurately screen and identify students with reading difficulties and give additional support to these students. Reading First is also looking to teachers to improve student outcomes, by providing them with professional development to increase and strengthen their knowledge of reading development and successful reading programs (Kauerz, 2002).

Role of Teachers

The current legislation depends on teachers for improved student outcomes because the teaching of these skills lies with them, and their method of implementation will ultimately lead to student reading success. Teachers not only need to be aware of current research findings, they also need to utilize these research-based reading techniques and utilize them within their classrooms if the goal is to ensure student literacy. However, there is a gap between what the research indicates and how reading is actually taught in classrooms. Explanations have been offered as to why this gap may exist. Preservice teachers who have not been taught to integrate personal, practical, and professional knowledge when designing a reading program may over-rely on their personal experiences to inform their practice, and essentially teach how they were taught. After two university courses focusing on research, theory, and practice of implementing reading programs, as well as assessment and instruction of struggling readers, preservice teachers were found to more effectively integrate all sources of information to inform their reading instruction (Duffy & Atkinson, 2001).

Resources teachers use to acquire additional information pertaining to reading instruction offers another potential explanation. Literacy professionals' responses on a questionnaire indicated that they tend to gather more information on reading instruction from practitioner books and journals that provide practical applications of instructional concepts, and professional

newspapers that include classroom activities, than from research journals. Elementary teachers reported that they mostly read magazines to inform their practice, and they tend to read more general education magazines than literacy-specific magazines. Moreover, 60% of elementary teachers reported that within the past year they have “never” read from a research journal (Commeyras & DeGroff, 1998).

Because preservice teachers typically do not acquire knowledge regarding reading instruction, and because once in the field they do not read scholarly journals to keep abreast of reading research, many teachers simply do not possess adequate knowledge of the big ideas in reading to effectively integrate instruction of these skills into their reading programs (Bos, Mather, Dickson, Podhajski, & Chard, 2001; McCutchen, Harry, et al., 2002; Moats, 1994; Troyer & Yopp, 1990). Staff members responsible for educating students about reading concepts have been shown to have little knowledge of such concepts themselves. On an English phonology questionnaire, the majority of preservice and inservice teachers surveyed answered at least one-third of the questions incorrectly (Bos et al.). In a separate study and questionnaire, 65% of the teachers surveyed were not familiar with the concept of phonemic awareness, which research continues to document as a crucial prereading skill (Toyer & Yopp).

Without the knowledge that research provides, teachers' personal philosophies and perceptions of the various approaches to reading instruction may solely dictate their teaching. Teachers who felt more positively about implicit reading instruction were more likely to utilize concepts of whole language within their classrooms, while teachers who felt more positively about explicit reading instruction were more likely to teach concepts of phonological awareness and phonics within their classrooms. Preservice teachers who favored explicit instruction

perceived themselves as more prepared to teach readers of all abilities than pre-service teachers who favored implicit reading instruction (Bos et al., 2001).

Research Questions

Knowing that the nation's students are not performing at the expected level of reading achievement, and that new legislature has been implemented to improve such achievement, the question arises of how educators are teaching students to read. It also becomes clear that teacher variables are paramount to students' reading success. Therefore, this study attempts to quantify the link between teacher variables and student success. The research questions addressed will be:

- (1) Is student reading growth related to teachers' knowledge of English phonology?
- (2) Is student reading growth related to teachers' attitudes regarding explicit and implicit reading instruction?

CHAPTER TWO

Review of the Literature

Producing literate children has become a necessity. Not only does literacy provide a protective factor for children, which can lead to future school and post school success, but it is now mandated by federal legislation. The Reading First initiative of NCLB is designed to get all students reading at grade level by the end of third grade. To achieve this, teachers are being provided with research-based knowledge and skills to inform their instruction, and annual assessments are administered to students to determine their current level of proficiency.

It is largely educators' responsibility to ensure children's reading success. Good readers read often, and to get children to read often, they need to experience reading success (Morgan & Fuchs, 2007). Because children enter school with differing levels of reading readiness, reading needs to be taught using an approach that will maximize the benefit for the most children, so they can all experience that success.

Phonemic Awareness

Phonemic awareness is the first of the five big ideas in reading as outlined by the NRP. Phonemic awareness refers to the knowledge of phonemes, which are individual speech sounds. The English language consists of 41 phonemes. Instruction in the area of phonemic awareness typically consists of the categorizing, blending, segmenting, and deleting of phonemes. The importance of acquiring phonemic awareness has been documented, as it is one of the two best predictors of learning to read within the first two years of reading instruction, and it has been shown to improve skills not only in phonemic awareness, but in reading and spelling (NRP,

2000b). It is important that children understand that the words they hear are composed of separate speech sounds, as this is the fundamental reading skill (Lyon, 1998).

Training in phonemic awareness can help children learn more complex phonological skills. Approximately 75% of children who had received phonemic awareness training were able to accurately distinguish phonemes, whereas only 9% of children without such training were able to do so (O'Connor, Jenkins, & Slocum, 1995). Students trained in the concepts of segmenting and blending phonemes were able to perform well on an overall measure of phonemic awareness ability, demonstrating that a familiarity with these skills may help students to acquire additional, more complex phonemic skills (O'Connor et al.).

Early instruction involving phonemic awareness activities can translate into longer-term reading achievement. Students who were instructed on individual phoneme identity in preschool through the use of pictures performed better than students who were not exposed on reading and spelling measures administered in fifth grade. Students with preschool training were able to spell more irregular words and decode more nonsense words despite the majority of treatment and control students receiving explicit instruction beginning in kindergarten (Byrne, Fielding-Barnsley, & Ashley, 2000).

Phonemic awareness has repeatedly been demonstrated as an important predictor of early reading success. Performance on sound categorization tasks, such as identifying initial, middle, and ending sounds of words, for four- and five-year-old children were found to correlate to their performance on reading and spelling achievement measures up to two years later. Their performance on these phonological also accounted for a significant amount of the variance observed on the achievement measures. This finding remained stable despite controlling for age and IQ (Bradley & Bryant, 1985). Students who learned to effectively segment and blend

phonemes read novel words at a significantly faster rate than students without such skills (Torgesen, Morgan, & Davis, 1992). Scores on a phonemic awareness test that measured segmentation, as well as the identification and substitution of initial consonant sounds, predicted reading achievement on standardized tests in second grade (Snider, 1997). Phonemic awareness instruction was also found to affect reading comprehension in students up to three years after instruction, illustrating that students who receive such training establish a solid core in reading upon which they can build future reading skills (Kozminsky & Kozminsky, 1995).

Phonics

Phonics is the second of the big ideas in reading. Phonics refers to letter-sound correspondence and the use of this knowledge to identify unknown words. Instruction in this area helps children to understand these connections. Different approaches exist to teach phonics, but research tends to support the use of an explicit, systematic approach that teaches the full array of letter-sound correspondences, including consonant blends, short and long vowels, and vowel-consonant digraphs (NRP, 2000b). Phonics instruction builds upon children's knowledge of phonemes as they learn that phonemes correspond to letters that combine to form words (Lyon, 1998).

Instruction in phonics has been shown to improve students' reading outcomes. First-grade students who received instruction in letter-sound correspondence improved their word reading and spelling accuracy at a faster rate than students who did not receive such instruction (Foorman, Francis, Novy, & Liberman, 1991). Students in first-grade classrooms that provided instruction in knowledge of letter sounds and connecting letters to sounds performed significantly higher than students in control classrooms on letter sound knowledge, standardized reading measures, and a standardized spelling measure. Students in treatment classrooms

continued to perform better on measures of real and nonsense word reading at the end of second grade (Blanchman, Tangel, Ball, Black, & McGraw, 1999).

Phonics instruction is particularly beneficial for students at-risk for reading failure. Phonics instruction in first grade helped most at-risk students meet grade level expectations for first and second grades on reading and spelling measures. However, children who learned phonics through systematic, explicit instruction achieved at a faster rate and were often performing above grade level (Brown & Felton, 1990). Students who entered first grade with low literacy skills benefited from thorough phonics instruction in the beginning of the year. With an effective, initial focus on phonics, these students were found to be successful in literature-rich activities for the remainder of the school year (Juel & Minden-Cupp, 2000). With phonics instruction, children learn to decode words fluently, which provides a firm basis for the comprehension of text (Lyon, 1998).

Explicit Instruction

Learning to read is not inherent; children need explicit instruction in specific reading skills to become successful readers (Lyon, 1998). Explicit instruction is the direct teaching of reading skills, typically in a planned, sequential approach. Its critics argue that it takes away from the individuality and skills of the teacher, but research findings continue to support explicit instruction as more beneficial than implicit or balanced instruction, especially for students who are at-risk for reading failure (Foorman & Torgesen, 2001).

First- and second-grade students receiving explicit instruction in phonemic awareness and phonics improve their word reading and word recognition skills at a significantly faster rate than students who received embedded or implicit instruction. This was especially true for students with low initial phonological processing skills (Foorman et al., 1998). Reading programs based

on explicit instruction of skills also benefited at-risk kindergarten students. Specifically, programs including explicit instruction in phonemic awareness through rhyming and identifying phonemes, as well as explicitly teaching the letter-sound correspondence of phonics, were found to be the most effective for this group of students (Meier & Sullivan, 2004).

When provided with explicit instruction, children make larger gains, which has the potential to decrease the gap between students with higher and lower literacy. An explicit phonics program can help children with lower literacy skills make gains and reduce the discrepancy between them and their higher literacy peers (Juel & Minden-Cupp, 2000). First-graders with weak decoding skills were found to make greater gains when exposed to explicit instruction in such skills, than students who received implicit instruction (Connor, Morrison, & Katch, 2004). First- and second-graders who were exposed to explicit instruction in phonemic awareness and phonics for the school year, obtained decoding skills at the 43rd percentile, while students receiving implicit instruction had decoding skills at the 29th percentile (Foorman et al., 1998). Only 6% of students with explicit instruction remained below the 30th percentile of readers nationwide (Foorman & Torgesen, 2001).

If a child is not meeting expectations in reading at the end of third grade, his or her chances of making enough gains to achieve commensurate with peers is unlikely (Kauerz, 2002). For this reason, formal reading instruction should begin as soon as formal schooling begins, in kindergarten. Just as Meier and Sullivan (2004) found a kindergarten reading program to be effective in the short term, Hanson and Farrell (1995) found formal reading instruction in kindergarten to be beneficial to students in the long term, regardless of sex, ethnicity, or socioeconomic status. This follow-up study compared high school seniors who had been exposed to a formal kindergarten reading program to those who had not. Consistent and positive

effects for reading skills and attitudes emerged for students with a formal kindergarten reading experience throughout their schooling (Hanson & Farrell).

Professional Development

The research base has shown that explicit instruction in the areas of phonemic awareness and phonics is critical for early reading success, but a gap continues to exist between research and practice. To address this issue, Moats (1994, 2001) expressed that preservice teachers' understanding and practice of these concepts should be tied to their certification requirements, and professional development should be made available to inservice teachers to disseminate the reading research findings. In 2002, about half of the 50 states encouraged the use of research-based instruction, but the actual application of such strategies throughout the state's districts and schools has typically been sporadic (Kauerz, 2002). The federal government, along with supporters of the new educational legislature, would like the use of research-based instruction to become universal (Kauerz). The Reading First initiative is aimed at increasing the use of research-based reading instruction by providing funds for professional development to schools receiving their grants. Professional development is necessary to raise educator knowledge of reading research, and to demonstrate how these findings can be translated into useful and feasible classroom strategies. The federal government realizes that people within the school make the difference, and so they are providing funds to train staff with the hope school personnel will enact the changes involved with this initiative (Denton, 2003).

Ninety-five to 98% of all children can learn to read if given research-based instruction (Moats, 2001). However, not all teachers are aware of these types of instruction, and of those who are aware, not all utilize these techniques. Professional development should be encouraged for all educators. Most educators, including those who have previously participated in trainings

concerning these approaches, still exhibit gaps in their knowledge and could continue to benefit from professional development (Moats & Foorman, 2003; Spear-Swerling, Brucker, & Alfano, 2005). Twenty percent of teachers who had previously taken part in professional development had limited knowledge of phonemic awareness, and only 45% showed partial knowledge of language, and reading development (Moats & Foorman). With additional training, teachers may feel more prepared to teach reading to students of all ability levels (Moats).

Professional development has been accomplished successfully in states that have been given Reading First grants (Denton, 2003). One important requirement is that the entire school faculty be involved with professional development. Because reading is involved in every aspect of school, and because with the new legislature all staff members are accountable for student outcomes, it is imperative that all staff members be included. New skills being taught can be modeled for staff, and teachers given the opportunity to practice these skills. Having an on-site reading specialist has been found to be beneficial, as this person can observe teachers in their classrooms, offer feedback about teachers' execution, and answer practical questions concerning the implementation of these new skills in the classroom. Follow-up trainings should also be planned to prevent regressions to the previous instruction and curriculum (Denton).

Role of Assessment

With NCLB comes increased student expectations and teacher accountability. To measure both, state assessments in various academic areas are now administered annually to all students in kindergarten through eighth grade (U.S. Department of Education, n.d.(a)). Reading assessments have received much attention, as these measure children's literacy levels, and determine how many students are reading at grade-level. Schools that receive Reading First funds are held accountable for administering more than just the state annual assessments, they

must administer additional achievement tests and benchmarking instruments to get a continuous picture of students' reading achievement (Kauerz, 2002; U.S. Department of Education, n.d.(b)).

Such formative evaluations can help to make educational decisions that will assist children who are having difficulty. When a child is not performing commensurate with his or her peers or is not performing up to a performance standard, this child can be identified as needing additional reading resources (Deno, 2003). When such assessments begin in kindergarten, as they do in Reading First schools, the goal is to prevent reading failure (Shinn, 2002). When students can be identified as having reading difficulty as young as kindergarten and first grade, educators can make early program modifications and implement reading interventions to address and remedy such difficulties. If difficulties are not discovered until the end of first grade, it becomes difficult to prevent a reading problem, and efforts must then be focused on treating a reading problem (Good & Kaminski, 1996).

Role of Teachers

Research has indicated what skills should be included in reading instruction and what type of reading instruction should be used, but another equally important aspect is the teachers who actually implement the reading programs. This has proven to be a difficult aspect to influence. A well-documented gap exists between what research asserts to be the most effective way to teach reading, and the actual practice of teaching reading. Teachers' lack of knowledge regarding language structure and their perceptions toward approaches to teaching reading may be possible factors in students' low level of reading achievement (Bos et al., 2001; McCutchen, Harry, et al., 2002; Moats, 1994; Troyer & Yopp, 1990).

Moats (1994) developed the Informal Survey of Linguistic Knowledge to determine knowledge of language structure, and administered it to a variety of educators involved in

teaching reading, including classroom teachers, reading teachers, and special education teachers. According to survey results, these staff members were not well-versed in language structure, and were not able to distinguish the differences between phonology, phonetics, and phonics. Furthermore, only 10-30% could correctly identify phonics concepts, while the majority of staff could not explain spelling rules and conventions. Moats concluded that school staff responsible for teaching students to read were not prepared for such a task, as they did not possess adequate knowledge of necessary skills.

Less experienced kindergarten teachers, those most recently graduated, were more knowledgeable about the concept of phonemic awareness, as were kindergarten teachers who had their Master's Degrees, when compared to teachers with more experience and those who held Bachelor's Degrees. However, only 35% of teachers surveyed were familiar with phonemic awareness, and most did not view the concept as the most important of five emergent literacy skills. Instead, the teachers rated a large vocabulary as the most critical skill, followed by rhyming, blending, segmenting, and counting syllables. These findings suggest that teachers do not have the necessary knowledge of phonemic principles and may not fully value the importance of these principles for future reading success, further documenting the need for teachers to acquire additional knowledge in this area (Troyer & Yopp, 1990).

Teachers' Knowledge and Attitudes

Bos et al. (2001) examined differences between preservice and inservice teachers on measures of language structure knowledge, perceptions about explicit and implicit code reading instruction, and perceptions regarding preparedness to teach. Inservice educators were more knowledgeable about the structure of language than were preservice educators, and special education teachers were more knowledgeable than general education teachers. Inservice teachers

with more than 11 years of experience also performed better on the knowledge assessment than teachers with 1 to 5 years of experience. However, all groups answered less than two-thirds of the questions correctly (Bos et al.).

On the perceptions of reading instruction measure, both general and special education inservice teachers indicated more positive attitudes than preservice teachers towards explicit code instruction. However, special education teachers were more positive than general education teachers toward explicit code instruction, for both preservice and inservice educators (Bos et al., 2001). Preservice and inservice teachers who felt positive toward explicit code instruction were more likely to use principles of phonological awareness and phonics in their instruction. It was also found that teachers with positive perceptions about explicit code instruction felt more prepared to teach readers of all ability levels, and knowledge of language structure was also positively correlated with feeling prepared to teach for both preservice and inservice teachers (Bos et al.).

This study raises additional concerns about both preservice and inservice teacher preparation for teaching reading. All groups answered less than two-thirds of the questions correctly. Most were not familiar with the terminology associated with reading concepts such as syllable, consonant blend, and digraph; and although the majority of teachers agreed with the importance of phonemic awareness and phonics, they were not able to accurately define phonemic awareness and seemed to lack basic knowledge of phonics (Bos et al., 2001).

Teachers Knowledge and Attitudes Relating to Student Outcomes

McCutchen, Harry, et al. (2002) designed a study to examine the relationship between similar teacher variables and student outcomes. They measured (1) teachers' phonological knowledge, (2) teachers' general knowledge, (3) the relationship between teachers' knowledge,

approach to reading instruction, and classroom practices, and (4) the relationship between teacher phonological knowledge and student outcomes. Teachers were administered surveys to assess their phonological knowledge, and general knowledge, as well as their attitudes about three theoretical orientations of reading instruction: phonics, skills, and whole-language. These teachers were then observed during their reading instruction three to four times throughout the school year to determine if these variables influenced classroom practice. Student measures were also gathered. Kindergarten students were assessed on word reading measures, while first- and second-grade students were assessed on vocabulary, comprehension, spelling, and writing fluency measures. All student assessment took place at the end of the school year (McCutchen, Harry, et al.).

Teachers answered only 30-35% of language-related questions correctly, but were able to answer more general knowledge questions correctly. It was found that teachers with higher phonological knowledge incorporated more explicit phonological activities into their classroom instruction throughout the year. In kindergarten teachers, phonological knowledge and use of explicit phonological instruction was significantly correlated to their students end of the year word reading achievement. No significant correlations were found for first or second grade (McCutchen, Harry, et al., 2002).

This study demonstrates a link between teacher knowledge and student outcomes, but also added to the concern of teachers not being fully knowledgeable in language-related concepts. This again leads us to question how effective teachers are at teaching children to read. One limitation of this study is that the student achievement measures were assessed only at one point during the year, instead of measuring growth within the year. It is therefore difficult to

discriminate whether it was truly the teacher variable affecting this change, or if other factors were involved.

McCutchen and Berninger (1999) designed a study to determine if teachers' phonological knowledge could be deepened with professional development. They developed a two-week summer institute for kindergarten and first grade teachers to re-experience what it is like to be a beginning reader. Specific topics included phonological awareness, orthographic awareness, alphabetic principle, functional reading system, functional writing system, motivation, language and cultural issues, and conceptual issues. The teachers were given the Informal Survey of Linguistic Knowledge (Moats, 1994) both before and after their participation in the summer institute. Throughout the following school year, these teachers were observed in their classrooms during reading instruction. Kindergarten students were assessed on measures of phonological awareness and orthographic fluency, and first grade students were assessed on measures of phonological awareness, word reading, comprehension, spelling, and composition fluency (McCutchen & Berninger).

Despite having a low initial phonological knowledge as measured by the survey, teachers who attended the summer institute were able to increase their knowledge. Attending the summer institute also appeared to make the concept of the alphabetic principle more salient, as these teachers spent more time on this concept in their classrooms than control teachers. This study also found that both kindergarten and first-grade students in experimental classrooms exhibited more growth in the measured areas than did students in control classrooms (McCutchen & Berninger, 1999). This study illustrated that teachers' knowledge of English phonology can improve with professional development. However the student achievement measures used were

not identified, and the amount of growth displayed was not quantified, and so the implications of this study are limited.

McCutchen, Abbott, et al. (2002) sought to remedy this and designed a study to show kindergarten and first-grade growth on a variety of different measures for students whose teachers participated in a two-week summer institute similar to the one described above. Teachers who took part in the institute subsequently incorporated more explicit activities into their classrooms; experimental kindergarten classrooms spent more time on explicit phonemic awareness and phonics instruction than did control kindergarten classrooms, and experimental first-grade classrooms spent more time on explicit comprehension instruction than did first-grade classrooms in the control condition. As for student outcomes, students in experimental kindergarten classrooms made greater gains in orthographic fluency, than did their counterparts in control classrooms. It was also found that in kindergarten classrooms, regardless of experimental condition, more time spent on explicit instruction in phonemic awareness and phonics resulted in greater growth on phonological awareness, orthographic fluency, and word reading measures. First-grade classrooms in the experimental condition outperformed control classrooms on all measures, which included reading comprehension, vocabulary, spelling, and composition fluency (McCutchen, Abbott, et al.).

This study provided additional evidence that a two-week professional development series can produce change in student outcomes, but there were no differences noted between teachers in the experimental condition. Teachers were not grouped on their level of knowledge, only on their attendance at the institute. However, it is likely that teachers continue to portray individual differences in their knowledge and skill level, and examining these differences could clarify what teacher variables generate increased student outcomes.

Richmond (2007) attempted to address a limitation in the Bos et al. (2001) study, namely, to determine if differences in inservice teachers' phonological knowledge or attitudes regarding reading instruction would emerge after undergoing a professional development course. The teachers included in this study had taken part in professional development due to their schools' involvement with the Reading First initiative.

There were 79 teachers included in the study from four Reading First schools, and they consisted of kindergarten through third grade classroom teachers, special education teachers, reading teachers, reading coaches, and other related specialists. Due to the district's participation in Reading First, all of the teachers had completed the New York State Reading Academy, a web-based program focusing on research-based reading instruction and assessment, and 80 additional professional development course content, training on topics such as differentiated instruction, intervention planning, small group instruction, phonemic awareness, and teaching at-risk and low socioeconomic (SES) readers. They were also trained to measure students' early literacy skills using the Dynamic Indicators of Basic Early Literacy Skills ([DIBELS] Good & Kaminski, 2002) and how to link assessment results to intervention. These schools also employed the use of a coaching model, as there was a reading coach at every school who had undergone extensive training. These reading coaches assisted in the assessment and progress monitoring of students, and aided teachers on topics of reading instruction and interventions. Regional reading coordinators were also available to provide additional support.

The teachers were administered a modified language structure assessment based on assessment given by Mather, Bos, and Babur (2001), and perception survey based on a survey given by Bos et al. (2001). The teachers from this study, who had been through professional development, displayed slightly more knowledge of language structure, but they did not exhibit a

more positive attitude toward explicit code instruction than teachers in Bos et al.. In contrast to Bos et al., no differences in knowledge or attitudes were found between general education and special education teachers, or by years of experience. A moderately strong correlation emerged between teachers' age and attitudes, as older teachers tended to have a more positive attitude regarding explicit reading instruction. This study also corroborated the finding by Bos et al., that teachers with more knowledge held more positive attitudes toward explicit code instruction. However, the study had a small sample size and no measure of teacher knowledge and attitudes regarding reading instruction prior to teacher participation in professional development, which limits possible implications with respect to the impact of professional development. This study led to questions regarding how these teacher variables may affect student reading outcomes.

Present Study

The previous study surveyed teachers in Reading First schools, and assessed their knowledge of phonology and their attitudes toward explicit and implicit reading instruction. The aim of this study is to further these findings at the first-grade level and link the teachers' data with their students' reading achievement data. This study attempts to address the limitations of previously reviewed studies. One, when determining if the teacher variable of phonological knowledge is related to student outcomes, a growth measure of student reading achievement will be used, instead of a one-time measure. This will better discriminate the teacher's role in student achievement. Two, the student achievement growth measures will be displayed and quantified to provide additional information to the field. Three, this study will examine individual teacher variables, instead of grouping teachers together on a dichotomous scale to further differentiate what teacher variable, if any, has an affect on student achievement growth. Four, the link between teacher perceptions about theoretical orientations of reading instruction and student

achievement growth will be examined. The purpose of this study is to determine whether the previously measured teacher variables of phonological knowledge and attitudes toward reading instruction are related to student reading growth in first grade.

CHAPTER THREE

Methodology

Participants

This study consisted of 11 first-grade classroom teachers from four Reading First elementary schools in an urban school district in New York State. The participants' mean age was 27 years; 10 (91%) were female, and one (9%) was male; seven (64%) were white, one (9%) was Latino, and three (27%) did not indicate their ethnicity. The participants had been teaching for a mean of 14.5 years, and had been teaching first grade for a mean of 6.8 years. The student population of this district is 65% African American, 21% Hispanic, 12% white, and 2% Asian, Native American, East Indian, and other. Eighty-eight percent of the students were eligible for free or reduced price lunch.

Recruitment

These teachers had participated in a study by Richmond (2007), and their survey results were made available for the present study. Students included in this study were educated in the classrooms of these teachers during the year in which the teachers completed the survey. Data from students who did not complete the necessary measures were excluded.

Confidentiality

Data were not anonymous, but teacher and student identities have been kept confidential by replacing their names with identification numbers. Teachers' names were made available for this study so their survey responses could be linked to their students' data, but identification numbers were assigned to teachers and names were not used in this study. After the link was established, the forms including the teachers' names were destroyed. The school district had

previously compiled the student data, and only identification numbers were used in the database given to the researcher.

Measures

Teacher Perceptions Survey and Knowledge Assessment. The Teacher Perceptions Survey and Knowledge Assessment was administered to teacher participants by Richmond (2007; see Appendix for reproduction of survey). This instrument was based on two surveys; a perceptions survey given by Bos et al. (2001), which was modeled after a measure developed by DeFord (1985), and a knowledge assessment given by Mather et al. (2001). The survey included 12 items that measured attitudes toward reading instruction. Of these, six items represented attitudes toward implicit instruction, with an internal consistency (as measured by Cronbach's coefficient alpha) of .50, and six items represented attitudes toward explicit instruction, with an internal consistency (as measured by Cronbach's coefficient alpha) of .70. Responses were given on a six-point Likert scale ranging from 1 "strongly disagree" to 6 "strongly agree." The survey also included 22 items assessing knowledge of English phonology, with an internal consistency (as measured by Cronbach's coefficient alpha) of .83 (Mather et al.).

Dynamic Indicators of Basic Early Literacy Skills, Sixth Edition (DIBELS). DIBELS (Good & Kaminski, 2002) is an assessment instrument designed to measure the big ideas in reading. It consists of seven measures, which assess reading-related skills, and are administered in a staggered sequence from preschool to third grade. DIBELS measures consist of one-minute probes that are individually administered. Students in the participating schools were administered probes for the appropriate measures in the fall, winter, and spring of the school year.

This study looked at two of the DIBELS measures, Phonemic Segmentation Fluency (PSF) to assess students' phonemic awareness, and Nonsense Word Fluency (NWF) to assess

students' alphabetic principle knowledge. PSF was administered to students in the spring of kindergarten and first grade as part of the schools' assessment program. For this measure, students are given a three- to four-phoneme word and are asked to verbally segment the word into individual phonemes. For example, if the student was presented with the word "mat," he or she would have to verbally produce the individual phonemes of /m/ /a/ /t/. The correct number of individual phonemes identified in one minute determines the score. The benchmark goal outlined by DIBELS for spring of kindergarten and first grade is 35 or more phonemes correct per minute (<http://dibels.uoregon.edu/measures.php>).

The two-week alternate form reliability of PSF in May of kindergarten is .88, and the one-month alternate form reliability is .79 (Kaminski & Good, 1996; Good et al., 2004). Concurrent validity with the Woodcock-Johnson Psycho-Educational Battery Readiness Cluster score in the spring of kindergarten is .54, and with the Comprehensive Test of Phonological Processing (CTOPP) Phonological Awareness Composite is .53 (Good et al.; Hintze, Ryan, & Stoner, 2003). Concurrent validity with the kindergarten Developmental Reading Assessment (DRA) Instructional Reading Level is .48, and with Test of Early Reading Ability, third edition (TERA-3) Reading Quotient is .43 (Rouse & Fantuzzo, 2006). Predictive validity of PSF in the spring of kindergarten is .62 with winter of first-grade DIBELS NWF, .68 with spring of first-grade Woodcock-Johnson Psycho-Educational Battery total Reading Cluster, and .62 with spring of first-grade curriculum-based measures Oral Reading Fluency ([CBM ORF]; Good et al.). Predictive validity of kindergarten PSF with first-grade DRA Instructional Reading Level is .55, and ranges from .49 to .53 for the TerraNova constructs of Reading, Vocabulary, and Language (Rouse & Fantuzzo).

NWF was administered to the students in the spring of kindergarten and first grade as part of the schools' assessment program. For this measure, students are shown a page of nonsense words, consisting of vowel-consonant and consonant-vowel-consonant combinations, and are asked to read the word or read the individual phonemes of the word. For example, if the student was presented with the word "muv," he or she would have to read /muv/ or verbally produce the phonemes, /m/ /u/ /v/. The correct number of letter-sounds generated in one minute determines the score. The benchmark goal outlined by DIBELS for spring of kindergarten is 25 or more letter-sounds correct per minute, and 50 or more letter-sounds correct for mid-first grade (<http://dibels.uoregon.edu/measures.php>).

The one-month alternate form reliability of NWF in January of first grade is .83 (Good et al., 2004). Concurrent validity with the kindergarten DRA Instructional Reading Level is .62, and with the TERA-3 Reading Quotient is .53 (Rouse & Fantuzzo, 2006). Concurrent validity for first grade is .36 in January and .59 in February with the Woodcock-Johnson Psycho-Educational Battery-Revised Readiness Cluster score (Good et al.). For the middle of first grade, concurrent validity with the Phonetic Decoding Efficiency and Sight Word Efficiency subtests of the Tests of Word Reading Efficiency (TOWRE), is .75 and .68 respectively (Burke & Hagan-Burke, 2007). Predictive validity of kindergarten NWF with first-grade DRA instructional reading level is .63, and ranges from .50 to .57 for the TerraNova constructs of Reading, Vocabulary, and Language (Rouse & Fantuzzo). Predictive validity of NWF in January of first grade is .82 with CBM ORF in May of first grade, .60 with CBM ORF in May of second grade, and .66 with the Woodcock-Johnson Psycho-Educational Battery Total Reading Cluster score (Good et al., 2004).

Procedures

This study was approved by the Institutional Review Board. Teacher measures were collected by Richmond (2007) during the 2005-2006 school year, and entered into a data file which was made available for the current study. Trained school personnel administered PSF and NWF benchmarks to students in the spring of their kindergarten and first-grade years, in accordance with the DIBELS manual and the schools' participation in Reading First. The students' PSF and NWF benchmark scores were stored in a data file maintained by the school district, and were made available for this study with the district's consent. Growth measures were calculated by quantifying the difference between each student's performance on the first grade spring benchmarks and the kindergarten spring benchmarks.

Data Analysis

To address the research questions outlined in Chapter One, the data were analyzed using correlations to determine (a) relationships between teachers' knowledge of English phonology and their students' growth on PSF and NWF benchmarks, and (b) relationships between teachers' attitudes toward explicit and implicit reading instruction and their students' growth on PSF and NWF benchmarks. Absolute levels of achievement for the students' kindergarten and first-grade benchmarks were also considered to see if any additional relationships between these benchmarks and teacher variables emerged. The data were further analyzed using regression analysis to determine what teacher variables, if any, predicted growth on PSF and NWF benchmarks.

CHAPTER FOUR

Results

Descriptive statistics of teacher variables and aggregate student measures are displayed in Table 1. Means and standard deviations are presented for teachers' knowledge of English phonology and teachers' attitudes toward explicit and implicit reading instruction, as well as student PSF and NWF growth, and PSF and NWF achievement levels in the spring of kindergarten and first grade. Teachers obtained a mean knowledge score of 16.27 out of a possible 22 points, or answered approximately 73% of the questions correctly. Teachers' obtained mean attitude scores of 5.50 and 4.53 regarding explicit and implicit reading instruction, respectively. Their responses indicated that they perceived explicit instruction as mostly positive, and implicit instruction as fairly positive, with no observable preference for one method. Students demonstrated more growth on NWF than PSF, although there was more variability across students associated with NWF growth. PSF achievement increased by approximately 7 correct phonemes per minute between kindergarten and first grade, but the standard deviation decreased in first grade suggesting that variability between students' score had decreased and there was more consistency of scores across students. NWF achievement increased by approximately 35 letter-sounds correct per minute from kindergarten to first grade, with more variability of scores found in first grade.

Table 1

Descriptive Statistics for Teacher Variables and Aggregate Student Measures

	M	SD
Knowledge	16.27	3.35
Explicit Attitude	5.50	0.45
Implicit Attitude	4.53	0.41
PSF Growth	14.44	7.00
PSF K Achievement	41.47	26.45
PSF 1 Achievement	48.86	7.48
NWF Growth	34.81	11.48
NWF K Achievement	25.43	8.20
NWF 1 Achievement	60.43	15.03

Note. $n=11$.

Descriptive statistics for each classroom are shown in Table 2. Means and standard deviations are presented for each class' PSF and NWF growth, and their PSF and NWF achievement levels in the spring of kindergarten and first grade. Class sizes ranged from 10 to 14 students. PSF growth ranged from 5-27 phonemes correct per minute between classrooms, although classrooms exhibiting lower growth tended to have high levels of kindergarten PSF achievement. In kindergarten, mean classroom PSF scores tended to range from 23-46 phonemes correct per minute, with the exception of teacher 9's classroom, whose mean PSF was approximately 9. By spring of first grade, PSF scores had increased, including teacher 9's classroom whose mean PSF increased to 34. NWF growth ranged from 16-53 letter-sounds correct per minute. In kindergarten, NWF scores ranged from 21-32 letter-sounds correct per minute, excluding teacher 9's class, whose mean NWF was approximately 3. By spring of first grade, NWF scores increased and had a range of 43-77, without teacher 9's class, whose mean NWF has increased to approximately 30.

Table 2

Means (and Standard Deviations) for PSF and NWF Measures by Classroom

	<i>n</i>	PSF			NWF		
		Growth	K	1	Growth	K	1
Teacher 1	10	18.60 (10.38)	33.60 (19.51)	52.20 (10.38)	21.40 (9.47)	32.50 (15.99)	53.90 (17.22)
Teacher 2	13	27.38 (19.60)	23.92 (19.44)	51.31 (6.77)	32.69 (21.94)	26.69 (15.85)	59.38 (31.72)
Teacher 3	12	14.00 (18.32)	26.50 (21.87)	40.50 (17.70)	16.13 (15.59)	25.67 (17.20)	43.92 (20.42)
Teacher 4	14	5.57 (13.95)	43.43 (11.33)	49.00 (9.92)	44.93 (26.00)	31.00 (16.62)	75.93 (31.95)
Teacher 5	12	12.33 (21.32)	46.42 (18.66)	58.75 (7.50)	45.50 (25.14)	30.42 (15.47)	75.92 (27.85)
Teacher 6	11	15.00 (19.70)	44.27 (20.75)	59.27 (6.44)	42.55 (22.62)	27.82 (12.83)	70.36 (30.08)
Teacher 7	10	13.00 (14.37)	40.60 (14.69)	53.60 (6.83)	39.40 (17.23)	29.30 (13.80)	66.70 (26.83)
Teacher 8	13	5.54 (16.76)	39.00 (15.03)	44.54 (11.61)	26.15 (16.84)	28.15 (14.95)	54.31 (16.18)
Teacher 9	10	25.20 (18.53)	8.90 (15.03)	34.10 (16.36)	27.20 (33.93)	2.60 (2.72)	29.80 (34.36)
Teacher 10	13	12.08 (11.98)	35.54 (12.34)	47.62 (8.45)	33.38 (19.51)	21.69 (10.93)	55.08 (24.08)
Teacher 11	11	10.09 (12.27)	36.45 (14.71)	46.55 (10.70)	53.55 (22.33)	23.91 (11.89)	77.45 (31.45)

Pearson Product Moment Correlations between teacher variables and student measures are presented in Table 3. A significant, positive correlation emerged between teachers' level of knowledge and their attitude toward explicit reading instruction ($r = .84, p \leq .01$). Significant, positive correlations emerged between teachers' knowledge and kindergarten NWF achievement ($r = .80, p \leq .01$), and between teachers' attitudes toward explicit instruction and kindergarten NWF achievement ($r = .79, p \leq .01$), but because we cannot link kindergarten outcomes to first-grade teachers, these findings appear to be due to chance or another unknown variable.

A few correlations did not approach statistical significance, but were within the moderate range. These include a possible relationship between teachers' knowledge and first-grade PSF achievement ($r = .46$) and NWF achievement ($r = .46$), as well as teachers' attitudes toward explicit reading instruction and first-grade PSF achievement ($r = .55$) and NWF achievement ($r = .45$). However, due to the small sample size, these results should be viewed with caution.

Significant correlations emerged between student measures which are also presented in Table 3. Growth on NWF was positively correlated with kindergarten PSF achievement ($r = .71, p \leq .05$), and with first-grade NWF achievement ($r = .84, p \leq .01$). First-grade PSF achievement was positively correlated with kindergarten NWF achievement ($r = .74, p \leq .01$). First-grade NWF achievement was positively correlated with kindergarten PSF achievement ($r = .69, p \leq .05$), first-grade PSF achievement ($r = .76, p \leq .01$), and kindergarten NWF achievement ($r = .69, p \leq .05$).

Table 3

Correlations between Teacher Variables and Student Measures

	1	2	3	4	5	6	7	8	9
1 Knowledge	--	.84**	.07	-.36	.03	.38	.46	.80**	.46
2 Explicit	.84**	--	.16	-.22	.02	-.00	.55	.79**	.45
3 Implicit	.07	.16	--	-.05	-.12	-.13	-.01	.27	.07
4 PSF Growth	-.36	-.22	-.05	--	-.34	-.49	-.16	-.48	-.52
5 NWF Growth	.03	.02	-.12	-.34	--	.71*	.49	.18	.84**
6 PSF K Ach	.38	-.00	-.13	-.49	.71*	--	.23	.28	.69*
7 PSF 1 Ach	.46	.55	-.01	-.16	.49	.23	--	.74**	.76**
8 NWF K Ach	.80**	.79**	.27	-.48	.18	.28	.74**	--	.69*
9 NWF 1 Ach	.46	.45	.07	-.52	.84**	.69*	.76**	.69*	--

* $p < .05$. ** $p < .01$.

A regression analysis was performed using teacher variables as independent variables, and PSF growth as the dependent variable. A regression analysis was also performed using NWF growth as the dependent variable. The results of these regression analyses are presented in Table 4. Teacher variables did not account for a significant amount of the variance in PSF or NWF growth.

Table 4

Regression Analysis for Teacher Variables Predicting PSF and NWF Growth

	PSF			NWF		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Knowledge	-1.25	1.33	-.60	.04	2.36	.01
Explicit Attitude	4.50	10.00	.29	.69	17.67	.03
Implicit Attitude	-1.02	6.10	-.06	-3.61	10.78	-.13

CHAPTER FIVE

Discussion

This study sought to determine if teacher variables were related to student outcomes. The first research question considered teachers' knowledge of English phonology and how it related to student growth in early literacy skills, as measured by DIBELS PSF and NWF. On the knowledge assessment, teachers answered approximately 73% of the questions correctly. These results may indicate a slightly higher level of knowledge for this group of first-grade teachers than for the inservice and preservice teachers surveyed by Bos et al. (2001), who only answered 67% of questions correctly. Although it is unknown whether this level of knowledge is adequate when teaching children to read, there should be a concern regarding the 27% of questions answered incorrectly. This survey encompassed concepts of phonemic awareness and phonics, and incorrect answers signal a misinterpretation or lack of knowledge of these concepts. This could adversely affect students' reading achievement if concepts are not accurately conveyed or are omitted altogether in instructional programs. Research has continued to document the need for beginning readers to acquire and understand the skills of phonemic awareness and phonics, but teachers who do not possess adequate knowledge of these concepts cannot effectively teach them to their students (Brown & Felton, 1990; Foorman, Francis, Novy, & Liberman, 1991; Torgesen, Morgan, & Davis, 1992; Kozminsky & Kozminsky, 1995).

The teachers in this study may have evidenced a higher level of knowledge due to their involvement with professional development through Reading First, which included the NYS Reading Academy and trainings on various topics, including phonemic awareness, and teaching at-risk and low SES readers. However, these teachers did not exhibit a thorough knowledge of the concepts assessed, supporting the notion that teachers should continue to participate in

professional development regarding crucial reading topics (Moats & Foorman, 2003; Spear-Swerling, Brucker, & Alfano, 2005).

Teachers' knowledge was positively correlated with teachers' attitudes toward explicit instruction. This corroborates the findings by Bos et al. (2001) that teachers with more knowledge have a more positive attitude regarding explicit instruction. Teachers' knowledge was also correlated positively with kindergarten NWF achievement, which would suggest that teachers with more knowledge had students who performed better on spring NWF benchmarks in kindergarten. However, the study concentrated on first-grade teachers and kindergarten outcomes cannot be attributed to the knowledge and attitudes of their first-grade teachers. Thus, these findings appear to be due to chance or some other unknown variable.

The second research question addressed teachers' attitudes toward explicit and implicit reading instruction and how these attitudes related to student reading growth, again measured by DIBELS benchmarks. On the attitudes survey, teachers' responses indicated that they felt positive toward both implicit and explicit methods of instruction, with a slightly more positive attitude regarding explicit instruction. However, their scores did not evidence a strong preference for either method of instruction. This is interesting in light of their involvement with Reading First which mandates the use of research-based (i.e. explicit) instruction. Research has continued to indicate that explicit instruction is beneficial for students, especially those who are lower performing or who enter school with lower reading readiness (Foorman et al., 1998; Juel & Minden-Cupp, 2000; Foorman & Torgesen, 2001; Connor, Morrison, & Katch, 2004; Meier & Sullivan, 2004). Teachers' attitudes toward explicit instruction was found to be positively correlated with kindergarten NWF achievement, but again kindergarten outcomes cannot be linked to first-grade teachers, and so it appears that this finding is also due to chance.

The first-grade teachers' language knowledge and attitudes regarding explicit instruction may have been at a sufficient level as the majority of students' attained spring PSF and NWF benchmarks. The classroom means of 9 out of 10 classrooms were at or above the spring PSF benchmark, and 8 out of 10 classrooms met the spring NWF benchmark. The growth of PSF appeared to be low, but classrooms with the lowest growth had higher mean levels of kindergarten PSF achievement. However, the growth variable does not appear to be highly relevant as students in most classrooms met the DIBELS benchmarks. The growth of NWF ranged considerably across classrooms, but again the achievement level in spring of first grade was adequate for most classrooms, as they met the benchmarks.

Correlations also revealed relationships between kindergarten and first-grade benchmarks. Higher kindergarten PSF scores were correlated to higher NWF growth, and higher first-grade NWF scores. Higher kindergarten NWF scores were correlated with higher first-grade PSF and NWF scores. These findings indicate that students who performed well on kindergarten benchmarks, continued to perform well on first-grade benchmarks, and although this does not directly support the "Matthew Effect" in reading, it demonstrates that students who experience early reading success are likely to continue experiencing such success (Stanovich, 1986; McNamara, Scissons, & Dahleu, 2005; Foster & Miller, 2007; Morgan & Fuchs, 2007).

The presence of relationships between teachers' knowledge, teachers' attitudes toward explicit instruction, and first-grade reading achievement are unknown. Although these correlations did not reach a level of significance, this may have been due to limited statistical power because of the small sample size. These correlations were found to be in moderate range, which may indicate a relationship. Further research with a larger sample size is needed to clarify these relationships.

Teachers' knowledge and attitudes did not appear to be associated with growth on the reading measures. However, results from this study cannot lead to the conclusion that these teacher variables are not related to student growth due to the limited sample size and the level of kindergarten achievement. The mean performance for most classrooms was at or above the benchmark standards, indicating that these students were on track to acquire their early literacy skills prior to their placement with the first-grade teachers. Teachers' performance on the survey may not be as relevant for students who are meeting standards. Students with emerging or established literacy skills have not been found to benefit from explicit instruction as much as those who are at-risk for reading failure (Foorman & Torgesen, 2001).

Limitations

The results of this study were likely affected by its limitations. Because the study was focused on reading outcomes in first grade, only first-grade teachers involved in Richmond's (2007) study were included. The small sample size ($n=11$) likely limited the statistical power of the correlations, which would subsequently limit the results. With a larger sample, stronger correlations may emerge that would further define the relationship between teacher knowledge and attitudes, and student outcomes.

This study also used a simplistic growth measure. Growth for each classroom was measured as the difference between mean first-grade and mean kindergarten achievement. This measure spans different school years, which introduces classroom and teacher differences that were not accounted for, as well as summer vacation, during which considerable regression may have occurred. Using fall and spring measures from within the same year may give a more accurate account of the effect that the first-grade teachers had on achievement.

Future Research

The measured level of teachers' knowledge and attitudes, as well as the moderate correlations found between teacher variables and student achievement lend themselves to future directions for investigation. Teachers with the highest knowledge levels could be surveyed to determine if they feel most prepared to teach readers of all abilities, which would corroborate the findings by Bos et al. (2001). Teachers could also be observed to clarify whether explicit or implicit instruction is used more often, considering that teachers reported feeling positively about both instructional approaches. Such observations could also determine if teachers who felt most positive about explicit reading instruction utilized the most phonemic awareness and phonics activities within their classrooms, which would also support findings by Bos et al.. Knowledge of actual classroom instruction and how this translates to students' achievement has the potential to inform instructional practice.

The study could also be replicated with a larger sample size to clarify the current findings and to investigate additional correlations. With a larger sample size the moderate correlations that were found between teacher variables and first-grade reading achievement could be further defined. This study could also be extended to include more grade levels, which would help to generalize findings between teacher variables and student outcomes. A greater understanding of the relationships between teachers' language knowledge and attitudes toward reading instruction, and student achievement could better inform preservice teacher training and inservice teacher professional development.

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APPENDIX

Teacher Perceptions Survey and Linguistic Knowledge Assessment

Please circle the appropriate response or fill in the blank as necessary.

Gender: Male Female Age: _____ Ethnicity: _____
 Certification: Elementary Education Special Education Other: _____
 Education Level: _____ Number of Literacy Courses Taken: _____
 Current Grade Level(s): K 1 2 3 Other: _____
 Total Years Taught: _____ Years Taught Current Grade: _____
 Years Taught at Current School: _____

Please rate these statements on the following scale:

1 2 3 4 5 6
 Strongly Disagree Disagree Mildly Disagree Mildly Agree Agree Strongly Agree

1. If a beginning reader reads "house" for the written word "home," the response should not be corrected.
 1 2 3 4 5 6
2. K-2 teachers should know how to assess and teach phonological awareness (i.e., knowing that spoken language can be broken down into smaller units: words, syllables, phonemes).
 1 2 3 4 5 6
3. All children can learn to read using literature-based, authentic texts.
 1 2 3 4 5 6
4. Controlling text through consistent spelling patterns (The fat cat sat on a hat.) is an effective method for children who struggle to learn to identify words.
 1 2 3 4 5 6
5. Time spent reading contributes directly to reading improvement.
 1 2 3 4 5 6
6. Poor phonemic awareness (awareness of the individual sounds in words) contributes to early reading failure.
 1 2 3 4 5 6
7. Learning to use context clues (syntax and semantics) is more important than learning to use grapho-phonics cues (letters and sounds) when learning to read.
 1 2 3 4 5 6
8. It is important for teachers to demonstrate to struggling readers how to segment words into phonemes when reading and spelling.
 1 2 3 4 5 6
9. Phonics instruction is beneficial for children who are struggling to learn to read.
 1 2 3 4 5 6
10. K-2 teachers should know how to teach phonics (letter-sound correspondences).
 1 2 3 4 5 6
11. Adult-child shared book reading enhances language and literacy growth.
 1 2 3 4 5 6

12. Picture cues can help children identify words in the early stages of reading.

1 2 3 4 5 6

Please circle the correct response.

1. Which word contains a short vowel sound?

(a) treat (b) start (c) slip (d) paw (e) father

2. A phoneme refers to a

(a) single letter (b) single speech sound (c) single unit of meaning (d) grapheme

3. A pronounceable group of letter containing a vowel sound is a

(a) phoneme (b) grapheme (c) syllable (d) morpheme

4. If tife were a word, the letter i would probably sound like the i in

(a) if (b) beautiful (c) find (d) ceiling (e) sing

5. A combination of two or three consonants pronounced so that each letter keeps its own identity is called a

(a) silent consonant (b) consonant digraph (c) diphthong (d) consonant blend

6. A schwa sound is found in the word

(a) cotton (b) phoneme (c) stopping (d) preview (e) grouping

7. A diphthong is found in the word

(a) coat (b) boy (c) battle (d) sing (e) been

8. A voiced consonant digraph is in the word

(a) think (b) ship (c) whip (d) the (e) photo

9. Two combined letter that represent one single speech sound are

(a) schwa (b) consonant blend (c) phonetic (d) digraph (e) diphthong

10. How many speech sounds are in the word eight?

(a) two (b) three (c) four (d) five

11. How many speech sounds are in the word box?

(a) one (b) two (c) three (d) four

12. How many speech sounds are in the word grass?

(a) two (b) three (c) four (d) five

13. Why may students confuse the sounds /b/ and /p/ or /f/ and /v/?

(a) Students are visually scanning the letters in a way that letters are misperceived.

(b) The students can't remember the letter sounds so they are randomly guessing.

(c) The speech sounds within each pair are produced in the same place and in the same way, but one is voiced and the other is not.

(d) The speech sounds within each pair are both voiced and produced in the back of the mouth.

14. What type of task would this be: "I am going to say a word and then I want you to break the word apart. Tell me each of the sounds in the word dog."

(a) blending (b) rhyming (c) segmentation (d) manipulation

15. What type of task would this be: "I am going to say some sounds that will make one word when you put them together. What does /sh/ /oe/ say?"

(a) blending (b) rhyming (c) segmentation (d) manipulation

16. Mark the statement that is false.

(a) Phonological awareness is a precursor to phonics.

(b) Phonological awareness is an oral language activity.

- (c) Phonological awareness is a method of reading instruction that begins with individual letters and sounds.
- (d) Many children acquire phonological awareness from language activities and reading.
17. A reading method that focuses on teaching the application of speech sounds to letters is called
- (a) phonics (b) phonemics (c) orthography (d) phonetics (e) either (a) or (d)
18. What is the rule for using a ck in spelling?
- (a) when the vowel sound is a diphthong (b) when the vowel sound is short
- (c) when the vowel sound is long (d) any of the above
19. Count the number of syllables for the word unbelievable.
- (a) 4 (b) 5 (c) 6 (d) 7
20. Count the number of syllables in the word pics
- (a) 1 (b) 2 (c) 3 (d) 4
21. If you say the word, and then reverse the order of the sounds, ice would be
- (a) easy (b) sea (c) size (d) sigh
22. If you say the word, and then reverse the order of the sounds, enough would be
- (a) fun (b) phone (c) funny (d) one