**Examining Phonemic Awareness and Concepts of Print Patterns of Kindergarten Students**

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Necessary prerequisites for and at the same time powerful predictors of children's success in beginning reading are the development of phonemic awareness and concepts of print. Students who are learning to read need to be taught how to consciously attend to phonemes and to develop an understanding regarding concepts about print. This study was two-fold. First, we examined demographic characteristics that included gender, socioeconomics, preschool experience, and race to determine how these factors related to phonemic awareness and concepts of print development for kindergarten students. It was concluded that low SES children and Latino children were at greater risk of not developing phonemic awareness and concepts of print in kindergarten. Further data were collected and analyzed to examine low SES and Latino children's knowledge of phonemic awareness and concepts of print development. The study found that, along with maturation, a diagnostic approach that guides phonemic awareness instruction and concepts about print enhances kindergarten students' phonemic awareness and concepts of print development.

Almost 20 years ago, Mason (1984) examined reading from a developmental perspective and stated:

"Three characteristics of language are woven into children's understanding of reading: (a) determining how words and concepts are shared by speech and print, (b) realizing how to break speech sounds into the abstract phonemic units that correspond to letters and letter groups, and (c) acquiring conventional information - labels, rules and procedures - needed to describe and carry out reading tasks" (p. 510).

The present study examined student capabilities on two of these developmental variables; phonemic awareness and concepts about print were examined for kindergarten students in order to explore levels of development of at-risk learners.

Importance of Phonemic Awareness

Phonemic awareness, or the ability to focus on and manipulate phonemes in spoken words, has been found to be a critical process in learning to read (e.g., Liberman, Shankweiler, Fischer & Carter, 1974; Snow, Burns, & Griffin, 1998; Yopp & Yopp, 2000). Recent research (Ehri, Nunes, Willows, Schuster, Yaghoub-Zadeh, & Shanahan 2001) suggests a strong link between phonemic awareness and word recognition and ultimately to reading comprehension, revolving around phases or stages of word recognition development (Adams, 1990; Andersen, Hiebert, Scott, & Wilkerson, 1985; Gough & Hillinger, 1980; Juel, 1988; National Reading Panel, 2000; Perfetti, Beck, Bell, & Hughes, 1987; Stanovich, 1991). Ehri (1991) adopted terms used by Frith (1985) to describe a three-phase process in the ability to learn and recognize words in print. These consist of logographic, alphabetic, and orthographic phases.

Associating an oral word with a feature of print is the logographic phase. During this phase the learner associates a salient contextualized feature of the word such as a logo, a configuration, a picture, or a letter shape with a word stored in memory (Ehri & Wilce, 1985, 1987; Gough & Hillinger, 1980; Mason, 1980). Ehri (1991) noted that logographic readers are limited to reading words by sight and by association with visual symbols as they occur in the contextual environment in which they are located. This is analogous to the broader concept of environmental print; however, logographic reading becomes more refined as children recognize the features of letter and letter combinations. In the logographic phase, associations are formed by salient features of words such as word shape, letter features, and visual component association with print (i.e., Nike swoosh with word Nike). These salient features serve as arbitrary signs for recognizing words. Due to these arbitrary associations, there are limited developmental processors that allow the reader to map onto existing orthographic knowledge causing the reader to struggle in the ability to recognize words consistently (Mason, 1980).

As logographic readers become frustrated in their limited ability to recognize words consistently, and as they strive to gain further knowledge about letter symbols and their sound relationships, they progress into the alphabetic phase of reading. The occurrence of this phase is attributed to the students developing knowledge of grapheme-phoneme relationships in their word recognition. This capability is considered the best predictor of how well children will learn to read in the primary grades (Ball & Blackman, 1991; Clay, 1985; Ehri, et al., 2001; Heilman, Blair & Rupley, 2001; National Reading Panel, 2000; Share, Jorm, Maclean, & Mathews, 1984). Embedded in the alphabetic phase is phonological receding, which involves mastery of the system generalizations for mapping onto phonological forms. Ehri (1991) summarized the phonological receding skills as those that enable "readers to read words by applying grapheme-phoneme correspondence rules" (p. 398). Other researchers developing models of word recognition acquisition (Gibson, 1965; Gough & Hillinger, 1980; Mason, 1980) also emphasize the importance of phonemic awareness early in the reading process. According to these models, once readers acquire the ability to focus on and manipulate phonemes in spoken words, word recognition is then typically characterized as being capacity free, enabling the reader to focus on getting meaning.

According to research conducted by Adams (1990) and LaBerge and Samuels (1974), once learners successfully progress through the alphabetic phase, they develop a richer sense of orthographic knowledge, which is predicated on the idea that words are analyzed without phonological conversions. Features of this phase are characteristically similar to the concept of automaticity. As students progress through the phases of word recognition and develop a sense of orthographic knowledge, it is generalized that as "competence increases, the variance associated with accession of phonological knowledge should reduce to insignificant proportions of the variance in word recognition." (Willson & Rupley, 1993, p. 35).

Phase and stage models of word recognition dictate that, in order to become successful in the orthographic phase of word recognition, which ultimately frees the reader from phonological receding and leads to fluent meaningful reading, the reader must successfully develop phonemic knowledge. While there is substantial research to indicate that phonemic awareness is a prerequisite for learning to read (Juel, Griffith, & Gough, 1986; National Panel of Reading, 2000; Tunmer & Nesdale, 1982), research conducted by Perfetti, Beck, Bell and Hughes (1987) and Yopp (1992) found that the relationship between phonemic awareness and learning to read is most likely one of reciprocal causation. It appears credible that phonemic awareness influences a young reader's ability to gain meaningful reading instruction and, at the same time, it also appears that meaningful reading instruction facilitates phonemic awareness. It would seem, then, that phonemic awareness facilitates beginning reading development, and without successful development of phonemic awareness, learners will have difficulty becoming successful readers (Griffith & Olson, 1992; Juel, 1988). Phonemic awareness further supports reading development as children are better able to interact more with print through reading decodable books and engaging in writing activities, which affords them practice in applying their acquired skills.

Importance of Concepts of Print

While concepts of print were frequently examined and reported in the literature 20 to 30 years ago, relatively little research in this area has been reported in recent years. While the current focus in early reading development has focused on the crucial aspects of phonemic awareness, children entering kindergarten are faced with the additional task of simultaneously learning many new concepts and terms that are essential to their success in beginning reading (Hardy, Stennett & Smythe, 1974). The language of visual and auditory instruction is often brand new to the kindergarten student, and failure to understand these conventions can strongly impact a child's success in the early reading stages (Hardy et al., 1974; Johns, 1972; Johns, 1980). These conventions of reading are often described as the social and task constraints of reading (clay, 1972; Hillerich, 1978; Johns, 1972). These tasks hinge on understanding the terms that are used to talk about reading, such as, "Find the top of the page; begin reading the first sentence; locate the word; turn the page; and what is the title of the book?" In addition to understanding these concepts, beginning readers must also know the arbitrary rules that govern the act of reading, such as knowing that one reads from left to right, top to bottom, that punctuation serves a purpose, and that words have an ordinal and or spatial feature (Mason, 1984). The process of learning to read consists of discovering, rediscovering and elaborating on the functions and conventions of the writing system. For many students, learning to read places them in a state of cognitive confusion. In order to be a successful reader, this confusion must give way to cognitive clarity (Downing, 1979).

Thirty years ago, Hardy et al. (1974) concluded that visual language concepts such as identifying the left and right-hand side of the page, finding the title, and locating a line within the text were difficult concepts for kindergarten students to develop and, by the end of the school year, many kindergarten students still lacked cognitive clarity about these terms and concepts. While the National Reading Panel's (2000) report emphasized the importance of auditory skills, Hardy et al. (1974) concluded that it is essential for students to develop and understand both auditory and visual concepts in order for successful reading to take place.

Characteristics of Phonemic Awareness and Concepts of Print

Most children enter kindergarten with a substantial oral vocabulary, adequate amounts of syntactic knowledge, and sufficient command of most of the phonemes that constitute their oral language (Chall, 1999; Yopp, 1992). Even with these monumental successes with oral language, kindergarten students typically lack phonemic awareness and concepts of print (Hardy et al., 1974; National Reading Panel, 2000). Yopp (1992) further concluded that performing tasks related to phonemic awareness is difficult for kindergarten students, who are attending to meaning and contextual information associated with Chall's (1999) Stage O of reading development. The tasks associated with the development of phonemic awareness require that children view speech as an object, which means that they shift their attention away from the content of speech to the form of speech, and that they be able to manipulate phonemes in spoken words. The National Reading Panel (2000) summarized the tasks usually used to assess phonemic awareness:

1. Phoneme isolation (recognizing individual sounds in words) (/k/a/t/)

2. Phoneme identity (recognizing common sounds in different words) (d-ad, p-ad)

3. Phoneme categorization (recognizing the word with the different sound in a sequence of words) (pour, more, some, soar)

4. Phoneme blending (listening to a sequence of separately spoken sounds and combining them to form a recognizable word) (/b/ /a/ /t/ bat)

5. Phoneme segmentation (breaking a word into its sounds by counting the sounds in each word) (dogs - /a/ /o/ /g/ /s/ - 4)

6. Phoneme deletion (recognizing what word remains when a specified phoneme is removed) (cat - IcI - at)

Several important skills related to phonemic awareness and reading development that are usually viewed as prerequisites to phonemic awareness are the ability to recognize rhyme, onsets and rimes, blending and splitting phonemes, and segmenting phonemes in spoken words (Griffith & Olson, 1992; Yopp & Yopp, 2000). Knowledge of syllables is enhanced when onsets and rimes are used for segmenting speech sounds and associating these sounds with their written representations. Development of this skill supports children's ability to use letter-sound correspondences to read and spell words (Griffith & Olson, 1992). According to a substantial body of research (Ehri, 1992; Ehri, et al., 2001; Griffith & Olson, 1992; O'Connor, Notari-Syverson, & Vadsay, 1996; Yopp, 1992), it is important for teachers to understand that phonemic awareness can be a powerful predictor of later reading achievement. This ability in young children can be facilitated by focused instruction and, with training, phonemic awareness can improve beyond the point of simple maturation (National Reading Panel, 2000). In a study conducted by Lundberg, Frost, and Peters.on, as cited in Yopp (1992), it was concluded that students who received training in phonemic awareness made significant progress in reading and spelling acquisition when compared to students who did not receive training.

Hardy et al. (1974) concluded that language instruction in kindergarten is complicated, and that many students do not understand the instructional language being used by the teacher making the acquisition of reading difficult at best. While some children enter kindergarten with concepts for words, letters, sounds, others may find these terms completely new to them. In addition, terminology to describe book parts also varies among entrants to kindergarten. According to clay (1993), important concepts about print are as follows:

1. Can identify the front of a book

2. Understands that print contains a message

3. Knows where to begin reading, which way to go, makes return sweep to left and is capable of matching words

4. Understands the concept of first and last, big and little, can locate directionality or spatial relations and positions

5. Understands the role of punctuation

Hardy et al. (1974) stated that it is essential to identify students' concepts of print and make systematic instructional adjustments so that developmental reading acquisition can occur. Many opportunities for students to develop Mason's constructs mentioned earlier must be provided. There should be many varied opportunities for students to develop knowledge about reading. Evidence reported in Mason's (1984) study indicated the positive results of using informal reading opportunities for enhancing the development of concepts of print. This emergent literacy philosophy suggests that beginning readers need many authentic opportunities to explore reading and writing, as well as being exposed to many different forms of text.

Considerable research supports the importance of phonemic awareness and concepts of print as they relate to word recognition and ultimately to reading comprehension (Hardy et al., 1974; Mason, 1984; National Panel of Reading, 2000; Yopp & Yopp, 2000); studies of associations between student characteristics and the development of these concepts are less common. The present study examines phonemic awareness and concepts of print development across such student variables as gender, preschool experience, socioeconomics, and race for kindergarten students. Examination of student characteristics in regards to phonemic awareness and concepts of print development would reveal those students in traditional kindergarten classrooms who are at greater risk of not developing phonemic awareness and concepts of print.

While the research supports the importance of phonemic awareness and concepts about print related to successful reading development, most of this early literacy research has focused on mainstream populations of children without examining children's performance based on key demographic influences (Craig, Connor, & Washington, 2003). In this regard, there appears to be limited information regarding Latino children's development in either phonemic awareness or concepts about print. With current research focused around overall phonemic awareness development, this study examined not only phonemic awareness but also concepts of print with kindergarten students taking into account a variety of demographic features.

As Chall (1996) has noted, it is during this emergent stage of reading development, that children use the contextual information provided by pictures, the predictable language of the text and the way that stories mimic spoken language to interact with print. Throughout this stage, the reader uses logographic information to make guesses about words. Learners begin to develop phonological insights into the nature of words. For example, they can often identify and create words that rhyme, are conscious that words are made up of sounds, and understand that some of words have the same beginning and ending sounds. It has been noted, however that there are variations in acquisition of phonological knowledge that can be attributed to cultural background. For example, research (Rupley, Rodriguez, Mergen, Willson, & Nichols, 2000) that focused on knowledge and rate of acquisition of structural features associated with word recognition development of Hispanic and nonHispanic second graders found that rate of acquisition was significantly different. Hispanic learners lagged behind their non-Hispanic counterparts, but were acquiring the knowledge of structural features of words in the similar order. In this study, we were interested in examining the various components of phonemic awareness and concepts of print that would take into account the diversity of today's classrooms.

While phonemic awareness may be a significant component of reading development for most kindergarten students, it may need to be supported by developing concepts of print for certain populations of learners who potentially lag behind their counterparts. According to researchers from the National Institutes of Health and the U.S. Department of Education, more research is needed to document literacy development in diverse populations.

The purpose of this study was to examine relationships between selected demographic characteristics of kindergarten students and their phonemic awareness and concept of print development. In addition, the effects of phonemic awareness intervention were analyzed, with the hope of shedding light on the following question: What do teachers need to know about phonemic awareness as it relates to the needs of kindergarten students?

Specifically, this study was guided by the following research questions:

1. Were students with certain characteristics at higher risk for not developing phonemic awareness and concepts of print in kindergarten?

2. Which components of phonemic awareness were present in students?

3. To what extent do phonemic awareness and concepts of print development vary for kindergarten children?

4. Did the students who were in the classrooms of teachers who received phonemic awareness staff development and used the recommended decodable texts make significant gains in the components of phonemic awareness compared to those who did not receive explicit staff development?

Method

Sample

Kindergarten classrooms in three urban schools in the Southeast were studied over a two-year period. The schools were selected because of their instructional programs in reading, their collaborative relationship with the university, their interest in developing a reading program based upon recognized theoretical models of reading, their large Latino populations, and their specific desire to learn more about phonemic awareness development among their students. Random selection was not performed because diagnostic and summative phonemic awareness and concepts of print data from the entire population of kindergarten students at one school were gathered the first year, while diagnostic data were gathered from the entire Latino kindergarten population from all three participating schools the following year. The total sample of students involved in the original study that took the diagnostic pretest consisted of 145 kindergarten students from one urban school in the southeast. The ethnic distribution consisted of 51 white students, 74 African American students, 11 Latino American students, 3 Asian American students, and 6 who identified themselves as other. Eighty-three students were identified as economically disadvantaged based upon established state criteria. Due to attrition, only 105 of the original 145 students were administered the summative posttest. The posttest was administered during the last week of school.

The second set of students, selected the following year, consisted of 53 Latino kindergarten students from three schools within the same district, including students from the original school. This ethnic population of students was identified because they had been recognized as being at risk of not developing phonemic awareness in kindergarten during the initial study. This group of students consisted of 24 males and 28 females; 32 were identified as being economically disadvantaged.

Instrumentation

The students in both groups were administered the Curriculum-Based Literacy Assessment Revised (CBLA-R) (Jetton, Rupley, & Willson, 1995), developed by selected teachers in conjunction with researchers from two universities to meet district criteria, which included elements of clay's (1993) Observation Survey and measures associated with the Hardy, Stennett & Smythe, (1974) study. The assessment incorporated and reflected district curriculum guidelines and goals to reduce assessment redundancy. For kindergarten students, measures of alphabetic knowledge, word recognition, concepts about print, and listening comprehension were essential elements of the school district's reading program. Content validity of the CBLA-R is based on the district's reading curriculum and is consistent with the extant research (Adams 1990; Chall, 1999; Ehri, 1992; Juel, 1991; Stanovich 1991). The reliability for all of the subtests ranged from .75 to .94, depending on the topic (Jetton, et al., 1995). The lower reliabilities were typically associated with measures with fewer items.

The diagnostic form of the CBLA-R, which is intended to provide teachers with diagnostic information to guide their instruction, was administered at the beginning of the school year during the initial study, and again at the beginning of the school year two years later for the follow-up study. The results of both administrations of the diagnostic CBLA-R were used to identify individual students' reading strengths and weaknesses. This information was then used by the classroom teachers to plan more effective reading instruction. The Summative assessment version of the CBLA-R was a developmentally more challenging version of the Diagnostic form. The Summative CBLA-R was administered at the end of the initial school year and was used to further assess students' acquisition of reading strategies and skills, as well as to examine gains made in regards to auditory and visual features associated with phonemic awareness and concepts of print.

Each test consisted of consumable student booklets and a teacher's manual. The test can be administered in one sitting or over a number of days, if desired. Based on previous research using the instrument, it was noted that the test is most reliable when administered in the primary grades in small groups or with additional assistants to serve as monitors; therefore, the tests were administered in this manner. The subtests measured the following: recognizing letters from non-letters, naming letters, identifying features of print, recognizing letter sound correspondences, comprehending simple narrative text, recognizing rhyme, demonstrating orthographic knowledge, identifying onsets, and recognizing sight words.

The alphabetic phase, as described in the literature by Ehri, (1992) and Juel (1991), is the phase where children have learned most of the shapes and names of the letters of the alphabet and have acquired a low-level of phonemic awareness that enables them to focus on beginning and ending sounds in words and in letter names. In the past, this knowledge has been measured by having students in kindergarten examine words in isolation to detect the presence of separate sounds in the pronunciation of words (e.g., detecting /b/ in bee). This study used the concept of the alphabetic phase as it examined phonemic awareness and applied it to the diagnostic and summative measure used by the kindergarten classes.

During diagnostic assessment, data were gathered on whether or not students could identify letters from non-letters. Two subtests assessed students' knowledge of letters and background knowledge of letter awareness. Students were asked to identify a letter from a choice of three symbols and had to recognize letters from numbers. Data from the summative test regarding differentiating letters from non-letters was more complex. On this subtest, students are asked to recognize the fact that letters formed words and had to locate the word among three strings of symbols, (e.g., horse, }!/>#^, ##^&\*).

The measure of identifying names of letters was gathered from both the diagnostic and summative tests. Students had to recognize lower and upper case letters named by the teacher and locate the named letter from among a series of other letters.

Subtests that measured functions of print awareness for both the diagnostic and summative instrument sampled students' knowledge of how print functions in our society and were based on clay's Observation Survey. These subtests measured students' knowledge and experiences with print, perceptions of how print is used to communicate, directionality related to reading print, and other concepts of print.

Subtests that were used to measure students' ability to hear sounds in words focused on students' ability to recognize words that begin with the same sound, hear the beginning sounds of words, and isolate the ending sounds of words. Students had to circle the correct letter or letters that represented the sound they heard when pronounced by the teacher.

The subtests used to measure students' listening comprehension of simple narrative text had students listen to orally read text and recall specific story information by answering a series of questions. The questions were based on explicit comprehension and the questions were literal.

The subtests used to measure rhyme were copies of the assessment used by the district to determine students' ability to recognize rhyming sounds. During these subtests students had to determine if two similar words rhymed when pronounced by the examiner and produce rhyming words for the test words.

The abilities of recognizing letters from non-letters, recognizing the names of specific letters from among other letters, identifying concepts about print; hearing sounds in words, comprehending simple narrative text, and recognizing rhymes were measured on both the diagnostic and summative assessments during the initial study. Orthographic knowledge, identifying onsets, and recognizing sight word vocabulary, were measured on the summative assessments and the assessment instrument developed for the following year. Orthographic knowledge was measured by asking students to identify words that had similar spelling patterns. Onsets were sampled by students' visually discriminating common two letter patterns in the initial part of the word. Sight vocabulary was measured by having students identifying 8 Dolch words that were pronounced by the examiner from among 16 Dolch words on a list.

Professional Development and Phonemic Awareness Implementation

To establish consistency across schools and classrooms, participating kindergarten teachers were provided with four professional development seminars. Due to the current interests within this school district, phonemic awareness development was emphasized. While other instructional techniques of reading were being used by the classroom teachers, the district's administration placed a heavy emphasis on phonemic awareness development as recommended by the National Panel's (2000) report on reading, and all training sessions focused on phonemic awareness rather than instruction that would emphasize concepts of print.

During the first session, teachers examined the results of the diagnostic test and began looking for individual student's strengths and weaknesses. Interpretation of the diagnostic data revealed that teachers needed to enhance students' knowledge of: (1) letter sound relationships, (2) attention to sounds in words, and (3) knowledge of rime and word families, as well as continue to provide a multitude of authentic reading experiences to enhance students' knowledge regarding concepts of print. Three two-hour training sessions were devoted to the following:

\* Developing Sound Matching Activities (Yopp, 1992).

\* Using Word Family Activities and Making Words Activities (Cunningham, 1995)

\* Using Read-Aloud Books for Developing Phonemic Awareness (Opitz, 1998; Yopp, 1995).

The sound matching training session used information in Yopp (1992) and focused on how to do a matching sounds activity. This activity instructed students to either match several words with a given sound or to generate a new word that begins with a given sound. Teachers were also shown that they could use pictures during the matching phase and illustrations were used to show them how to make connections within a series of lessons that they were currently using to teach this skill. The teachers were instructed to be as creative as possible and to take advantage of incorporating song into this activity (Yopp, 1992; Yopp & Yopp, 2000).

The word family and making words training was based on instructions found in Cunningham's (1995) Phonics They Use. Each teacher received a copy of this book to use as a resource. Word families, which are also referred to as phonograms, consist of words that have the same vowel and ending letters that rhyme, such as c-at, h-at, f-at. Since the kindergarten students scored low on rhyme, it was determined that word family activities would improve students' ability to recognize rhyme. While there are many different ways to teach word families, the training focused on developing word family categorization games. All words selected for the game shared the same short vowel sound. In order to play the game, the students needed to be able to recognize the three guidewords placed as the heading for each category (i.e., Man, Cat, Nap) and be able to place their word in the correct category. Teachers were trained to have students say the guideword, say their word, and any other words located in that column. Students then had to explain how they knew the word belonged in that column. Teachers were instructed to say that all of these words end with the same sound and after words had been sorted, students were directed to play concentration or memory games with the various word families.

Another training approach that was used during the second session was making words (Cunningham & Cunningham, 1992; Cunningham, 1995). Teachers were instructed to give students letters and guide them to make words. The students could start by making little words and gradually increase the length of their words until all of the letters were used.

The final instructional training session provided the kindergarten teachers with articles by Opitz (1998) and Yopp (1995). The purpose of this session was to focus on the importance of using read-alouds to develop phonemic awareness. Yopp (1995) referred to several studies (Ball & Blachman, 1988; Bradley & Bryant, 1983; Cunningham, 1990) that indicated that phonemic awareness can be explicitly taught to children. However, in contrast to the National Reading Panel's report, Yopp indicated that studies revealed that phonemic awareness may also be facilitated by providing children with language-rich environments that focus on word play in stories, songs, and games (Griffith & Olson, 1992). According to Yopp, "the most accessible, practical, and useful vehicles to enhance students' sensitivity to the phonological basis of their language are children's books that deal playfully with speech sounds through rhyme, alliteration, assonance, or other phoneme manipulation" (p. 538). Therefore, the teachers were provided with information on the criteria used for selecting books and were also instructed on how to use these books effectively. Teachers were encouraged to use rereads to comment on language use, to encourage predictions, and to examine language use for hearing sounds in words. The lists of decodable, phonemic awareness enhancing books generated and compiled by Yopp (1995) and Opitz (1998) were used for teachers to select a minimum of 75 books for use in their classrooms.

Identical training sessions were used the subsequent year for the follow-up study. In addition to the training activities, each teacher participating in the follow-up study received a copy of the National Reading Panel's report on phonemic awareness, along with additional funding to purchase phonemic awareness related texts and activities specifically geared to Latino children.

Data Collection and Analysis

During the initial year of the study, the CBLA-R diagnostic pre-test was administered to all kindergarten students at the participating schools. After receiving training on how to use the assessment instrument, the teachers administered the diagnostic instrument over a one-week period. The instruments were coded and scored by the researchers.

During the initial study the first step was to use descriptive statistics to examine the fall data in order to determine mean scores for each of the subheadings. Descriptive statistics, including frequencies and means, were gathered in order to analyze student performance by classroom teachers and to provide diagnostic information about individual student performance for concepts of phonemic awareness and concepts of print. These data were then used by the classroom teachers to plan instruction based upon individual student's strengths and weaknesses. Once it was determined (based upon the diagnostic pretest data), using Univariate Analysis of Variance, that there were no statistically significant differences at the .01 level between groups of teachers, the students were then pooled in order to analyze phonemic awareness and concepts of print trends between specific groups of participants. Means and standard deviations (SD) were used to describe the performance of different groups (based on gender, preschool experience, socioeconomic status, and race) of kindergarten students on each of the selected components of phonemic awareness and concepts of print as related to comprehension of simple narrative text. The descriptive analysis provided mean scores and standard deviations for each of the components. The descriptive analyses for the data are displayed in Table 1.

Analysis of the diagnostic pretest was intended to answer the following research questions:

1. Were students with certain characteristics at higher risk for not developing phonemic awareness and concepts of print in kindergarten?

2. Which components of phonemic awareness were present in kindergarten students?

3. To what extent do phonemic awareness and concepts of print development vary for kindergarten children?

The descriptive statistics analyzed on the collected posttest data are presented in Table 2; the levels of students' mastery of the components of phonemic awareness and concepts of print based upon the summative data are illustrated. Table 3 is provided as evidence of the initial study's students' growth in the area of phonemic awareness and concepts about print. In order to further examine phonemic awareness and concepts of print development among Latino children, the fall diagnostic assessment was given the following year to a second population of kindergarten students. The descriptive analyses are provided in Table 4.

Results

Means and standard deviations for early kindergarten phonemic awareness and concepts of print development are presented in Table 1. Kindergarten students as a whole, regardless of gender, race, socioeconomic status, and preschool experience, appeared to have a good understanding of what letters are and they could identify letter names by the end of the first 12 weeks of the school year. However, these same students had a more difficult time recognizing the functions and purposes of print and letter sound relationships, especially those that measure onset and rhyme.

The results of an initial analysis showed that gender does not play a significant role in kindergarten students' ability to recognize various components of phonemic awareness or concepts of print. By October, all kindergarten students had acquired the ability to recognize letters from non-letters, and also knew the names of letters at a proficient level. Kindergarten students also knew sounds of the letters at about a 75% accuracy level. However, regardless of gender, the kindergarten students in this study had not reached a proficient level of awareness about functions of print, or the ability to recognize rhyme by October.

As noted in the National Reading Panel's (2000) report and the analyses conducted by Ehri, et al., (2001), socioeconomic status appears to have little bearing on students' phonemic awareness capabilities, except in regards to onset and rhyme. Students in our study who were from a higher socioeconomic range scored slightly better than most other groups of students. This is similar to results shown in the NCES report conducted by West, Denton and Germino Hausken (2000). The children in this study had reached a level of mastery on the subtests used to examine students' ability to recognize letters from non-letters and their ability to recognize the correct letter by name. However, students' awareness of functions of print and the ability to recognize rhyme were areas that showed students needed more knowledge before they could reach a level of mastery. Analysis of the subtests examining the ability to hear sounds in words and simple comprehension of narrative text also indicated that most students had not acquired a level of mastery for these components. While the National Reading Panel's (2000) report and the Ehri, et. al., (2001) analyses reported that SES played a mixed role in phonemic awareness development, our study indicated that 62 children who were identified as economically disadvantaged significantly lagged behind the other children in their abilities to recognize rhyme (see Table 1).

With more and more attention being focused on educational equity issues, this study also examined the relationship between race and the development of phonemic awareness. When comparing students by race, Hispanic students were more likely to have more difficulty with components of phonemic awareness and concepts of print than were students from other ethnic backgrounds. Regardless of race, all students had reached mastery for recognizing letters from non-letters and letter names. However, Hispanic children scored lower on these components, but still had mean scores greater than .70. All children performed at a lower level on the subtests measuring the functions of print and abilities to recognize rhyme (see Table 1).

Although most groups of students scored similarly on each of the diagnostic subtests, differences attributable to demographics were also noted. Students who had received little or no preschool experience, who came from a lower socioeconomic background, and who were of Hispanic ethnicity were at greater risk of not developing phonemic awareness and concepts of print in kindergarten than any other subgroups. These findings are consistent with previous results examining children's ability to recognize words by sight and understand words in context (West, et al., 2000). The National Reading Panel's report also indicated that students who did not use English as their primary language are at greater risk of delayed development of phonemic awareness than other groups of students primarily due to the fact that ESL students are "bound to misperceive some English phonemes because their linguistic minds are programmed to categorize phonemes in their first language" (National Reading Panel, pp. 2-3, 2000). Hardy et al. (1974) also recognized that some groups of children entering kindergarten would either misunderstand or lack the prior knowledge for the instructional discourse and language of the teacher and text, thus delaying the acquisition of important print concepts. While these subgroups did not always test significantly lower in all areas of concepts about print, their scores were generally lower than all other student groups. On the one hand the data showed that, by October, all groups of students, regardless of gender, socioeconomic status, preschool experience, or race, had reached a level of mastery for recognizing letters from non-letters and recognizing letters by names; on the other hand, the data clearly indicated that all students lagged behind for letter sound recognition and comprehension of simple narrative text. Data for functions of print and ability to recognize rhyme were the lowest areas of performance for all students.

Means and standard deviations across gender, socioeconomic status, preschool experience and race are presented in Table 2. The levels of students' mastery for phonemic awareness at the end of one year in school are illustrated. Although most groups of students scored similarly on each of the diagnostic subtests, some demographic trends were noted. Students who had received little or no preschool experience and who came from lower socioeconomic background and were of Hispanic ethnicity were at greater risk of not developing phonemic awareness and concepts of print in kindergarten than any other subgroups. While these subgroups did not always test significantly lower in all areas, their scores were generally lower than all other groups.

Means and standard deviations reflecting end-of-year phonemic awareness and concepts of print are presented in Table 2. Gender again was not related to students' development of phonemic awareness. All students, regardless of gender, were able to recognize letters and words from non-letters and words as well as recognize letters by name. By the end of kindergarten, all students had reached a level of mastery for recognizing letter sound relationships and had made significant gains in comprehension of simple narrative text and the ability to recognize rhyme. On measures that were posttest specific, students had begun to develop orthographic knowledge and were successful at recognizing pre-primer Dolch words by sight. The two areas that most students still struggled with were functions of print and ability to recognize initial onset patterns.

These students also had reached a level of mastery for recognizing letters and words from non-letters and non-words, knew the names of letters, could hear sounds in the beginning and endings of words, and could comprehend simple narrative text, recognize rhyme and pre-primer Dolch words. Students, regardless of socioeconomic status or preschool experience, scored similarly on all subtests except for students' ability to recognize patterns in initial onsets. Students identified as economically disadvantaged scored lower in this area than students who were not. The two areas where students scored below a level of competence were functions of print and ability to recognize onset.

By the end of kindergarten, there appeared to be more similarities among racial groups than differences in regard to the development of phonemic awareness. All students, regardless of race, had reached a level of mastery for recognizing letters and words from non-letters and non-words as well as the ability to recognize lower and upper case letters by name and hear the sounds in the initial and ending parts of words. All children were also successful in the comprehension of simple narrative text and in their ability to recognize preprimer Dolch words by sight. While Hispanic children continued to score lower in concepts of print and certain components of phonemic awareness (i.e., ability to recognize rhyme), considerable gains were noted.

The descriptive statistics presented in Tables 1 and 2 are promising to educators. When teachers use diagnostic data (pre-tests) to guide their instruction of children, it appears teachers can enhance all children's development of phonemic awareness regardless of gender, socioeconomic status, pre-school experience, and race. The trends noted in limited proficiency for certain subgroups of students during the gathering of the diagnostic results were less notable in the collection of the summative results. The only group of children that still indicated lower awareness of rhyme was children of Hispanic ethnicity. However, even with significantly lower performance on the ability to recognize rhyme, this subgroup of children made significant gains between the pre and posttest assessments.

A series of dependent t tests was used to compare improvements in phonemic awareness and to address the following question: Did teachers who received the phonemic awareness professional seminars and who used the recommended decodable texts have students who made significant gains in the components of phonemic awareness?

Significant gains at the .001 level were noted in students' ability to recognize letter names, letter sound relationships, and ability to recognize rhyme. Significant gains at the .005 level were also found for students' comprehension of narrative text (see Table 3). Significant gains were not found for students' ability to recognize letters and words from non-letters and nonwords. One possible explanation for this result could be due to the fact that students had already reached a level of mastery for this subtest prior to taking the post-test and would be reasonable given the results of previous longitudinal data collected on kindergarten students ability to recognize letter names (West, et al., 2000). The other subtest that students did not make a significant gain on was functions/concepts of print, which could possibly indicate that as teachers increase their emphases on phonemic principles, they might begin to lessen their instruction on functions and concepts of print.

In order to further examine phonemic awareness development among Latino children, a fall diagnostic assessment was given the following year to a second population of kindergarten students. Results of the follow-up study's fall diagnostic assessment continue to indicate that kindergarten students of Hispanic origin scored significantly lower on all components of phonemic awareness and concepts of print development when compared to the other students in this study. Students in the follow-up study had extremely limited phonemic awareness recognition in the areas associated with letter names, letter sounds, and rhyme as well as concepts of print (see Tables 4). This suggests that students of Latino background could strongly benefit from explicit phonemic awareness instruction as well as instruction focused on concepts of print. As the National Reading Panel (2000) indicated, children will differ in their phonemic awareness and some students will need more in-depth instruction than others. This study indicates that students of Latino background need explicit instruction in phonemic awareness for a longer period of time than other groups of students. In addition to concepts of print development, phonemic awareness instruction should continue throughout first grade or until mastery occurs.

Discussion and Conclusions

In this study, low SES children and Latino children were at greater risk of not developing phonemic awareness and concepts of print in kindergarten and lagged behind in comparison to their counterparts. This finding is similar to what was found in an earlier study (Rupley, et al., 2000) that indicated that Hispanic second graders lagged behind non-Hispanic second graders in acquiring structural knowledge of words for word recognition. The implication is not that these learners are at risk for developing word recognition strategies, but they are in need of intervention instruction that addresses their needs and in the broadest sense, "catches them up". This implication was evidenced by the support that teachers' use of a diagnostic approach that guides phonemic awareness instruction and concepts about print enhanced kindergarten students' phonemic awareness and concepts of print development.

The results of the initial study indicate that, while most students scored similarly on the diagnostic subtests, students with little or no preschool experience who came from a lower socioeconomic background, or whose ethnic background was Latino, lagged behind in developing phonemic awareness and concepts of print in kindergarten when compared to other groups of students. While these at-risk subgroups scored consistently lower on the diagnostic pretest, the results of the initial study, much like those included in the National Panel's report, indicate positive gains in all students' performance when teachers used diagnostic data to guide their instruction of students. In addition, it could be concluded that providing explicit phonemic awareness instruction based on diagnostic data enhances students' development of phonemic awareness. Teaching phonemic awareness benefits many different students in their ability to learn to read; not only does explicit phonemic awareness instruction benefit average learners, it also strongly enhances the reading performance for at-risk students including those from low socioeconomic backgrounds and whose primary language is not English.

Past reports, other than the National Reading Panel (e.g., Hardy et al, 1974; Johns, 1972; Mason, 1984), verify that the development of reading is more than just the development of phonemic awareness. In order to be a successful reader one must also begin to understand the conventions and functions of print. While all students made gains in their reading development in kindergarten, their concepts of print were consistently lower than any other reading measures and significant gains were not evident. This was even more pronounced for students who were from ESL backgrounds.

When kindergarten teachers use diagnostic data to guide their reading instruction, students, regardless of gender, socioeconomic status, preschool experience or race, reach a level of competence in phonemic awareness and make gains in their development of print concepts. As more states and local school districts increase their focus on performance-based standards in reading, the importance of using diagnostic data to guide instruction becomes increasingly important. When teachers use their knowledge of individual student performance to guide their instruction, the commonalties among students, rather than their differences, become apparent. Since earlier studies (National Reading Panel, 2000) have indicated a significant relationship between phonemic awareness and later successes in reading, teachers must use a variety of stimulating language activities and informed diagnostic data to provide explicit phonemic awareness instruction especially for at-risk students. Adding phonemic awareness instruction and decodable texts into an already language rich classroom should improve students' chances for later reading successes. Teachers should also realize the strong role they play in developing phonemic awareness and concepts of print development, and that building individualized instruction based upon diagnostic data yields gains in both of these components.

The descriptions of phonemic awareness and concepts of print development reflected in this study of kindergarten children are promising to educators. When teachers use diagnostic data to aid and guide their instruction of children, they can enhance all children's development of phonemic awareness regardless of gender, socioeconomic status, preschool experience, and race. The trends noted in limited proficiency for certain subgroups of students during the gathering of the diagnostic data were diminished in the posttest results. The only group of children that was found to have limited awareness of rhyme were Hispanic children. However, even with significantly lower performance ability to recognize rhyme, this subgroup of children made significant gains between pre and posttest. Future research efforts might try to further examine this relationship, with the hope of clarifying this possible difference, especially in areas where Latino children are in the majority. Influences of the home language on kindergarten students' phonemic awareness of English sounds is also an important factor, and should be studied more closely to pinpoint whether the interventions discussed in this study would continue to be successful for all students.

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