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A correlational study examining the relationship between invented spelling and beginning reading

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A CORRELATIONAL STUDY EXAMINING THE RELATIONSHIP BETWEEN
INVENTED SPELLING AND BEGINNING READING

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The Department of Curriculum and Instruction

by

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ABSTRACT

The present study was designed to investigate correlations between invented spelling patterns and beginning reading for low-performing and on-level boys and girls in kindergarten. Two research questions were examined: (1) Is there a statistically significant relationship between invented spelling as displayed in task and reading skills as measured by DIBELS? and (2) Does the performance displayed in task and reading skills as measured by DIBELS differ significantly for boys and girls in kindergarten?

Student performance data was gathered using extant school *Dynamic Indicators of Basic Early Literacy Skills* (DIBELS) benchmarks at collected at midyear of kindergarten. It was hypothesized that kindergarten students who scored below DIBELS benchmark at midyear would not perform as well as kindergarten students who scored on or above DIBELS benchmark at midyear on the invented/temporary spelling and reading tasks. It was further hypothesized that gender would not significantly affect task and beginning reading performance as measured by DIBELS for the kindergarten students in this study.

Data revealed on-level kindergarten participants performed significantly better than low-performing kindergarten participants on the invented/temporary spelling and word-learning tasks. However, there was very little or no statistical correlation between performance among male and female participants on the temporary spelling tasks and the word-learning tasks.

CHAPTER 1

INTRODUCTION

Background

Many studies have attempted to identify the point at which “real reading” takes place. Holdaway (1979) argues children are expected to read and comprehend unfamiliar text independently by relying on print. Ferreriro and Teberosky (1982), endorse the importance of the alphabetic principle. Frith (1985) believes that real reading begins at the alphabetic stage when letter-sound correspondences become evident as phonemic awareness develops, whereas Gough and Hillinger (1980) argue real reading occurs in the cipher stage (i.e., the most complex stage where phoneme segmentation and letter matching take place). Perfetti (1985) proposes that real reading occurs when children rely on fully or truly productive reading, while Sulzby (1989) argues that real reading occurs during conventional reading. The National Research Council (Snow, Burns, & Griffin, 1998) developed the term **conventional reading** to express the common meanings of these different terms mentioned above. Others avoid the term **emergent reader** altogether because of the variations in how it has been defined. Adams (1990) prefers the term **prereader**, which refers to children who have not yet received any formal instruction in reading.

Regardless of the stage at which children learn to read, researchers agree that learning to read and write takes place prior to the time most children enter school as they begin to develop an awareness of printed letters and words in their surroundings. The Hart & Risley (1995) study of learned vocabulary provides seminal research into the impact of word learning at early ages based on multiple factors (i.e., socioeconomic

status, sociability, and parenting styles) that affect a child's oral language. Their study indicated preschoolers between 34 and 35 months of age had speaking vocabularies and used numbers of different words very similar to the averages of their parents (p. 176). This fact led Hart and Risely to conclude that by age three children in low socioeconomic households were exposed to fewer words than children of professional households. Specifically, Hart and Risely (1995) estimate young children are exposed to more than 30 million words by age three, as evidenced by their ethnographic study of 42 families, which examined socioeconomic status, race, parental and child interaction in relation to child language acquisition (p. 132). The two researchers discover that children born into low-socioeconomic households are exposed to 600 spoken words per hour, children born into working class households are exposed to 1,200 spoken words per hour, while children born into professional households are exposed to 2,100 words per hour (p. 132). These figures represented 42% of the variance in the children's vocabulary growth, 40% of the variance in their vocabulary use, and 29% of the variance in their IQ scores at three years of age (p. 158). By age four, poor children hear about 13 million words, working class household children hear 26 million, and the professional household children hear 49 million (p. 132). Children from the professional households have a larger speaking vocabulary than parents of the low socioeconomic child. As a follow-up to this study, Hart and Risely tape recorded the three groups of children from low, middle, and high socioeconomic households at nine and ten years of age. Children from low socioeconomic households had smaller vocabularies and learned words at a slower pace than children from the other two socioeconomic households. Hart and Risely (2003) use their longitudinal data of the 42 families to conclude: "We were awestruck at

how our measures of accomplishments at 3 predicted language skill at 9 to 10” (p. 11). Their studies reveal the need for developing oral language skills as early as possible in order to build and maintain reading achievement in the primary years. Hart and Risely (1992) argue “To keep the language experience of welfare children equal to that of working-class children, the welfare children would need to receive 63,000 words per week of additional language experience. ... Just to provide an average welfare child with an amount of weekly language experience equal to that of an average working-class child would require 41 hours per week of out-of-home experience as rich in words addressed to the child as that in an average professional home” (p. 1104).

Surprisingly, research has shown that children’s intelligence does not have much of an impact on the ease of learning to read (Burns; 1986; Burns & Richgels, 1989; Chall, 1999; Moats, 2000; NRP, 2000; Rayner, Foorman, Perfetti, Pesetsky, & Seidenberg, 2002; Shankweiler, et al., 1995; Shaywitz, 2003; Snow, Burns, & Griffin, 1998; Stanovich, 1991; Stanovich, et al., 1984). In fact, Rayner, et al. (2002) concludes that “More recently, researchers have found that children who have difficulty learning to read often have above-average IQs” (p. 72). Rather, the capacity to learn to read and write is more closely related to children’s age-related developmental stages, although there is no clear evidence on the precise chronological or mental age on a particular developmental level that children must reach before they are ready to learn to read and write (Snow, et al., 1998). Investigations by Foorman, Francis, Beeler, Winikates, and Fletcher (1997) reflect that 80% of the variance in reading comprehension in first grade depends upon how well students sound out and recognize words out of context. As the brain develops and children are exposed to new experiences, new neural connections are established in

irregular intervals with spurts and plateaus (Shankweiler, et al., 1995; Shaywitz, 2003; Snow, et al., 1998). Although this process is somewhat orderly, it is highly dependent on individual experiences and physiological development. Successful readers tend to display age-appropriate sensory, perceptual, cognitive, and social skills as they develop through preschool (Adams, 1990; Collins & Cheek, 1999; Farstrup, 2002; Snow, et al., 1998).

One recent study that tested the theoretical model of early reading development was a two-year longitudinal study of 102 kindergarten and first-grade students (Morris, Bloodgood, Lomax, & Perney, 2003). More specifically, the study tested a hypothesis regarding the growth of word knowledge in kindergarten and first-grade students learning to read. Interview data was collected from eight kindergarten and first-grade teachers in the fall and again in the spring to document the type and intensity of literacy instruction taught in their classrooms. The students in the study included 58 boys and 44 girls attending a rural mountain school in Appalachia, North Carolina. Two schools included students from a lower-middle socioeconomic status (40% free and reduced lunch) and two other schools included those from a more heterogeneous socioeconomic status (28% free and reduced lunch). Four classrooms from each of the two schools (total of eight classrooms) were the focus on this study, all of which had a teacher with a minimum of 10 years teaching experience and an aide. Ninety-seven percent were Caucasian students, which is representative of the typical population in that geographical area. Six researchers individually assessed students five times during the study (i.e., September, February, and May in Kindergarten; October and May in first grade). The reliability of the assessments used Cronbach's alpha, with an interrater reliability of .70 to .91.

Students were assessed based on alphabetic knowledge, beginning consonant awareness, concept of word in text (i.e., finger-pointing to words in text), spelling with beginning and ending consonants (i.e., invented spelling), phoneme segmentation, word recognition, and contextual reading (p. 304).

In order to determine if students entering kindergarten followed a path in learning to read similar to that of students entering first grade, the 102 children were equally divided into high-readiness and low-readiness groups, based on their alphabetic-knowledge scores. Results indicated that there was no real distinction between these groups on each variable (p. 318). In addition, concept of word in text and its temporal relationship to phoneme segmentation showed minimum growth during the kindergarten. Therefore, the study examined invented spelling patterns as an alternative method for analyzing the relationship between concepts of word in text with phoneme segmentation and discovered that concept of word in text preceded phoneme segmentation during the second half of kindergarten (p. 319). Instructional implications were developed as a result of the teacher interviews. Based on these interviews, a developmental sequence of early reading acquisition was constructed as follows (see Table 1).

Conclusions for Morris, et al. (2003) require the need to incorporate multiple instructional strategies, including systematic teaching of the alphabet and beginning consonants as well as guiding kindergarten students in finger-pointing when reading simple and engaging texts (e.g., two-sentence dictated stories or Big Books). The study also reveals a need for consistent teacher modeling and plentiful opportunities for students to practice finger-pointing independently. Providing ample writing opportunities in the form of stories, journal entries, list making, and picture captions would also be of

Table 1. Kindergarten and first-grade teacher’s perceptions of developmental sequence of reading acquisition.

Grade Level	Developmental Level/Skill
Kindergarten	1. Alphabet knowledge
	2. Beginning consonant awareness
	3. Concept of word in text
	4. Spelling with beginning and ending consonants
	5. Phoneme segmentation
First Grade	6. Word recognition
	7. Contextual reading ability

value in bolstering early literacy acquisition. Morris and his research team argue that it is crucial to provide small group instruction for those who do not master the skills with the majority of the class, by providing direct, explicit teaching of the alphabetic principle including, phonemic awareness. The older, meaning-based approaches such as language and shared-book experiences can be used later on to develop word recognition in text and sound units in words (pp. 321-322).

Statement of the Problem

The role of spelling instruction in early literacy instruction is emerging from the rote memorization of an arrangement of letters within a list of words to the realization that spelling can be an important writing tool that communicates what is known about words and how to read those words. According to Ehri (1994, 1997) and Landerl, Frith, and Wimmer (1996), phonological and orthographic representations of words are so closely bound together that they operate in tandem (i.e., seeing a written word does not

automatically reveal the correct pronunciation of that word; the sound of a word does not automatically reveal the correct spelling or orthographic image of that word). Other researchers agree by viewing phonological decoding as a type of self-teaching strategy that helps students develop reading and writing skills because much of their spelling knowledge involves some form(s) of reading and writing (Goodman, 1993; Laminack & Wood, 1996; Share & Stanovich, 1995; Shaywitz, 2003). Furthermore, based on the need addressed by the National Research Council's Committee on the Prevention of Reading Difficulties in Young Children (Snow, et al., 1998), teachers, parents, and tutors should welcome phonics instruction as part of an integrated language arts curriculum where reading, writing, and spelling are not taught in isolation, but as related, interdependent components in the process of teaching students to read. There is a lack of quantitative and anecdotal research on how invented spelling patterns are part of the developmental phase of learning to read and write, as well as the implications for early literacy instruction.

Purpose of the Study

Invented spelling is a term used to describe the creative spelling of words that a child uses when he does not know the conventional spelling. Much research has been completed regarding inventive and/or temporary spelling, and its importance for early writing development. This is particularly evident in the development of phonemic awareness (Adams, 1990, NRP, 2000, Snow, et al., 1998). Invented spelling and printed word learning in kindergarten can help predict future reading achievement of children beginning to read up to one year later as evidenced by various correlational studies that examined emergent literacy, word recognition, and text comprehension (Clark, 1988; Ferrioli & Shanahan, 1987; McGee & Richgels, 2000; Richgels, 1986a, 1986b, 1987,

1989, 1995; 2001; Richgels & Barnhart, 1992; Shaywitz, 2003; Zutell & Rasinski, 1989; Zutell, 1992).

Other research has embodied an experimental approach to study the relationship between invented spelling and word learning. For example, Ehri and Wilce (1985, 1987) taught kindergarten students to be inventive spellers and then taught them to read by first teaching them how to spell phonetically simplified words, including nonsense and real English words and word parts. Conclusions about the success of spelling-trained kindergarten students being due to their learned phonological awareness in written text caught the attention of many other researchers. Hence, an extensive research project developed, which enabled Ehri and others to study other factors that might uncover correlations between early word reading, such as memory, alphabet knowledge, attention to the visual configuration of words, and phonological awareness (Bear, Invernizzi, Templeton, & Johnson, 2000; Calfee, 1998; Chall, 1996; Craig, 2003; Ehri, 1983, 1986, 1989, 1994, 1995; Ehri, Nunes, Shahl, & Willows, 2001; Foorman, Francis, Fletcher, Schatschneider, & Mehita, 1998; Moats, 1999, 2000; Muter & Snowling, 1998; NRP, 2000; Snow, et al., 1998; Stahl, Duffy-Hester, & Stahl, 1998; Stahl & Murray, 1998; Stahl, Stahl, & McKenna, 1999; Troia, 1999).

The purpose of this correlational study was to investigate the relationship of invented spelling and beginning reading with kindergarten-aged boys and girls who read below and on grade level in order to suggest future reading success among kindergarten students. The diversity between the two groups of kindergarten students included their current (i.e., midyear) benchmark status on early literacy skills as evidenced by scores produced using the *Dynamic Indicators of Basic Early Literacy Skills* (DIBELS) (Good

& Kaminski, 2003) screening measure. This study examined the relationship between the current level of early literacy skills and the student's ability to spell words phonetically as a beginning reader. In addition, this study also sought to determine if gender provided any significant correlations on task and beginning reading performance among kindergarten students participating in the study.

Setting

The setting for the research study took place in a rural elementary public school. The researcher requested permission from the district school superintendent in the form of a letter to conduct research about early literacy among kindergarten students. Once permission was granted, the researcher contacted the principal at the elementary school where the research occurred. A meeting was scheduled to discuss the study and meet the kindergarten teachers at the school site. At this meeting, the principal and teachers were debriefed on the details of the study and then presented with Child Consent Forms and a parent letter to distribute to all of the kindergarten students enrolled at the school. All screening, invented spelling and word-learning tasks were performed outside the regular kindergarten classroom in an empty classroom selected by the principal of the school. All tasks were administered in the same order and sequence on a one-to-one basis between the researcher and the subject.

Significance of the Study

Inventive/temporary spelling can be a powerful tool in vocabulary development in early education classrooms when young children are encouraged to use invented spelling in their writing rather than focusing only on those words they can spell correctly (Gunderson & Shapiro, 1987, 1988; Clarke, 1988; Stice & Bertrand, 1990; Stahl &

Murray, 1998). Therefore, teachers can implement strategies to include invented spelling into writing assignments for the purpose of developing vocabulary conscious students.

This research project can benefit students, researchers, educators, and policy makers. Information collected from this study will enrich the data that are available regarding teaching emergent literacy by connecting them to concrete student data gathered in a realistic classroom setting.

Research Questions

The following research questions guided the researcher in the research process:

1. Is there a statistically significant relationship between invented spelling as displayed in task and reading skills as measured by DIBELS?
2. Does the performance displayed in task and reading skills as measured by DIBELS differ significantly for boys and girls in kindergarten?

Definition of Terms

To facilitate this study, a listing of relevant definitions follows:

Alphabetic Principle - the ability to associate sounds with letters and use those sounds to form words

Decoding - the ability to determine how to read unfamiliar words by using sound-symbol relationships and word patterns

DIBELS - *Dynamic Indicators of Basic Early Literacy Skills*, 6th edition; a screening assessment of early literacy skills that can predict future reading success

Early Phonemic Spelling - phonemic awareness exists for some letters; usually occurs in kindergarten or beginning of first grade

Fluency - the ability to read text accurately, quickly and with expression so that time can be devoted to comprehension

Graphemes - the letters and spelling that represent the sounds in written language

Integrated Spelling Instruction - an instructional approach that teaches reading, writing, and spelling together because of the developmental nature of these three related skills

Invented Spelling - a child's best attempt at spelling a word using what they know about the English spelling system; also known as temporary spelling

Linguistics - the study of human language

Low-Performing Readers - kindergarten students that score below benchmark status using the DIBELS mid-year measure

On-Level Readers - kindergarten students that score on or above benchmark status using the DIBELS mid-year measure

Orthography - a set of rules about how to write correctly in the writing system of a language

Prephonemic Spelling - scribbled writings without meaning common among preschool and beginning kindergarten children

Phoneme - the individual sounds in words

Phonemic Awareness - the ability to hear, identify, and manipulate the individual sounds, or phonemes, in spoken words

Phonetics – the study of speech sounds

Phonetic Spelling – stage where phonemic awareness exists for all letters along with the concept of print, that usually occurs at the end of kindergarten or beginning of first grade

Phonics – an instructional approach to teaching reading and spelling that emphasizes the symbol/sound relationships, used especially in beginning reading instruction

Phonological Awareness - the conscious ability to think about and/or manipulate the sounds of language

Phonology - describes the manner in which sounds function within a language

Standard Spelling - stage where conventional spelling occurs with minimal errors that usually occurs by the end of third grade or in the fourth grade

Temporary Spelling - a child's best attempt at spelling a word using what they know about the English spelling system; also known as invented spelling

Transitional Spelling - stage where there is internalization of orthography although the rules are not always used correctly that usually occurs between first- and third-grades

CHAPTER 2

REVIEW OF LITERATURE

Introduction

In today's society, learning to spell is an integral part of becoming literate. Reading and spelling are important language skills that emerge as children begin to understand and interpret their world. Developmental learners need encouragement and space to explore the possibilities of language. The ways in which spelling has been conceptualized has evolved dramatically over the past few decades, from viewing spelling simply as a tool for writing to recognize that spelling offers perhaps the best window on what an individual knows about words. In her attempt to define spelling, Ehri (1994) acknowledges the ambiguity of the term as a pure science. Instead, she capitulates that spelling:

...can function as a verb to refer to the act of spelling a word by writing it; however, it can also function as a noun to refer to the product that is written, the word's spelling consisting of a sequence of letters. Spellings of words are the targets not only of spelling behavior, but also of reading behavior." (p. 24)

According to Chomsky (1976), the major need for inventive spellers learning to read is to have someone answer their questions and correct their mistakes, such as the misreading of words when necessary. However, the research that drives this study follows a view quite opposite that of the linguist Chomsky, who believes that only an innate biological ability all humans possess (i.e., Language Acquisition Device (LAD)) makes it possible communication to occur. Chomsky (1970, 1976) and others suggest a

strong links exists between spelling and morphology, and becoming aware of those patterns extend word knowledge in consequential ways (Derwing, Smith, & Wiebe, 1995; Fischer, Shankweiler, & Liberman, 1985; Fowler & Liberman, 1995). Fischer, et al. (1985) argues that “spelling is not a skill that is fully acquired as a part of an elementary education” (pp. 438-439).

The review of literature that follows describes a different approach to spelling than Chomsky (1970). Chall (1996), Cooper (1993), Derwing, et al. (1995), Ehri (1991, 1994), Fisher, et al. (1985), Fowler and Liberman (1995), Gentry (1978, 1982a, 1982b, 2001, 2004), Gough, Juel, & Griffith (1992) and Routman (1994, 1996) by viewing spelling from a developmental perspective. The viewpoint discussed defines invented spelling along with the implications for early literacy instruction reflective of the viewpoint that spelling is a developmental process that involves conceptual learning rather than mere rote memorization of the spelling of words.

Frith (1985), an advocate of the developmental spelling concept, believes “spelling is the pacemaker for reading at the early levels” (p. 301). Others agree with Frith in their conclusions that much of a student’s spelling knowledge is derived from reading and writing (Goodman, 1993; Laminack & Wood, 1996; Smith, 1978, 1983; Wilde, 1991). In addition, a study conducted by the National Research Council’s Committee on the Prevention of Reading Difficulties in Young Children (Snow, et al., 1998) argue invented spelling patterns can allow teachers, parents, and tutors a window into a child’s understanding of and ability to apply phonics when learning to spell words. In order to move forward with how spelling and learning to read are related, phonics and its relationship to spelling are defined.

Invented/Temporary Spelling

Invented and/or temporary spelling refers to young children's attempts to use their best judgments about spelling. Vacca, Vacca, and Gove (1995) define invented spelling as the "name given to children's misspellings before they have learned the rules of spelling.... by using invented spelling, children expect their writing to make sense and have meaning" (p. 79). When students are allowed to use invented spelling, they can become more creative writers. On the other hand, when students feel that every word must be spelled correctly, "writing becomes a laborious undertaking rather than a meaning-making act" (p. 81). Young children using invented spelling employ a considerably greater variety of words in their writing than those encouraged to use only the words they can spell correctly (Clarke, 1988; Gunderson & Shapiro, 1987, 1988; Moats, 2000; Share & Stanovich, 1995; Shaywitz, 2003; Stice & Bertrand, 1990).

In one of the first major studies of children's beginning attempts at learning to spell, Read (1975) examined the writing of 30 preschoolers who were able to identify and name the letters of the alphabet and to relate the letter names to the sounds of words. The students had "invented" spellings for words by arranging letters. Read argues that, "One sees clearly that different children chose the same phonetically motivated spellings to a degree that can hardly be explained as resulting from random choice or the influence of adults" (p. 420). In other words, even at an early age, the children were able to detect phonetic characteristics of words that English spelling represents. Read concluded that, ultimately "learning to spell is not a matter of memorizing words, but a developmental process that culminates in a much greater understanding of English spelling than simple relationships between speech sounds and their graphic representations" (p. 420). In a

similar study Guthrie (1973) wanted to see if there was a correlation between words read correctly and word spelled correctly. Nineteen on-level second-grade students and 19 below-level second-grade students were asked to read and spell real and nonsense words. For the on-level students, very high correlations existed between the number of real words read and the number of real words spelled correctly ($r=.84$). Even stronger correlations were found to exist between the number of nonsense words read and spelled phonetically ($r=.91$) for on-level second-grade students. Correlations were not as strong for the below-level students on real words read and spelled ($r=.68$) and for the number of nonsense words read and spelled phonetically ($r=.60$). Several years later, this study was repeated with 19 students in grades three through five which were paired with 19 adults on the same reading level as the elementary aged students (Greenberg, Ehri, & Perin, 1997). When each group was assessed on the number of real words read and spelled correctly, the correlations were much higher for the elementary students ($r=.86$) than the adults ($r=.57$). As in the Guthrie (1973) study, both groups did not perform as well on the nonsense word reading and spelling tasks. However, the third- through fifth-grade students' correlation ($r=.62$) on reading and spelling nonsense words was higher than the adult group's correlation ($r=.41$) for reading and spelling nonsense words.

Clarke (1988) conducted research with two classes of first-grade students who were encouraged to use invented/temporary spellings. Results indicated that these children scored better on tests of spelling and word recognition than did those children who were not encouraged to employ invented/temporary spellings. By the end of the first-grade year, students encouraged to use invented spellings typically score as well or better on standardized tests of spelling than children allowed to use only correct spellings in first

drafts (Clarke, 1988; Stice & Bertrand, 1990). In fact, Bear, Templeton, Invernizzi, & Johnson (2000), Ehri (1995, 1997), Stahl & Murray (1998), and Shanahan (1984) have used spelling to assess phonological awareness. Shanahan (1984) found a correlation of .66 between the performance of second grade students and a correlation of .60 between the performance of fifth grade students on a spelling test and their phonetic reading ability.

Teachers need to be sure that they allow students excellent opportunities to develop as spellers and writers—clearly, using invented spelling techniques accomplishes this goal. Critics of invented spelling mistakenly assume that children who initially use approximate spellings will never become good spellers or that if the time-honored methods of memorizing spelling lists were used instead, every child would become a perfect speller. Neither observed experience nor research supports these assumptions. In early childhood classrooms, it is typical to find children using invented spelling in their writing. Orton (2000) states, “When children begin to use inventive spelling, it is an indication that they are aware of the internal structure of words” (p. 17). Inventive spelling can be a powerful tool for vocabulary development in early education classrooms when young children are encouraged to use invented spelling in their writing rather than focusing only on those words they can spell correctly (Gunderson & Shapiro, 1987, 1988; Clarke, 1988; Gunderson & Shapiro, 1987, 1988; Kross, Rhein, Sammons, & Mather, 2000; Lambardino, Bedford, Fortier, Carter, & Brandi, 1997; Stice & Bertrand, 1990; Shahl & Murray, 1998). Therefore, teachers can implement strategies to include invented spelling into writing assignments for the purpose of developing vocabulary conscious students.

Invented/Temporary Spelling and Phonological Awareness

Stanovich (2000) argues that the most important contribution to how reading is taught is the insight that phonological awareness is related to reading and reading achievement. He based this statement on correlational studies conducted that prove the link between phonological awareness and beginning reading (Stanovich, Cunningham, & Cramer, 1984; Vellutino & Scanlon, 1988) as well as experimental studies (NRP, 2000, Snow, et al., 1998).

The National Reading Panel (NRP) (2000) defines phonemic awareness as the knowledge that spoken words are made up of tiny segments of sound, referred to as phonemes. For example, the words **it** and **he** consist of two phonemes. Stanovich (1994) defines phonological awareness as “the ability to deal explicitly and segmentally with sound units smaller than the syllable” (p. 77). He also notes that researchers “argue intensely” about the meaning of the term and the nature of the tasks used to measure (p. 77). His 1994 definition differs from his 1986 definition in which Stanovich defined phonemic awareness rather vaguely as the “conscious access to the phonemic level of the speech stream, and some ability to manipulate cognitive representations at this level” (p. 361). Adams (1990) defined phonemic awareness based on how the English language is composed of sequences of small units of sound. She divides phonemic awareness into five levels of abilities: the ability to 1) hear rhymes and alliteration as measured by knowledge of nursery rhymes, 2) to do oddity tasks (i.e., comparing and contrasting the sounds of words for rhyme and alliteration), 3) to blend and split syllables, 4) to perform phonemic segmentation (i.e., counting out the number of phonemes in a word), and 5) to

perform phoneme manipulation tasks (i.e., adding, deleting a particular phoneme and regenerating a word from the remainder) (pp. 80-81).

Many researchers agree that since few children acquire phonemic awareness automatically, these skills must be taught (Adams, 1990; Adams, Foorman, Lundberg, & Beeler, 1998; Hall & Moats, 1998; McBride, 1998; Moats, 1999, 2000; NRP, 2000; Snow, et al., 1998). Therefore, educators must make a conscious effort to include explicit phonemic awareness instruction for children learning to read. This can be accomplished by providing frequent opportunities for children to become aware of, think about, and manipulate speech sounds. The theoretical and practical importance of phonological awareness for the beginning reader relies not only on logic but also on the results of several decades of research (Adams, 1990; Adams, et al., 1998; Moats, 1999, 2000; Snow, et al., 1998).

Phonological awareness is measured by performance on a variety of tasks including phoneme counting (e.g., "How many sounds are in 'sheep'?"), phoneme identification (e.g., "What is the last sound in 'cab'?"), and phoneme deletion (e.g., "Say 'steak' with out the /t/."). However, according to Adams (1990), without direct instructional support, phonemic awareness eludes roughly 25% of middle-class first graders and substantially more of those who come from less literacy-rich backgrounds (p. 329). Additional researchers agree that most children likely to become poor readers can be identified with tests of their abilities to manipulate letter sounds, to rapidly name letters and numbers, and to demonstrate an awareness of the concepts of print (Adams, 1990; Moats, 1999; NRP, 2000, Snow, et al., 1998).

According to *Put Reading First* (2001), a publication developed by the Center for the Improvement of Early Reading Achievement (CIERA) and funded by the National Institute for Literacy:

“Teaching phonemic awareness, particularly how to segment words into phonemes, helps children learn to spell. This explanation for this may be that children who have phonemic awareness understand that sounds and letters are related in a predictable way. Thus, they are able to relate the sounds to letters as they spell words. (p. 6)

As a child begins school for the first time, Sipe (2001) argues that teachers must “look closely at children’s emerging capabilities as writers, focusing especially on the issue of invented (or temporary) spelling...” (p. 264). Cooper (1993) argues it is best to think of invented spellings as merely temporary spellings. This concept is important because research indicates that invented spelling develops children’s writing and the ability to spell conventionally. Also, invented spelling frees children to be creative explorers about the relationships between sounds and letters, which is a characteristic of phonemic awareness. In fact, Gentry (2001) argues that there is a large relationship between phonemic awareness and invented spelling, because both move through the same alphabetic stages. Orton (2000) describes invented spelling as “approximating the sounds heard in speech through writing” (p. 18). She argues there is a direct relationship between phonemic awareness and invented spelling in that “each enhances the other,” and advises teachers to encourage inventive spelling so as to develop phonemic awareness (p. 18). In her study with kindergarten children, Orton wanted to investigate the mutually beneficial role that exists between invented spelling and phonemic awareness

as well as how one skill amplifies the other. The Orton (2000) study also wanted to examine the relevance of providing additional phonemic awareness training to kindergarten children who were unsuccessful with phonics based curriculums. Data confirmed that the inventive spellings of children with phonemic awareness training contained more sound segmentation in words than those children without additional training.

Invented/Temporary Spelling and Phonics

For many, phonemic awareness is often confused with phonics. Strickland (1998) argues, “Probably no other aspect of reading instruction is more discussed more hotly debated, and less understood than phonics and its role in learning to read” (p. 4). She defines phonics as instruction in sound/letter relationships used in reading and writing, which includes the use and understanding of the alphabetic principle. Adams (1990) defines phonics as a system of teaching reading that builds on the alphabetic principle, which has a central component, related to the teaching of the correspondences between letters or groups of letters and their pronunciations. She argues that “With respect to the knowledge that is critical to reading, that which can be developed through phonic instruction represents neither the top nor the bottom, but only a realm in between” (p. 421). In other words, phonics alone cannot teach a child to read; rather it is really a set of instructional strategies that communicates how sounds connect with written symbols.

Young children who use invented spellings tend to develop word recognition and phonics skills earlier than children who spell the sounds they hear in words (Clark, 1998; Kroese, Hynd, Knight, Hiemenzm, & Hall, 2000; Lombardino, et al., 1997; Snow, et al., 1998). Strickland (1998) maintains that children are aware that their temporary spellings

do not conform to adult spellings, and are approximations. Although spelling develops differently for each child, predictable error patterns emerge for most students by third grade, which can be addressed instructionally. However, Strickland clarifies that some spelling generalizations and components of word study may not be addressed until later grades (i.e., Latin and Greek root words). Therefore, phonics instruction should emphasize how spellings are related to speech sounds in systematic ways. Because phonemes are the units of sound that are represented by the letters of an alphabet, an awareness of phonemes is key to understanding the logic of the alphabetic principle and, thus, to the ability to learn phonics and spelling (Adams, 1990; Frith, 1985; Hall & Moats, 1998; Moats, 1999, 2000; NRP, 2000; Snow, et al., 1998).

There are many approaches to phonics instruction: 1) synthetic phonics, 2) analytic phonics, 3) analogy-based phonics, 4) onset-rime phonics instruction, embedded phonics, and phonics through spelling (*Put Reading First*, 2001, p. 13). Hall and Moats (1998) argue that phonics has many faces: a reading methodology, an alphabetic system, and strategies to sound out words. Simply stated, phonics refers to the letter-sound correspondences that allow us to sound out written symbols. More specifically, the words we speak are made up of individual bits of sound that are referred to as phonemes. The word **bag**, for example, has three phonemes, /b/, /a/, /g/. In order to make normal conversation possible, the sound bits are strung together rapidly, at about eight to 10 bits per second, and are blended so concisely it is often impossible to separate them.

Unlike phonological awareness, the goal of phonics is to make the alphabetic principle explicit to students. However, many agree with Hall and Moats (1998) that phonics approaches should also include well-designed instruction in comprehension,

writing, vocabulary development, and literature appreciation (Adams, 1990; Moats, 1999, 2000; NRP, 2000; Snow, et al., 1998). In contrast to the meaning-based emphasis of whole-language approach to teaching reading, phonics instruction is code-based, which means the alphabet is used as a code to match sound-symbol relationships in grade appropriate decodable text. Other language skills that emphasize the alphabetic code include syllabication, orthography, morphology, and grammar. The CIERA and NIFL report systematic and explicit phonics instruction significantly improves a child's word recognition, spelling, and reading comprehension, and is most effective when it begins in kindergarten or first grade (p. 19).

The Developmental Stages of Spelling Instruction

Spelling is a developmental process that occurs in various stages. These stages are the foundation of later spelling competency (Gentry, 1987; 1982a; 1982b; 2000a; 2000b; 2001; 2004; Gentry & Gillet, 1993; Nunes, Bryant, & Bindman, 1997; Wilde, 1991). For example, it is common for an emergent speller to go through a babbling stage of spelling, a stage of abbreviated spelling (e.g., **ct** for **cat**), a stage of spelling by ear (e.g., **egl** for **eagle**), and a stage of spelling by eye (**fried** for **fried**) (Gentry, 1987; 2000a; 2000b; 2001; 2004). Developmental spelling is sometimes referred to as **invented spelling**, **temporary spelling**, **creative spelling**, or sound spelling. The term **invented** comes from Piaget (1972), whose theory showed how children reinvent language as they go through the constructive, developmental process of learning to speak.

Read (1971, 1986) was one of the first to study spelling as a developmental process rather than viewing it as merely a process of rote memorization of visual memorization. His conclusions were based primarily on his studies of young children

who began to spell before being exposed to any formal reading instruction. As a result, Read viewed many creative spellings in naturalist and experimental settings in order to identify common linguistic patterns. From these observations, Read concludes learning to spell is more like learning to talk rather than memorization due to the patterns and generalizations that evolve as new words are encountered. For example, in Read's (1971, 1975, 1986) work, the word **trouble** was commonly spelled as CHRIBLS.

Although an error, CHRIBLS reveals the child's awareness of how the English past tense is typically formed (i.e., the first part of **trouble** sounds like the first part of **chuckle**).

The articulated /t/ sounds like /ch/ when "t" precedes the "r." Another common pattern Read identified was the letter "d", which is pronounced as /j/ when it precedes "r" as in the word **drum**. Read concludes that these misspellings are indicative of a child's understanding of linguistic knowledge.

Read (1971, 1975, 1989), Gentry (1978, 1982a, 1982b, 2000a, 2000b, 2001, 2004) and other views learning to spell words as an ongoing process that is developed through real and meaningful experiences with frequent and varied opportunities to notice recurring spelling patterns in words. The more rich orthographic experiences encountered, the easier it becomes to recognize and use spelling patterns to spell words correctly (Templeton, 1979; Templeton & Morris, 2000).

Spelling has traditionally been taught as a separate subject, with strong emphasis on memorization. Many elementary schools use commercially prepared spelling series aimed at teaching spelling in isolation. Fortunately, researchers have infused a new insight into the spelling process. Spelling is now viewed as a complex developmental process. As preschool and early elementary school children discover the complexities of

printed Standard English, they move through several stages of spelling development. Gentry (1978, 1982a, 1982b, 2000a, 2000b, 2001, 2004) followed Read's (1971, 1975, 1986) research, to identify five basic stages of spelling development (i.e., the pre-communicative stage; the semi-phonetic stage; the phonetic stage; the transitional stage; and the correct spelling stage).

In the pre-communicative stage, children use symbols from the alphabet but show no knowledge of letter-sound correspondences. They may not know all of the letters of the alphabet, the distinction between upper- and lower-case letters, and/or the left-to-right progression of Standard English text. In the semi-phonetic stage, the child begins to understand letter-sound correspondence that sounds are assigned to letters in order to make words. At this stage, young children often apply simple logic. For example, children may use a single letter to represent words, sounds, and/or syllables (e.g., the letter **Y** for **why**). Children at the phonetic stage use one letter or group of letters to represent every speech sound heard in a word. Although some of their choices may not match conventional English spelling, the letters written together are systematic and easily understood (e.g., **kom** for **come** and **en** for **in**). During the transitional stage, the speller begins to incorporate the conventional substitute for representing sounds. At this time children become less dependent on phonology (sound) and depend more on visual cues and understanding the structure of words (e.g., **egul** for **eagle** and **higheked** for **hiked**). In the final, correct spelling stage, the speller knows the English orthographic system and its basic rules. The correct speller fundamentally understands how to deal with such things as prefixes and suffixes, silent consonants, alternative spellings, and irregular spellings. As vocabulary and sight words accumulate during the final stage, an added

advantage is that the speller is now able to recognize spelling errors. The child's generalizations about spelling and knowledge of exceptions are usually correct.

Gentry (1982a, 1982b, 2000a, 2000b, 2001, 2004) explains that movement from one spelling stage to the next occurs gradually and is highly variable among children and adults. One stage may coexist in a particular sample of writing, while another stage may coexist in an oral or shared reading activity. However, most children do not oscillate significantly between stages, passing from phonetic back into semi-phonetic spelling or from transitional back to phonetic. Once the stages of this process are identified, elementary teachers can help students develop strategies for learning Standard English spelling, and they can assess students' progress more accurately. Routman (1994) identifies five stages of developmental spelling in her model, which is very similar to Gentry's (1982a, 1982b; 2004) model. The first phase involves prephonemic spelling, which includes various types of scribbled writings without awareness that letters represent phonemes. Children do, however, create meaningful messages through their exploration. Prephonemic spelling is typical of preschoolers and beginning kindergartners. In the second phase, early phonemic spelling, the child is able to write some phonemes by using one or two letters for a word (e.g., **m** for **my** and **nt** for **night**). Early phonemic spelling is typical of many kindergarten and beginning first-grade students. In the third stage, letter-name, or phonetic spelling takes place, at which point the child uses letters for phonemes (e.g., **lik** for **like** and **brthr** for **brother**). The child represents most phonemes, understands the concept of a word, but is not quite reading yet. This is the point at which teachers find many ending kindergartners and beginning first-grade students. Transitional spelling occurs in the fourth stage. Here, students are

internalizing important clues about spelling patterns, and the words they write look like English words (e.g., **skool** for **school** and **happe** for **happy**). Although rules are applied, they are not always applied correctly. With reading and writing practice, students integrate more spelling rules and patterns. This stage usually includes first- through third-grade students. In the final stage, standard spelling occurs, at which point most words are spelled correctly. This usually takes place in the middle to the end of third grade or in fourth grade. Students learn to spell homonyms, contractions, and irregular spellings, as well as to begin to internalize the rules that govern more difficult vowel and consonant combinations, word endings, and prefixes and suffixes.

The two theoretical models, Gentry (1982a, 1982b, 2001, 2004) (based on initial research by Read (1971) and Routman (1994), are very similar except that Routman's developmental model subdivides the beginning stages into two additional stages of learning to spell.

Purposeful, systematic, explicit reading and spelling instruction in Standard English assists in the developmental process in important ways. Read (1971, 1975, 1986) argues that children's understanding of spelling is based on a set of implicit hypotheses about phonetic relationships and sound-spelling correspondences and that children are able to modify these hypotheses as they learn new spelling strategies. Frequently, characteristics of invented spelling change after Standard English spelling instruction, while some students continue to use invented spelling for several years before the final, correct spelling stage is mastered (Burns & Richgels, 1989; Ehri, 1987, 1986, 1994, 1995; Ehri, et al., 2001; Gentry, 2004; Richgels, 1995, 2001; Snow, et al., 1998). This may be true even though students may not have any special difficulty in adapting to

Standard English spelling; they simply take longer to be accurate spellers (Ehri, 1994, 1997; Ehri, et al., 2001; Richgels, 2001; Gentry, 2004). In addition, it is worth noting that although reading words and spelling words are interwoven and involve similar orthographic processes, more information and memory is required for correct spelling than for correct reading to occur (Ehri, 1994; Shaywitz, 2003; Snow, et. al., 1998). Ehri's (1997) research provided evidence, for example, that most students typically spell 80% of the letters but can only accurately spell 30 to 40% of an entire word.

Spelling development is certainly enhanced by allowing students to use invented spelling. As children learn to spell they go through a variety of stages (Ehri, 1991, 1994; Gentry, 2004; Henderson & Templeton, 1986; Martin, 2003; Nunes, et al., 1997; Read, 1971). In order to move through these stages and learn to use conventional speller, students must be allowed and encouraged to attempt a variety of spellings and make errors (Gentry, 1986a, 1986b, 2001, 2003; Read, 1971, 1986; Routman, 1994). It is through these approximations or trials (i.e., invented spellings) that children grow into conventional spellings.

Teachers should encourage temporary spelling in the appropriate context, but they should also teach spelling. For many children, temporary spelling alone is not enough (Gentry, 2000a, 2000b, 2004; Nunes, et al., 1997; Routman, 1996; 1997) children do need to be encouraged to use temporary spelling, at the same time, correct spelling needs to be taught (i.e., both skills should develop in tandem). Young children using invented spelling employ a considerably greater variety of words in their writing than those encouraged to use only the words they can spell correctly (Gunderson & Shapiro, 1987, 1988; Clarke, 1988; Stice & Bertrand, 1990). However, Krashen (1991) argues that for

third through sixth grade, it is not evident that spelling instruction has much of an effect on actual spelling accuracy beyond what is learned through reading alone, if children are reading extensively. Intermediate grades and high school students can benefit a great deal from spelling patterns and orthographical meanings of Latin and Greek roots and suffixes. Such learning is valuable for spelling and writing but perhaps even more valuable for vocabulary development and reading comprehension. In addition, extensive, repetitive exposure to print enhances the ability to recognize and remember the spellings and spelling patterns of particular words. As previously mentioned, both young and older students benefit from reading by practice when they reread their favorite books.

Consequently, teaching strategies for correcting spelling errors far exceeds the impact of simply providing the correct spelling of a word. Examples of strategies cited by Routman (1994) that teach students how to look for spelling patterns include: 1) writing the word two or three different ways and deciding which spelling looks correct, 2) locating the correct spelling in a familiar text or in print displayed in the classroom, 3) asking someone, 4) consulting a dictionary or thesaurus, 5) using a spelling checker on the computer, or 6) using a hand-held electronic spelling device (pp. 245-246).

For older students, spelling strategies and major spelling patterns can be taught much more effectively through short mini-lessons involving student discussion than through workbook pages or traditional spelling tests. Students can benefit especially when, as a group, they are guided in recognition of spelling patterns. Studying spelling lists is most useful if a limited number of words are selected for study. The idea is that if they are interested in these words, and the amount to learn is manageable, learning will more likely occur. At the end of the week, partners can test each other on the words they

each have practiced during the week. Individualized spelling dictionaries can be helpful as children are trying to get a grasp on the spellings of words. Teachers can make each child a booklet in which the child can enter words he or she is learning to spell. File boxes with index cards, or even computer files or databases for each child can serve the same purpose.

Also, by using invented spelling, children "expect their writing to make sense and have meaning" (Vacca et al., 1995, p. 79). Essentially, by enabling kids to practice invented spelling, we are letting them spell words like they sound, which is very helpful for students' writing—particularly in their early drafts. By not focusing on spelling every word correctly, students are able to be more creative with writing. On the other hand, when students feel that every word must be spelled correctly, "writing becomes a laborious undertaking rather than a meaning-making act" (Vacca et al., 1995, p. 81). Individual spelling patterns have recently gained interest in the research community largely due to a growing consensus that there is a common orthographic pattern that underlies each individual's encoding of words through spelling and their decoding of words during reading (Templeton & Morris, 2000). Recent research on the development of word knowledge supports this hypothesis (Ehri, 1997; Ganske, 1994; Gill, 1992; Invernizzi, 1992; Richgels, 1995, 2001). Several cognitive psychologists (Ehri, 1997; Gill, 1992; Perfetti, 1993) recommend giving students well-constructed spelling lists each week to ensure that spelling and reading use the same lexical representation. In fact, spelling is a good test of the quality of representation. Templeton (1992) believes that the way in which a reader spells an unfamiliar word while reading indicates the current orthographic knowledge the reader possess. Research indicates that children learn to

spell in a variety of ways: by 1) having many rich reading experiences that provide them with models of how words are spelled (Zutell, 1979), 2) trying out spelling using invented spellings (Read, 1971, 1986), 3) writing and proofreading (Personke & Knight, 1967), 4) selecting words for their own self-study (Wilde, 1991), and 5) teaching lessons, when needed, to focus on particular words or on a particular convention or pattern of spelling that may be causing problems in their writing (Gentry, 1986a, 1986b, 2004; Routman, 1994, 1996). Repeated opportunities to write are central for all of these activities to be successful over time (Wilde, 1990). Research shows that we learn to spell when proper spelling is important to us (Gentry 2000a, 2004; Marten, 2003, Templeton & Morris, 2000). Typically, spelling is best taught as part of the writing process. Students' spelling will improve when they are writing to audiences that matter to them and for purposes they care about. In these instances, students will be more likely to attend to spelling.

Invented/Temporary Spelling and Word-Learning

Many agree that like spelling, learning new words is a developmental process that develops in a series of phases (Adams, 1990; Chall, 1983; Ehri, 1994, 1995, 1998; Gough & Hillinger, 1980; Gough, Juel, & Griffith, 1992, Stahl & Murray, 1998). The first phase involves visual cues, which move on to what Ehri (1994) termed the “phonetic cue reading” or “partial alphabetic coding” stage. In this stage, initial letters serve as cues to recognize words or parts of words. The “full alphabetic coding” system follows, where students use all letters, sounds, and letter/sound correspondences to read words. In the final stage, also known as Ehri’s “consolidated word recognition” phase (Ehri, 1998) or

as the Gough, et al. (1992) “cipher reading stage,” automatic words retrieval is made possible by students’ stored lexicon or orthographic patterns.

Components of Integrated Spelling Instruction

In order to identify the components of integrated spelling instruction, we must first understand what an integrated spelling program entails. Routman (1994) describes an integrated spelling program as developmental spelling instruction which needs to be kept in the proper perspective. She states: “Invented spelling is not just tolerated; it is accepted and welcomed as a normal part of the process of becoming a competent speller” (p. 238). Goodman, Smith, Meredith, & Goodman (1987) believe there should not be any specific spelling curriculum or regular spelling lesson sequences in an integrated spelling program. Routman (1994) explains that an integrated spelling program should be based on “a whole language view of spelling, past teaching experiences, careful observations of students, and current research” (p. 240).

Teachers who are aware of the meaningful parts in words can teach students the reasons many words are spelled as they are. According to Bean and Bouffler (1988), “Standard spelling is the consequence of writing and reading, not the access to it...standard spelling is of little consequence if you do not write. Writing comes first!” (p. 47).

Effective Spelling Strategies

In an integrated spelling program, students learn to utilize spelling strategies and to use metacognitive (e.g., think aloud; thinking about their thinking) strategies to apply what they have learned in the process of writing. This approach has proven to be successful because most of the words occur in the normal context of reading and writing.

Visual memory, sound-symbol relationships, and morphemic (base word) cognition are developed implicitly and explicitly using several strategies. Routman (1994) cites “discovering the rules” as an effective strategy whereby the teacher teaches a five- to 10-minute mini-lesson based on similar spelling errors are made by several students (p. 240). Based on the limited usefulness of rules in commercial spelling series, Smith (1978) argues “The ‘rules’ of spelling can be numbered in hundreds and still carry only a 50% probability of being correct for any particular word” (p. 18). Additional strategies cited by Routman (1994) include applying the known to the unknown and having the teacher provide frequent opportunities for wide reading and writing so students practice writing a large number of words automatically as well as practice proofreading skills. Another strategy that can be used in an integrated spelling program is the use of a dictionary for students to use to combine vocabulary study with etymology and grammar (Routman, 1994).

An awareness of spelling development can help teachers plan instruction. For precommunicative and semi-phonetic spellers, teachers may teach the alphabetic principle, letter-sound correspondences, concepts of print, and left-to-right directionality. At the phonetic stage, students might be introduced, in the context of writing, to word families, spelling patterns, phonics, and word structures (Gentry, 1982a, 1982b, 2004). He argues for purposeful writing to facilitate cognitive growth in spelling. Teachers can encourage purposeful writing, such as the writing of messages, lists, plans, signs, letters, stories, songs, and poems. Teachers can also provide opportunities for frequent writing, which, when integrated with all aspects of the curriculum, should be a natural part of the daily classroom routine (Routman, 1997). Frequent application of spelling knowledge by

students while writing encourages spelling competency. During the English Language Arts block, teachers should avoid overemphasis on absolute correctness, mechanics, and memorization for writing assignments. Early emphasis on mechanical aspects of spelling inhibits developmental growth. When frequent purposeful writing takes precedence, adherence to the rules is secondary. The teacher in no sense abandons expectations for correctness. Rather, correctness is nurtured more effectively through knowledge of the student's level of development.

Farstrup (2002) urges teachers to make use of instructional games since children acquire language, in large part, from their alertness to language around them. Hodges (1981) points out that language games can be used to enhance the young child's growing awareness of words and how they are spelled. In *Learning to Spell*, Hodges (1981) presents games that involve exploring sound and letter relationships, manipulating letters to form words, building words, alphabetizing, and using the dictionary. If schools are to integrate language development and writing in spelling programs, teachers and parents must provide support for purposeful integrated spelling instruction rather than conducting rule-based instruction or relying on memorization. Students' invented spellings must be seen as opportunities for them to contribute actively to their own learning. By combining an understanding of invented spelling with formal spelling instruction, teachers should be able to develop more effective spelling programs.

Many proven strategies that promote developmental spelling patterns across the various stages exist (Gentry, 1978, 1982a, 1982b, 2000a, 2000b, 2001, 2004; Marten, 2003, Nunes, et al., 1997). Teachers can provide a print-rich environment and ample opportunities to read, write, and reread. As a result, spelling, reading, and writing skills

improve. Peer tutoring, intervention lessons, creative writing centers, personal dictionaries, wall charts (including sound and word walls) are just a few suggestions to enrich a student's spelling knowledge. As students progress and mature, spelling games can be introduced that are teacher-made or purchased commercially in print or electronic form. Routman (1994) specifically endorses the use of "have a go" spelling sheets," which were adapted from Australia (Parry & Hornsby, 1988, p. 61). Students write words that were misspelled in their daily writing and attempt to "have a go" at spelling those words correctly. The teacher or peers tutor the student to aid in understanding the basic orthography of the words misspelled. Then the student practices writing the word several different ways to see which spelling "looks" right (Routman, 1994, p. 244). Many other interventions promote spelling fluency, including frequent ongoing parental involvement for each student by showing parents the connection between reading, writing, and spelling.

Summary

There has been a backlash in many school districts where parents are now making demands for spelling and phonics instruction (Gentry 2004; NFP, 2000; Snow, et al., 1998). Research tells us that a child does not naturally learn to read, write, or spell (Adams, 1990, Farstrup, 2002; Gough & Hillinger, 1980; NRP, 2000, Snow, et al., 1998). Since spelling is directly connected to phonemic awareness, and phonics, a high-quality, purposeful integrated spelling, reading, and writing instruction is critical during the Language Arts instructional block. Furthermore, integrated spelling, reading, and writing instruction must be individualized, with ample opportunities for practice, progress monitoring, and intervention, as needed. Since spelling cuts across the curriculum, it

should be connected to writing and reading, both of which, include phonics. However, teaching phonics solely in isolation is questionable. The goal of an integrated spelling program should be to develop writers and readers who have spelling consciousness and good spelling habits.

Researchers encourage us to observe classrooms for evidence of integrated spelling instruction by looking for students actively engaged in finding words, inspecting words, mastering words, and developing good spelling habits (Farstrup, 2002, Gentry, 2004, Routman, 1994, 1996). Moats (2000) argues, “Just as a physician must study anatomy to understand physical functioning, so must we know the linguistic structure that supports communication” (p. 15). Therefore, unfamiliar words should be incorporated into creative writing and reading assignments until the student becomes comfortable with beginning to conquer the spelling of the new word by first looking at patterns and other orthographical cues. In a frequently cited article on this topic, an eminent reading researcher, Stanovich (1994), stresses the critical importance of spelling for emergent literacy by arguing for “appropriately chosen direct instruction in the spelling-sound code.” (p. 287). Therefore, while teaching spelling is only a small part of literacy instruction, it is a necessary, though not sufficient, aspect of learning to read. This means an instructional focus on spelling is important.

Therefore, elementary, middle, high school, and higher education teachers should incorporate their foundational knowledge about the linguistic nature of reading, knowledge of how orthography biases our perceptions, and a good reading method to guide students during the teaching process. Linguistic knowledge supports teachers in helping their students 1) gain experience with phonemic awareness before learning to

read (Adams, 1990, NRP, 2000, Snow, et al., 1998), 2) make regular letter-sound correspondences in incremental steps (Hall & Moats, 1998; Moats, 2000; NRP, 2000), 3) apply orthographic word images of regular and irregularly spelled words (Ehri, 1994, 1995, 1997; Ehri & Saltmarsh, 1995), and (4) apply the transparency of word derivations (Henry, 1988).

Educators must address students' language deficits, which can be improved by careful analysis of the types of spelling errors they make. Therefore, based on the research discussed, steps should be taken to ensure that reading, writing, and spelling are taught together, rather than as separate, isolated subjects during the Language Arts block. Furthermore, such instruction should not be less than 90 minutes of uninterrupted instructional time on a regular basis, with emphasis on flexible small group instruction. Intervention groups should be established and monitored every two weeks to ensure each individual student's needs are being met. Frequent, ongoing progress monitoring will help ensure that students who no longer need to be in intervention situations are removed from them, while others needing more intensive strategic skills-specific intervention are placed accordingly.

Finally, if we are to integrate language development and writing in spelling programs for all levels of education, teachers, parents, and the community must provide support for purposeful, integrated spelling instruction rather than conducting rule-based instruction or teaching students to rely on memorization. Students' invented spellings must be seen as opportunities for individuals to contribute actively to their own learning.

CHAPTER 3

MATERIALS AND METHODS

Introduction

The primary purpose of the quantitative study was to investigate the utility of temporary orthographical representations via temporary spelling patterns in emergent literacy instruction following student participation. As in the Richgels (1986a, 1986b, 1995) study in which correlations revealed that kindergarten students' alphabetic knowledge was related to invented spelling and beginning reading ability, this correlational study reviewed, applied, and analyzed the impact of temporary spelling patterns on emergent literacy with implications for instruction. Research suggests that positive correlations exist between invented spelling patterns and learning to read words in kindergarten Language Arts instructional settings (Burns & Richgels, 1989; Ehri, 1998, 2001; Ehri & Wilce, 1985, 1987; Gentry, 2000a, 2001; Richgels, 1986a, 1986b, 1995, 2001). These correlations, if accurate, have important instructional implications for students, teachers, and policy makers because these orthographic representations produced in writing samples during spelling, reading, and/or writing instruction provide valuable assessment information about where particular students are in becoming literate citizens.

Power Analysis to Determine Sample Size

In order to make a make a valid decision in determining an adequate sample size for this study, the researcher reviewed the sample sizes of 16 studies on invented spelling and their correlation to beginning reading. The power analysis revealed a population correlation (Rho) of 0.50 with Type I error value or alpha level set at 0.05. As a result,

the power analysis revealed that an average sample size of 37 participants would be necessary to make a valid sample for this correlational study of spelling tasks and beginning reading as measured by DIBELS.

Selection of Setting

Before any research was conducted, the researcher took an online Clinical Research Training course for conducting research with human subjects, offered through the National Institute of Health. After receiving a notification of a passing score from the National Institute of Health, the study officially began. Following an application for exemption from oversight of the Institutional Review Board (IRB) of the university, a letter requesting permission to conduct the study in a rural school district was hand delivered mailed to the district school superintendent for curriculum and instruction. Once permission was granted, the researcher selected one rural public school with seven kindergarten classrooms housed in the same school. The researcher scheduled in advance an appointment with the principal and lead kindergarten teacher at the school to discuss the study and timeline involved.

Selection of Participants

The participants for the study included all kindergarten students (n =117) enrolled at a rural elementary public school with seven kindergarten classrooms. The researcher scheduled a meeting with the principal, lead kindergarten teacher, school testing coordinator and other kindergarten teachers to discuss the objectives of the study, tasks students would be asked to complete, how assessment data would be used for the study, timeline, and content and procedures for distributing and collecting Child Consent Forms. With the permission of the administration, seven sets of Child Consent Forms were

distributed stapled to a parent letter for each student enrolled in the seven kindergarten classes at the school. Teachers were given stickers to reward students who returned signed Child Consent Forms. A time period of one week (i.e., seven days) was established for returning the Child Consent Forms. Upon receipt of all signed Child Consent forms, a thank you letter was sent to all parents who granted permission for their child(ren) to participate in the study. It was interesting to note that two sets of identical twins were included in this study: two identical boys and two identical girls.

Before any research was conducted, the researcher gathered all Child Consent Forms from the lead teacher. A list of participants was made for each classroom using the teacher's name as the identifier. Only those that returned the signed Child Consent forms within a one-week period participated in the temporary spelling and word-learning tasks for this research study. During task assessment, the researcher checked each Child Consent Form to make sure the parent and child had signed the form. On some occasions, the child was asked to sign if they had not done so. A total of 95 forms were returned; however, there were 93 participants in the study. One form was a duplicate, and one parent signed permission to participate in the study, but wrote a note on the form refusing to allow the child to sign consent, making that student ineligible to participate in the study. The researcher has maintained the Child Consent Forms, assessment information, and task scoring sheets on file for each participant. Upon completion of the study, a letter of appreciation was sent home to all parents who signed the Child Consent Form for their child(ren) to participate in the study. The teachers, principal, school testing coordinator, and district superintendent were also thanked for their contributions and assistance with the study.

Participants varied based on their demographic information (e.g., free/reduced lunch, and age) and assessment data (e.g., *Dynamic Indicators of Basic Early Literacy Skills*, mid-year benchmark). Of the 117 students, 93 participated in the study. Ninety-five consent forms were returned, with one as a duplicate, and the other voided due to parent's note refusing permission for child to sign consent form. Therefore, a total 93 students participated in the study.

No special accommodations were made for any student. All participants (i.e., students) completed the same tasks in the same order and sequence. The researcher collected and has maintained a file on the assessment data for each student using extant data from the School Testing Coordinator (STC).

Research Design

Phase 1: Participant Selection Process

All 117 students were asked to participate in the study, but were required to have a Child Consent Form signed by the parent and the child. Each child enrolled in kindergarten was given a Child Consent Form and a parent letter explaining the study and time involved outside of the classroom. Seven days were reserved for students to return the signed consent forms and ask any questions regarding the study. The kindergarten students were given stickers as a reward for those that returned the signed consent forms. After a week's time, the lead kindergarten teacher collected the forms, upon which the researcher placed in alphabetical order by each teacher's name on the DIBELS Data Collection Sheets, prepared by the researcher.

Phase 2: Invented/Temporary Spelling Task

The second phase of the study involved an analysis of invented/temporary spelling patterns in which all participants were presented with one set of plastic, magnetic uppercase letters arranged in alphabetical order in three rows on a 30-inch by 24-inch magnetic board. The additional letters D, E, I, N, O, P, R, S, and T were arranged on the magnetic board as the fourth row. Ten picture cards representing 10 words were made available in the same order and sequence for each student (e.g., **nose, feet, table, pie, bird, nest, bridge, sock, drum, and wagon**). The researcher used a prepared scoring sheet for each student to record student responses (i.e., temporary spellings) for each of the 10 words). The 10 words used in the study were the same 10 words used in the Burns (1986) and Burns & Richgels (1989) study, which were chosen for several reasons. First of all, the researchers wanted to use a list of words that could be represented by pictures, and easily recognized by most five-to-six-year-olds (i.e., with little assistance from adults). Representative sample of short vowel, long vowel, single consonant sounds, as well as initial and final consonant blends were present in the 10 words selected. Another reason these 10 words were selected for the study was because Burns (1986) validated the appropriateness of the 10 words by testing them with panel members. Each panel member was presented 20 words and asked to use those words to answer the following questions: 1) Could the word be represented by a picture?; 2) Could a four-year-old immediately identify the picture?; and 3) Does the word contain two to five of the above mentioned sounds? All 20 words were composed of the 10 stimulus words, one (nonstimulus) word that met all three requirements, four words that could not be represented by a picture, three words that a four-year-old would find difficult to identify,

and two words that contained more than five sounds. Nine words were eliminated based on an analysis of the review panel comments. Table 2 illustrates consensus among panel members regarding the 10 nouns selected for the Burns (1986), Burns & Richgels (1989), and the present study. A reliability coefficient of .99 was determined when the task was administered to 39 four-year olds and Cronbach's alpha was applied to examine the internal consistency of the 10 words.

Table 2. Invented spelling task: Agreement among panel members for words in Burns (1986) study.

Words	Agreement Among Panel Members
1. Pie	100%
2. Feet	100%
3. Bird	100%
4. Sock	100%
5. Nest	100%
6. Wagon	100%
7. Table	100%
8. Nose	89%
9. Drum	89%
10. Bridge	78%

For each of the 10 picture cards, the student was asked to recite the name of the picture aloud and use the magnetic letters to write that word on the magnetic letter board. Students were encouraged by the researcher to produce what they considered a good

spelling, even when it might not be the way that a grown-up would spell the word (e.g., “Now I want you to move the letters to your magnetic board and use the letters the way you think would be a good way to spell ____.” The researcher used a scoring sheet to copy each student’s spelling, with a total of 35 points attainable for credited spellings of 35 essential phonemes in the 10 words. Raw scores were recorded and compared for analysis. As in the Richgels (1995) study, credited spellings included were consistent with Read’s (1971) analyses of temporary spellings. This study incorporated the work of Burns (1986) and Burns and Richgels (1989) that provided complete descriptions of the task and scoring criteria and report coefficients of .99 and .98 in two separate tests of the spelling task’s reliability.

Phase 3: Word-Learning Task

During the third and final phase of the study, each participant was asked to match two sets of phonetically simplified words, presented on two consecutive school days. The purpose of this task was to assess printed word-learning, which was a modification of research conducted by Ehri (1997), Ehri and Wilce (1987) and Richgels (1987, 1995). Using this task as an identifying factor of student word-learning ability was consistent with Scott and Ehri’s (1990) proposal that simplified word spellings play an important role in early literacy instruction:

Teaching beginners to read phonetically sensible spellings when they first move into reading not only makes word reading easier for them but also enables them to use what they know about letters to make sense of the spelling system. (p. 164)

Six nouns with accompanying pictures was used for two sets of words for the printed word learning task, which is consistent with previous early literacy acquisition studies (Ehri, 1983, 1986, 1989, 1994, 1997, 2001; Ehri & Wilce, 1985; 1987; Scott & Ehri, 1990; Richgels, 1995, 2001). The six words were selected from easier three-letter words, which were used in the second phase of the study. Each word contained only three letters to ensure that the focus was on the task of simple word-learning without having the length of the word interfere with that ability. As in the Richgels' study (1995), the invented spelling for the six simple words used for this study included: PNO for piano, PKJ for package, TEM for team, NDN for Indian, NRS for nurse, and TUB for tub. In order to avoid having TUB misread by the subject, the three-letter spelling of tub was paired with the three-letter spelling of team (TEM). The reason this was done was because **tub** may be spelled by some participants as TOB rather than TUB. Although Richgels (1995) did not report any instances where this occurred, he

“.... make[s] no claim that the simplified spellings used here are children's actual invented spellings; they are simplified spellings which are designed with consideration of invented spelling difficulty factors, such as the number of syllables and sorts of vowels (e.g., long vowels being easier than nonlong vowels).” (p. 109)

The same assumption was made in this study regarding the use of the temporary spelling TUB for **tub** as in the Richgels (1995) study.

Six additional nouns of more difficulty were also included in this study. Consistent with the Richgels (1995) study, each word contained two to three syllables with seven to eight letters, and included various vowel combinations. The six words

included: **parakeet**, which contained a schwa-sounded vowel; **newspaper**, which contained a glided, long /e/ and a long /oo/ combination; **placemat**, which contained a long /a/ and a short /a/ in the same word; **telephone**, which contained the long/o/ and silent -e combination; **tambourine**, which contained the short /a/ even though the word ended in -e, along with the /ou/ vowel combination, and an r-controlled vowel pair /ri/; and **nutcracker**, which contained a short /u/, short /a/, and an r-controlled vowel pair /er/. The temporary spellings for **parakeet** were PARAKET; NEWZPAPR for **newspaper**; PLASMAT for **placemat**; TELEFON for **telephone**; TAMBREN for **tambourine**; and NUTKRAKER for **nutcracker**.

All 12 words (e.g., 6 easy words and 6 more difficult words) were represented by their temporary spelling on a 5-inch x 8-inch index card using all uppercase letters, approximately two inches tall. Twelve word cards were made with accompanying picture cards, using the same size cards and letter sizes.

On Day 1, a test trial for all 12 of the words was conducted before the actual assessment began. For the test trial, the researcher modeled the oral and physical matching of each word card with its corresponding picture card for each set of words. As each pair of cards was presented, the researcher pointed to the invented spelling and pronounced the word aloud. The participant orally repeated each the word afterwards and pointed to the picture card. The procedure was repeated for both sets of word/picture card pairs in the same sequence for all participants. After completion of the two sets of word/card pair trials, the researcher returned to all 12 word and picture cards (e.g., 6 easy words and 6 more difficult words), to conduct the third and final phase of this study. After the test trial, the participant was allowed seven trials to correctly match the 12

word/picture cards and orally produce the words as modeled by the researcher and practiced in the test trial. When all 12 words were recited and matched correctly, a criterion score of seven was recorded on the scoring sheet. However, if after seven unsuccessful matching of all 12 word/card pairs, the task was ended and a score of zero was recorded on the scoring sheet. The same procedure was repeated for Day 2, with the exception of the test trial. Participants orally produced each word as it was matched to its corresponding picture card. The researcher circled any incorrect matches on a Criterion Score Sheet so that a numerical score was assigned for each participant on both days of task completion for comparison purposes. As on Day 1, a criterion score of seven was recorded when all 12 word/card pairs were matched and spoken correctly on the first attempt; a criterion score of six was given when all 12 word/card pairs were matched and spoken correctly on the second attempt, with this pattern of scoring continued until a criterion score of zero was assigned when none of the word/card pairs were matched and spoken correctly.

Data Collection and Analysis

Data analysis was conducted to answer the following research questions:

1) Is there a statistically significant relationship between invented spelling as displayed in task and beginning reading skills as measured by DIBELS?

(2) Does the performance displayed in task and beginning reading skills as measured by DIBELS differ significantly for boys and girls in kindergarten?

Phase 1: DIBELS Data Collection Procedures

The researcher used extant data for all DIBELS screening measures by viewing each individual booklet for each student who returned a signed consent form. A DIBELS

Data Collection form was prepared by the researcher to record data in an efficient manner, listing students by teacher name first, then each subskill of DIBELS (i.e., Letter Naming Fluency, Initial Sound Fluency, Phoneme Segmentation Fluency, and Nonsense Word Fluency) so that the individual numerical DIBELS scores could be recorded. Students were then pulled out of the classroom during the school day and taken to a quiet location to individually complete the temporary spelling and word-learning tasks. The location chosen was a vacant classroom typically used by the speech therapist, who graciously moved to another location in order for the researcher to conduct this research in a quiet environment away from the kindergarten classroom.

DIBELS data was used for analysis because it was the measure chosen by the school site. In addition, research has proven the predictive value of DIBELS in future reading success (Good & Kaminski, 2002). The DIBELS is a set of pre-reading assessments that screen phonological awareness and alphabetic understanding (Kaminski & Good, 2002). The DIBELS was selected as a screening device for this study based on the evidence that has emerged linking phonological awareness and reading acquisition (Adams, 1990; Lundberg, Frost, & Peterson, 1988; Vellutino et al., 1996). According to the authors (Good & Kaminski, 1996), the DIBELS can be used to answer questions such as: (a) Which children are at risk for reading difficulty because of inadequate phonological awareness skills? (b) Which children need additional instruction in phonological awareness skills? (c) Is the current instruction effective in increasing phonological awareness skills? and (d) When has a child developed phonological awareness skills to a degree that is no longer indicative of difficulty learning to read? (Hintze, et al., direct correspondence, p. 4)

The scores on the subtests of DIBELS for kindergarten used in this study were Initial Sound Fluency (ISF), Letter Naming Fluency (LNF), Phoneme Segmentation Fluency (PSF), and Nonsense Word Fluency (NWF). All subtests were individually administered standardized instruments.

DIBELS Initial Sound Fluency (ISF) measures a child's ability to recognize and produce the initial sound in an orally presented word (Good & Kaminski, 1996, 1998). ISF requires the student to identify from four pictures on each page, the word that begins with a target sound. For example, the assessor would say to the student: "This is a sink, cat, pillow, and a ball. What picture begins with /s/?" This procedure is repeated for three of the 4 pictures on the page. For the last picture, the assessor asks the student, "What sound does **ball** begin with?" The amount of time the child requires to identify and produce the correct sound is calculated and converted into a score of that represents the number of correct onsets per minutes. The original measure of ISF in DIBELS was termed Onset Recognition Fluency (OnRF), whose established reliability and validity was incorporated into the DIBELS-ISF measure with minimal revisions (Good & Kaminski, 2002). The adequate reliability has been established for OnRF at .72 in January of the kindergarten year, and increasing to .91 after repeating the assessment four times. The concurrent validity of OnRF in January of the kindergarten year is .36 with the *Woodcock-Johnson Psycho-Educational Battery* readiness cluster score and .48 with the DIBELS Phoneme Segmentation Fluency (PSF) measure in January of the kindergarten year. The predictive validity of ISF for spring of first grade reading on *Curriculum Based Measurement (CBM) ORF* is .45 and .36 with the *Woodcock-Johnson Psycho-Educational Battery-Revised* total reading cluster score (Good et al., in

preparation). [Note: CBM ORF is a standardized procedure used to measure accuracy and fluency with connected text. A version of CBM ORF has been published as *The Test of Reading Fluency* (TORF) by Children's Educational Services, 1987.] There are a total of 16 items on each probe, in 20 alternate forms with alternate-form reliability of .72 (Good, Kaminski, Simmons, & Kame-enui, 2001). Concurrent validity of ISF with the *Woodcock-Johnson Psycho-Educational Battery-Revised* total reading cluster score is .36, and the correlation is the same for predictive validity one year later (Good, et al., 2001).

DIBELS Phoneme Segmentation Fluency (PSF) is administered orally and has proven to be a good predictor of future reading success (Kaminski & Good, 1996). PSF measures the ability to segment three- and four-phoneme words into their individual phonemes fluently. It is administered beginning at the midpoint of the kindergarten year through the middle of the first-grade year. On the PSF, the student is asked to speak the phonemes for each word recited by the assessor. For example, the assessor may say, "Tell me all the sounds you hear in cat." The student should reply: "/c/, /a/, /t/" to receive three possible points for that task. The two-week, alternate-form reliability is .79 in May of the kindergarten year (Good et al., in preparation). Concurrent criterion validity of PSF is .54, with (a) winter of the first-grade year DIBELS NWF at .62, (b) spring of the first-grade year *Woodcock-Johnson Psycho Educational Battery* total reading cluster at .68, and (c) spring of the first-grade year CBM ORF at .62 (Good, et al., 2001).

DIBELS Nonsense Word Fluency (NWF), measures student understanding of the alphabetic principle, which includes the letter-sound correspondences and the ability to blend letters into words (Kaminski & Good, 1996). The student is given one minute to

sound out as many letter-sound correspondences (either individually or as nonsense words) as possible from an 8.5-inch x 11-inch sheet of random vowel-consonant (VC) and consonant-vowel-consonant (CVC) combinations (e.g., **sim**, **lut**, **vej**). As with PSF, one point is given for each phoneme produced by the student. Students receive higher scores if they are recoding phonologically because the measure is fluency based. Student scores will be lower if each phoneme is sounded out individually. The one-month, alternate-form reliability of NWF for January of the first-grade year is .83 (Good et al., in preparation). The concurrent criterion-validity of NWF with the *Woodcock-Johnson Psycho-Educational Battery-Revised* readiness cluster score is .36 in January and .59 in February of the first-grade year (Good et al., in preparation). The predictive validity of NWF in January of the first-grade year with: a) CBM ORF in May of the first-grade year is .82, b) CBM ORF in May of the second-grade year is .60, and c) *Woodcock-Johnson Psycho-Educational Battery-Revised* total readiness cluster score is .66 (Good, et al., 2001).

DIBELS Letter Naming Fluency (LNF) presents upper- and lower-case letters arranged randomly where students are asked to name as many letters as possible in one minute. Students are told letters they do not know. The score is the number of letters named correctly in one minute. The one-month, alternate form reliability of LNF is .93 in kindergarten (Good, et al., 2001). The concurrent validity with the *Woodcock-Johnson Psycho-Educational Battery-Revised* readiness cluster standard score is .70 in kindergarten. The predictive validity of kindergarten spring LNF scores with first grade *Woodcock Johnson Psycho-Educational Battery-Revised* reading cluster score is .65 and .71 with first-grade CBM reading (Good, et al., 2001).

Participants were classified as on-level if all four the DIBELS measures were at mid-year benchmark status for kindergarten, as determined by the *Dynamic Indicators of Basic Early Literacy Skills Benchmark for Kindergarten*. Participants were classified as low-performing if one or more of the DIBELS measures were below mid-year benchmark DIBELS status for kindergarten. Based on the data collected, the researcher coded the participant as Low-Performing or On-Level status on the scoring sheets for both tasks.

Phase 2: Invented/Temporary Spelling Patterns and Readability Assessment

One set of word/picture cards with corresponding picture cards were used to assess temporary spelling and readability patterns for all participants. The words used for the task were: **nose, feet, table, pie, bird, nest, bridge, sock, drum, and wagon.**

Participants were asked to spell each word the best they could using one complete set of the alphabet arranged in three rows. A fourth row contained the additional letters D, E, I, N, O, P, R, S, and T. A score sheet was prepared by the researcher to record correct responses so that a raw score (i.e., points) could be assigned for each day the task was completed for each participant. Means and standard deviations were computed to show the variations between the performance of on-level and low-performing participants as well as variations between the performances of male and female participants. A possible raw score of 35 was attainable due to the 35 produced within the 10 words presented in the temporary spelling tasks.

Phase 3: Word-Learning Assessment

As in the Richgels (1995) study, means and standard deviations of criterion scores were calculated in order to report any statistically significant correlations between on-level and low-performing participants and between male and female participants with

both easy and difficult words. Recall scores were calculated for on-level and low-performing students as well as for gender to show the number of words correctly identified at the beginning of Day 2 in the single recall trial using Day 1 words. Means and standard deviations of the recall scores were calculated along with T-tests to show the comparisons among on-level and low-performing groups' performance and variations between male and female participants on word-learning tasks.

Summary

This research study analyzed experimental data derived from 93 kindergarten students' participation in temporary spelling and word-learning tasks. Although all participants performed the same tasks, some were currently performing on-level for early literacy skills acquisition and word-learning, whereas others were below level for early literacy skills acquisition and word-learning. The determination of current benchmark status was made using the DIBELS as the screening measure.

Tasks included temporary spelling and word-learning activities that were printed on two sets of word cards with different levels of complexity along with corresponding picture cards. Means and standard deviations were calculated to report central tendencies among participants' performance based on DIBELS data and gender. T-tests were calculated to illustrate any significant correlations that existed between the varied groups in both tasks. It was the intent of the researcher to provide insight into the role of spelling in teaching children to read.

CHAPTER 4

RESULTS

Chapter four provides a summary of the results of the present study. First, demographic information will be reported, followed by an overview of the statistical results relative to the research questions regarding participants' task completion and performance. A comparison of how low-performing participants performed in relation to on-level participants on temporary spelling and word-learning tasks will be discussed. Finally, a comparison of how boys performed in relation to girls will be reported, as well as overall performance on the temporary spelling patterns and word-learning performance of kindergarten students as a whole.

Fidelity of Administration

All tasks were completed in the same order and sequence for all students. No special accommodations were provided. All participants completed the same tasks using the same materials. An unbiased observer used a prepared checklist to observe testing on a random basis (see Appendix C).

Initial Analyses

Descriptive Statistics of the Setting

The K-2 public school selected for this study was located in a rural community in the southern United States. The school district that supervised the school in this study managed a total of 11 schools with 3,681 students. The agency's total revenue is approximately \$20,800,000, which represents an average of \$5,635 expended for each student in the school district.

The rural community where the school was located had an approximate population of 3,724 residents, with the average resident being 35 years of age. The average household size for the rural community was 2.8 persons, with a median household income of \$40,800 per year. Most of the residents were homeowners (81%), with the median value of housing being \$85,200. The median age of the housing structures in the rural community was 30 years of age, with an average of 5.4 rooms.

There were 26 teachers at the school, with a ratio of one teacher for every 15 students. All of the kindergarten teachers were certified, ranging in age from 25 to 53 years of age. The state's department of education reported 96% of core courses at the school were taught by highly qualified teachers. (According to the state's definition, core courses included English, mathematics, science, social studies, foreign languages, and the arts.) At the time of the study, the school was performing as a school in decline based on the state's accountability system ranking.

There were 378 total students enrolled in the school: 128 in kindergarten, 120 in first grade, and 130 in second grade. Inclusive of this population were 45 students with disabilities, including those with speech and language impairments. The majority of students in the school (53%) were male, coming predominately from Caucasian households (56%). Forty-four percent of K-2 students were from African American households, with 1% being from Hispanic households. Fifty-four percent of the total school's population was eligible to receive free or reduced lunch. One percent of the school's population was migrant students, which was the same as the state's average.

Descriptive Statistics of the Participants

Descriptive statistics for the demographic data are presented in Table 3. The total number of participants in the study included 93 kindergarten students enrolled in a public K-2 school with seven kindergarten classes. The majority of the participants (52%) were male (n=48). The female students in the study accounted for 48% of the sample (n=45). Students ranged in age from six to seven years of age, with a mean age of six years three months. Of the participants, 43% (n=40) received free or reduced lunch. Over half (51%) of the participants scored below benchmark status on the *Dynamic Indicators of Basic Early Literacy Skills* at midyear (n=47), which indicates low-performing students on the literacy skills which can be used to predict problems for future reading success.

Table 3. Participant gender, free/reduced lunch, and DIBELS benchmark at midyear.

	Number (n=93)	Percent
Male Students	48	52
Female Students	45	48
Free/Reduced Lunch Students	40	43
DIBELS: Below Benchmark	47	51

Invented/Temporary Spelling Tasks

When participants were asked to generate words using magnetic letters on a magnetic letter board, various temporary spelling patterns emerged that were consistent with the research of Ehri (1995, 1998, 2001), Ehri and Wilce (1985, 1987), and Richgels (1995, 2001). As in the Richgels' (1995) study, 10 words were orally presented by the researcher with an accompanying picture card (i.e., **nose, feet, table, pie, bird, nest, bridge, sock, drum, and wagon**). Participants were asked to spell each word the best

they could using one complete set of the alphabet arranged in three rows. A fourth row contained the additional letters D, E, I, N, O, P, R, S, and T. Of the ten words, 55% of participants (n=51) correctly spelled **nest**, 24% (n=22) correctly spelled **feet**, 18% (n=17) correctly spelled **pie**, 14% (n=13) correctly spelled **bird**, 12% correctly spelled **drum**, 11% correctly spelled **sock**, 7% correctly spelled **nose**, 4% correctly spelled **table**, and only 1% (n=1) correctly spelled **wagon**. None of the 93 participants were able to correctly spell **bridge**.

Individual Invented/Temporary Spelling Word Analysis

The word **nest** yielded 19 different invented/temporary spellings, with the most common being the correct spelling (n=51), followed by NES (n=16), NET (n=5), NST and NS (n=3), and NAST (n = 2). Individual participants constructed the following temporary spellings of **nest**: NUS, NETS, NT, NEEG, NAD, NCT, NSR, NESR, NESU, NAT, NIST, SNT, and VET. These individual invented spellings revealed an awareness of initial consonants, but lacked the phonological awareness and phonics skills required to accurately spell the ending consonant blend **-st** and the medial vowel **-e**.

Fourteen invented/temporary spellings were recorded for **feet**, with 60% of participants (n=55) creating FET as the temporary spelling for **feet**. Twenty-two participants accurately spelled **feet**, which represented 24% of participants, followed by 3% that spelled **feet** as FT (n=3) or FIT (n=3). Individual temporary spellings constructed for the word **feet** were: FEED, FES, FETS, FETT, FENT, FEEU, FED, FEIT, FETI, and FYT, which indicated an awareness of the initial consonant sound /f/ in **feet**. However, phonemic awareness was lacking the accurate identification of ending consonants (i.e., /t/) and medial vowel sounds (i.e., long /e/).

Although **pie** is a small word, 22 invented/temporary spellings were constructed, with PIY being the most frequent response (n=23), followed by the correct spelling (n=17), POY (n=15), PI (n=12), PIU (n=5), PY (n=2), PIL (n=2), POI (n=2), and PIG (n=2). Participants also spelled **pie** as: PAE, PEY, PYE, PIEE, POE, POIE, PEE, POL, PIQ, PIS, PIT, PLI, and NIP. Individual temporary spellings of **pie** suggested that participants were aware of the beginning consonant and the placement of the letter **I** in the word. However, these participants lacked awareness of medial vowel sounds. The researcher noted that when participants placed the letter **Y** on the magnetic board to spell **pie**, they all pronounced the long /i/ sound for the letter **Y**, which indicates an awareness of how the letter **Y** may function as a vowel (i.e., long /i/).

There were 21 invented/temporary spellings of the word **bird**. Fifty-nine percent (n=55) of participants spelled **bird** as BRD, followed by 14% (n=13) who correctly spelled **bird**. Three percent of participants spelled **bird** as BD (n=3), BRT (n=3), or DRD (n=3), followed by a wide random list of temporary spellings, including: BIRDE, BID, BIYD, BED, BERD, BUD, BURD, BRID, BRUD, BRLD, BRU, BRDY, BRDID, BORD, PBR, and TEB. Once again, the random individual temporary spellings revealed an awareness of initial consonants most of the time, but exhibited a lack of understanding of ending consonants and medial vowel sounds.

Of the 10 words presented for the invented/temporary spelling tasks, the word **drum** produced the most temporary spellings (n=37), closely followed by **bridge** (n=36). The most frequent temporary spelling of **drum** was equally split between JRUM and JUM (n=17), which represented only 18% of the participants, followed by the correct spelling of **drum** (n=11), GRUM (n=4), JRAM and JOM (n=3), and GAM (n=2). After

these two temporary spelling patterns were noted, a variety of initial consonants were used among the remainder of participants, including the letters **D**, **J**, **G**, **M**, and **R**. Individual temporary spellings of **drum** included: DOM, DRUME, DM, DRM, DROM, DRAM, JROOM, JOROM, JM, JRO, JER, JUB, JIM, JAM, JOMK, JROM, JMO, JRM, JYM, JRU, GROM, GOM, GOG, GM, HROM, LUM, MD, MS, OYT, and ROM. It was noted, however, that most of the random individual temporary spellings of **drum** (n=89) had the correct final consonant ending /m/.

Participants produced the least number (n=16) of different invented/temporary spellings for the word **sock**. Thirty-seven percent (n=34) of participants created the temporary spelling of SOC for **sock**, followed closely with the temporary spelling of SOK for 34% (n=32) of participants. Eleven percent (n=10) spelled **sock** correctly, followed by only 2% (n=2) who constructed the word SIK for **sock**. Individual temporary spellings of **sock** produced a diverse representation including: SOCKE, SOKC, SAQ, SO, SIC, SROK, SOKE, SOT, SICK, SOQ, KS, and WRS. Recognizable orthographic patterns included the initial consonant sound /s/ with and the ending consonant sound /k/ with less clarity on participants' awareness of ending consonant sound /k/ and the short medial vowel sound /o/.

Participants created 23 invented/temporary spellings for the word **nose**, with NOS being the most common spelling (n=50), followed by NOZ (n=14). Six percent (n=6) correctly spelled **nose**, followed by 3% who spelled **nose** as NO (n=3), 2% who spelled **nose** as NOOS (N=2), NOOZ (n=2), and NOW (n=2), and only 1% constructed **nose** using the letters NOSZ (n=1), NUZ (n=1), NOIS (n=1), and NUS (n=1). The wide variation in temporary spellings of **nose** included: NOST, NOSP, NUVS, NOWS, NOW,

NOV, NOOSS, NOZI, KNOS, ON, UOS, and UDESOP. It was interesting to note that /kn/ was produced by one of the participants, which represents a higher-level identification skill than simple initial consonant sounds because of the silent letter **K** represented in /kn/.

There were 35 invented/temporary spellings recorded for **table**. Thirty-six percent (n=34) constructed the spelling TABL, followed by 14% (n=13) who used the letters TAB to spell **table**. Five percent (n=5) created TABOL for **table**, while 4% (n=4) constructed TEBL, followed by 2% (n=2) who spelled the word **table** as TABEL, TABO, and TEPL. Only 4% (n=4) correctly spelled **table**, followed by a wide range of spellings (i.e., TABEL, TABE, TABO, TABH, TAESNT, TAVO, TADL, TB, TALB, TABR, TAPL, TAVL, TEFL, TEPL, TEBL, TEBOL, TEB, TABOL, TABOOL, TABUOW, TEABAL, TABY, TEVT, TAF, TA, TOBOL, and LT). Analysis of these random spelling indicated an awareness of initial consonant sound /t/ in **table**, with less consistent awareness of ending consonant sound /l/ and medial vowel sound of long /a/.

Participants created 25 invented/temporary spellings for **wagon**, with WAGIN being the most frequent construction for 44% of participants (n=44). The second most common spelling that was created for **wagon** was WAGN (n=18), followed by WAG (n=8), WAGEN (n=3) and (YAGEN (n=2). Individuals created the following temporary spellings for the word **wagon**: W, WA, WAGON, WAGA, WAJN, WAJM, WADIN, WAGQ, WAQN, WGN, WJN, YAGIN, YAGN, YGIN, YIJN, YPO, ZPS, and HAG.

Thirty-six invented/temporary spellings of **bridge** were recorded, with BRIJ occurring more frequently (n=24) than any of the other temporary spellings. Fourteen percent of participants (n=13) constructed the word BIJ, which was the second most

common spelling of **bridge**, followed by BEJ and BRIG (n=5), BRIGE, BREG, and BREJ (n=4), BRISH (n=3), and BEG (n=2) and BIG (n=2). Individual spellings of **bridge** were: BSH, BRIJE, BRIH, BRIHJ, BIJO, BIJG, BRJ, BIGY, BER, BIJU, BJE, BRIR, BESD, BAB, BID, BISST, BN, BRIGS, BI, BRIJD, BIJS, BIS, RIG, R, DREJ, and DRIG. It should be noted that no participants accurately spelled **bridge**.

In conclusion, the analysis of the invented/temporary spellings created by the participants revealed that most were in the second developmental phase of spelling development (i.e., also known as the partial alphabetic phase). In this phase, the students that spelled **drum** with the letter **J** or **G** have difficulty with letter-sound correspondences whose sounds are not present in the names of the letters (Ehri, 1993, 1997, 1998; Moats, 2000). For example, the sounds of /h/, /w/, and /y/ are often used to spell the word **wagon** in this phase. Another example of the partial alphabetic stage was the prevalence of spelling the word **bird** as BRD.

T-test Comparisons of Invented/Temporary Spelling Task Performance

The mean for all kindergarten participants on the temporary spelling tasks was 30.43 (SD = 5.01). Out of a possible 35 phonemes, a range of six to 35 phonemes was correctly identified out of a possible 35 phonemes for all 93 participants. There was no statistical difference ($P=.10$) between the performance of male and female participants on the temporary spelling tasks. The mean for boy participants (n=48) was 30.48 (SD=4.95), with a smaller range of 14 to 35 correct phonemes produced using the magnetic letters and letter board. This means that the boys produced 23% (n=8) more phonemes correctly than girls on the temporary spelling tasks. For these tasks, the mean

for girls (n=45) was about the same at 30.38 (SD=5.13), with a range of six to 35 phonemes correctly produced using magnetic letters and letter board.

Table 4. Number of phonemes produced during temporary spelling tasks.

	Number (N)	Minimum Number of Phonemes	Maximum Number of Phonemes	Mean	Standard Deviation (SD)
All participants	93	6	35	30.43	5.01
Boys	48	14	35	30.48	4.95
Girls	45	6	35	30.38	5.13

A significant statistical difference ($P<.000$) was noted using t-tests to compare temporary spelling task performance of low-performing kindergarten students to on-level kindergarten students. The mean of low-performing kindergarten students (n=47) was 28.19 (SD=5.91), while the mean of on-level kindergarten students was 32.72 (SD=2.25).

Table 5. Means and standard deviations of performance for low-performing and on-level kindergarten participants on temporary spelling tasks.

DIBELS Benchmark	N	Mean	Standard Deviation	Std. Error of Mean
On-level	46	32.72	2.25	.33
Low-Performing	47	28.19	5.91	.86

T-tests did not reveal any statistical differences between low-performing kindergarten boys and low-performing kindergarten girls on temporary spelling task performance ($P=.03$). The male kindergarten students had a mean of 28.22 (SD=5.89), while the female kindergarten students had a similar mean of 28.17 (SD=6.06).

Table 6. Means and standard deviations of performance for low-performing boys and girls on temporary spelling tasks.

Low-Performing Participants	N	Mean	Standard Deviation	Std. Error of Mean
Boys	23	28.22	5.89	1.23
Girls	24	28.17	6.06	1.24

Although the mean performance of on-level boys and girls was higher than the low-performing boy and girl participants, no statistical difference existed between on-level boys and on-level girls' performance on the temporary spelling tasks ($P=.51$). The mean of boys was 32.56 ($SD=2.62$) on temporary spelling performance, while the mean of girls was 32.90 ($SD=1.76$).

Table 7. Means and standard deviations of performance of on-level performing boys and girls on temporary spelling tasks.

On-Level Participants	N	Mean	Standard Deviation	Std. Error of Mean
Boys	25	32.56	2.62	.52
Girls	21	32.90	1.76	.38

Pearson's r correlations, also known as product-moment correlations, were used to measure the degree to which Initial Sound Fluency (ISF), Letter Naming Fluency (LNF), Phoneme Segmentation Fluency (PSF), and Nonsense Word Fluency (NWF) DIBELS measures were related to student performance on the temporary spelling tasks for all 93 students. Overall, no significant correlations were found to exist between any of the four DIBELS subtest measures and temporary spelling task performance of the participants. Specifically, the correlations for ISF ($r=.31$) and NWF ($r=.31$) showed the weakest correlation among DIBELS measures and student performance on the temporary spelling tasks. A weak correlation ($r=.39$) was reported for all students on Letter Naming

Fluency (LNF) and the invented spelling task. Although not statistically insignificant, the highest correlation between a DIBELS measure and the invented spelling task ($r = .50$) was on Phoneme Segmentation Fluency (PSF).

Table 8. Correlations between DIBELS measures and temporary spelling scores.

	ISF	LNF	PSF	NWF
Pearson Correlation Sig. (2-tailed)	.31	.39	.50	.31

Word-Learning Tasks

The word-learning tasks were completed on two consecutive days in the same order and sequence for each participant. A criterion score of seven was assigned for a perfect matching of the 12 word/picture cards on the first attempt. A criterion score of six was assigned for a perfect matching of the 12 word/picture cards on the second attempt, and so on up to seven perfect matching attempts. Upon matching of all word/picture cards correctly, the task was terminated and a criterion score (i.e., 7 was the highest score) was recorded on the Criterion Scoring Sheet. Some participants continued to match all 12 word/picture cards until no errors were made for up to seven attempts, while others matched all pairs correctly on the first attempt. If word/picture cards were mismatched on the seventh trial, a score of zero was recorded, and the task was terminated. The same procedure and criterion scoring method was used for Day 2.

With a maximum criterion score of seven for the word-learning tasks, the reported mean for all 93 participants was 5.76 (SD=1.66). Data revealed no statistically significant correlations between the numbers accurately matched on Day 1 and the numbers accurately matched on Day 2 for the word-learning tasks. For example, on Day 1, 27% (n=25) of all participants matched all 12 word/picture cards accurately on the first

trial. On Day 2, 46% (n=43) of all participants matched all 12 word/picture cards, which represents a 19% increase in the number of error-free first attempts (n=18).

Table 9. Word-learning criterion scores of all participants by frequency and percent.

Criterion Score	Day 1		Day 2	
	Frequency	Percent	Frequency	Percent
0	12	12.9	2	2.2
1	6	6.5	2	2.2
2	2	2.2	1	1.1
3	4	4.3	4	4.3
4	12	12.9	7	7.5
5	11	11.8	13	14.0
6	21	22.6	21	22.6
7	25	26.9	43	46.2
Total	93	100.00	93	100.00

There was little or no correlation ($P=.29$) when comparing Day 1 performance between boys ($n=48$) and girls ($n=45$) on the word-learning tasks. Male participants had a mean of 4.75 ($SD=2.46$) while female participants had a mean of 4.40 ($SD=2.43$) for Day 1. On Day 2, although not significant, male participants had a slightly higher mean of 5.81 ($SD=1.75$) and female participants had also had higher mean of 5.71 ($SD=1.58$) for word-learning tasks. There was also no significant difference in Day 1 or Day 2 performance when comparing low-performing boys and low-performing girls on the word-learning tasks. For Day 1, the mean for low-performing male participants was 3.78 ($SD=2.70$) and the mean for low-performing female participants was slightly lower at

3.00 (SD=.49). For the first day, the level of significance ($P=.42$) indicated a weak association between low-performing boys and low-performing girls on Day 1 word-learning tasks. Although not statistically significant, the means for low-performing boys and low-performing girls were higher on Day 2 than on Day 1. On the second day, data revealed and the mean for low-performing boys of 5.52 (SD=1.93), and a mean of 5.00 (SD=1.82) for low-performing girls. Although the means were higher for both low-performing boys and low-performing girls on Day 2, there was no statistically significant correlation between low-performing boys and low-performing girls on Day 2 word-learning tasks ($P=.84$). Therefore, no significant differences in the performance of low-performing boys and low-performing girls for Day 1 or Day 2 on the word-learning tasks were noted in the study ($P=.59$).

Table 10. Means and standard deviations of word-learning task performance between boys and girls.

	Day 1 Word-Learning Tasks		Day 2 Word-Learning Tasks	
	Mean	Standard Deviation	Mean	Standard Deviation
Boys Total	4.75	2.46	5.81	1.75
Girls Total	4.40	2.43	5.71	1.58
Low-Performing Boys	3.78	2.70	5.52	1.93
Low-Performing Girls	3.00	.49	5.00	1.82
On-Level Boys	5.64	1.87	6.08	1.55
On-Level Girls	6.00	1.18	6.52	.60

When comparing on-level boys with on-level girls' performance on Day 1 word-learning tasks, the means were similar but there was no correlation between the two

groups ($P = .16$). The mean for on-level boys was 5.64 ($SD = 1.87$) and the mean for on-level girls was slightly higher at 6.00 ($SD = 1.18$) for Day 1 word-learning performance. The Day 2 performance mean for on-level boys, although not significant, was higher at 6.08 ($SD = 1.55$) and, although not significant, the mean for on-level girls was higher on Day 2 at 6.52 ($SD = .60$), which indicated that the difference in performance between boys and girls changed very little from Day 1 to Day 2 on word-learning tasks. Statistically, t-tests revealed little or no association between on-level boys and girls on Day 2 word-learning tasks ($P = .01$).

However, a statistically significant finding emerged when comparing low-performing students and on-level students on Day 1 word-learning task performance ($P < 0.001$). The on-level male participants had a mean of 5.80 ($SD = 1.59$), while female participants had a much lower mean of 3.38 ($SD = 2.54$). There was little or no significant difference, however, in Day 2 performance between these two groups ($P = .01$). The mean for male participants was 6.28 ($SD = 1.22$) and 5.26 for female participants ($SD = 1.87$) for word-learning performance on Day 2.

Table 11. Low-performing and on-level word-learning task performance.

	Day 1 Word-Learning Tasks		Day 2 Word-Learning Tasks	
	F	Sig.	F	Sig.
Low-Performing and On-Level Students	22.88	.00	6.77	.01

Two-tailed t-tests were used to identify any correlations between the individual DIBELS subscores and the word-learning tasks. Data analysis revealed weak correlations for Day 1 based on the criteria score assigned to each participant as a result of the number of accurately matched word/picture card pairs. Weak or no correlations

were found to exist between word-learning task performance and ISF ($r=.19$), LNF ($r=.26$), PSF ($r=.29$), NWF ($r=.38$) on Day 1 scores for all participants. Only Day 1 correlations were calculated for comparison with temporary spelling pattern correlations with DIBELS data, which, unlike the word-learning tasks, consisted of only one day of assessment.

Table 12. Correlations between DIBELS measures and Day 1 word-learning scores.

	ISF	LNF	PSF	NWF
Pearson Correlation				
Sig. (2-tailed)	.19	.26	.29	.38

Combined Days of Data on Task Performance

Table 13 illustrates how Day 1 and Day 2 data were also combined for analysis in order to determine the effect size of the proportion of variance between the means. Eta squared was used to calculate the proportion of variance of the dependent variable that is explained by the independent variable. Values for eta squared range from 0 to 1, depending on the variation or strength of association. The following values were used in order to interpret the strength of the eta squared values: 1) .01 means = small effect, 2) .06 = moderate effect, and 3) .14 = large effect (Cohen, 1988). Table 13 illustrates that the study had a large effect size of 1.60, computed at the .05 alpha level.

Table 13. Eta squared values to show effect size of Day 1 and Day 2 data.

Source	Df	F	Sig	Partial Eta Square
Intercept	1	1264.95	.00	.160
Level	1	35.03	.00	.873
Error	184		.00	.160
Total	186			

When Day 1 and Day 2 word-learning task performance data was combined, 94 students were low-performing students, and 92 students were on-level (i.e., average n=93). The mean for low-performing students was 4.32 (SD = 2.41) and the mean for on-level students was higher at 6.04 (SD=1.43).

Table 14. Means and standard deviations of Day 1 and Day 2 data.

DIBELS Benchmark	N	Mean	Standard Deviation
Below Level	94	4.32	2.41
On-Level	92	6.04	1.43
TOTAL	186	5.17	2.16

Conclusion

When comparing the overall performance of participants on both tasks, the only statistically significant correlation was on-level students performed better on the temporary spelling and word-learning tasks than the low-performing students. Gender did not affect the performance on the two tasks to any level of significance. Table 15 illustrates the overall comparison of student performance on temporary spelling and word-learning tasks for all students.

Table 15. Means and standard deviations of student performance on temporary spelling tasks as compared to student performance on Day 1 and Day 2 word-learning tasks.

	Day 1 Temporary Spelling Tasks		Day 1 Word-Learning Tasks		Day 2 Word-Learning Tasks	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Boys	30.48	4.95	4.75	2.46	5.81	1.75
Girls	30.38	5.13	4.40	2.43	5.71	1.58
Low- Performing Boys	28.22	5.89	3.78	2.70	5.52	1.93
Low- Performing Girls	28.17	6.06	3.00	.49	5.00	1.82
On-Level Boys	32.56	2.62	5.64	1.87	6.08	1.55
On-Level Girls	32.90	1.76	6.00	1.18	6.52	.60

CHAPTER 5

SUMMARY AND CONCLUSIONS

Discussion

The present study was designed to investigate the correlation between invented/temporary spelling patterns and beginning reading for low-performing and on-level boys and girls in kindergarten. In addition, an attempt was made to determine if gender played any statistically significant role in task and beginning reading performance. Two research questions were examined: 1) Is there a statistically significant relationship between invented spelling as displayed in task and reading skills as measured by DIBELS? and (2) Does the performance displayed in task and beginning reading skills as measured by DIBELS differ significantly for boys and girls in kindergarten?

Demographic and descriptive information was gathered using extant district and school data. Student performance data was gathered using extant school *Dynamic Indicators of Basic Early Literacy Skills* (DIBELS) benchmarks at collected at midyear of kindergarten. Although all students in the seven kindergarten classes participated in the individual tasks administered by the researcher, the students were identified for data analysis purposes using the school's DIBELS data in order to determine which children were low-performing and on-level students. DIBELS data did not affect the type of tasks completed by the students because all participants completed the same tasks in the same order and sequence using the same materials. It was hypothesized that students with below DIBELS benchmark scores would not perform as well as students with on-level DIBEL benchmark scores for the invented/temporary spelling and word-learning tasks

(Good & Kaminski, 2002). This hypothesis was based on research that found some students do not learn to read as quickly as others do because of gaps in their phonological processors (Adams, 1990, 1998; Moats, 2000; Shaywitz, 2003; Snow, et al., 1998). Additional studies on which the hypothesis was based reveal that students with these phonological processor deficits in their perform better on early literacy acquisition skills after receiving systematic explicit phonemic awareness instruction and/or intervention (Ehri, 1994, 1995, 1997; Farstrup, 2002; Foorman, et al., 1997, 1998; Gentry, 2004; Invernizzi, 1992; McGee & Richgels, 2000; Morris & Perney, 1984, Morris, et al., 2003; NRP, 2000; Orton, 2000). In order to strengthen the hypothesis, a review of the literature was conducted to locate studies that cited the reason or cause for this relationship between weak phonological skills and learning to read. As a result, the hypothesis was also based on research conducted by Ehri (1993), Frith (1985), Henderson & Templeton (1986), Perfetti (1992), and Moats (2000) who explain the positive correlations that exist between phonological deficits and weak reading ability are because spelling and reading use the same lexicon. For example, as spelling or reading errors emerge, insightful data emerges on which phase/stage the phonological processor is functioning for both spelling and reading. Finally, the work of Templeton & Morris (1999) served as a basis when forming the hypothesis for this study. They argue beginning readers are letter-name spellers, which means that with each lexical representation, the beginning reader must apply phonemic awareness initially as they move closer to convention spelling and convention reading.

It was also hypothesized that gender would not significantly affect task performance and beginning reading ability. This hypothesis was drawn based on the lack

of evidence stating correlations exist relative to performance and gender in the early stages of learning to read.

Summary

A review of the descriptive data regarding sample characteristics indicated that the researcher had been successful in selecting a diverse sample. Forty-eight percent of the sample was boys, 57% were receiving free/reduced lunch, and 49% were reading on-level. The measure of early literacy skills used in this study was the *Dynamic Indicators of Basic Early Literacy Skills* (DIBELS) for kindergarten. The tests used for this analysis were the midyear benchmarks for kindergarten students using DIBELS: ISF, LNF, PSF, and NWF. Students were classified as on level when all four DIBELS measures were recorded in the student booklet for midyear. DIBELS was selected because it was used by the school selected for the study, and had been administered by a trained DIBELS school test coordinator.

Research Question One: Task Performance and Beginning Reading

The findings from research question one revealed that on-level kindergarten participants performed significantly better than low-performing kindergarten participants on the invented/temporary spelling and word-learning tasks. This finding was consistent with research that argues there is a reciprocal relationship between phoneme awareness and invented spelling (Adams, 1990; Ehri, 1993, 1997, 1998; Ferroli & Shanahan, 1987; Frith, 1985; Henderson & Templeton, 1986; Moats, 2000; Perfetti, 1992; Richgels, 1995, 2001, Routman, 1994, 1996, Stahl & Murray, 1998). In addition, the results for the current study indicated that on-level participants possessed greater phonological awareness than low-performing participants because on-level participants were better able

to identify and produce sounds and letters in words than low-performing participants. These findings were consistent with the correlational studies conducted by Ehri & Wilce (1985, 1987), Ehri (1993, 1997), Read (1971) and Richgels (1986a, 1986b, 1995). Also consistent with the findings of research question one is a conclusion drawn by Adams (1990) which states that:

the process of invented spelling is essentially a process of phonics...The evidence that invented spelling activity simultaneously develops phonemic awareness and promotes understanding of the alphabetic principle is extremely promising, especially in view of the difficulty with which children are found to acquire these insights through other methods of teaching. (p. 387)

In addition to the above findings, no significant correlations were identified between individual DIBELS measures of ISF, LNF, PSF, and NWF and invented/temporary spelling task performance. This was true regardless of the actual scores on each individual DIBELS measure.

These results supported the assumption that a kindergarten student's ability to sound out and spell words phonetically could be associated with on-level reading status. Correlational studies in agreement with these results include the work of Burns and Richgels (1989), Clarke (1988), Ehri (1993, 1997), Ehri, et al. (2001), Ehri and Wilce (1985, 1987), McGee and Richgels (2000), Richgels (1986a, 1986b, 1995, 2001), and Stice and Bertrand (1990), and Stahl and Murray (1998). Their research concluded that students performed better on spelling and word recognition tests than students who were not encouraged to use invented/temporary spelling. This finding along with the others

cited identifies the reciprocal relationship of reading, writing, and spelling in emergent literacy instruction (i.e., instructional taught in tandem rather than as isolated subjects).

The results of the study are also consistent with other studies that demonstrate the developmental progression of invented spelling in tangent with the developmental progression of beginning reading patterns (Bear, et al., 2000; Ehri, 1987, 1989, 1994, 1997; Ehri & Wilce, 1985, 1987; Gentry, 1982a, 2001, 2004; Invernizzi, 1992; Moats, 2000; Read, 1971, 1986; Routman, 1994, 1996, 1997; Stahl & Murray, 1998). In addition, spelling and reading both build upon orthographic knowledge (Ehri, 1997; Ganske, 1994; Gill, 1992; Invernizzi, 1992; Richgels, 1995, 2001; Zutell & Rasinski, 1989). In fact, Perfetti (1992) observed, “spelling and reading use the same lexical representation. In fact, spelling is a good test of the quality of representation” (p. 170).

On the invented/temporary spelling tasks, two predominant temporary spelling patterns emerged when FET was created for **feet** (n=56) and BRD was created for **bird** (n=55). These spellings are consistent with the spellings of similar aged students in related studies (Burns, 1986; Burns & Richgels, 1989; Richgels, 1995). In addition, also consistent with these same studies included the use of the letters *G* and *J* as initial consonants to spell with word DRUM and the use of the letter *Y* as an initial consonant to spell the word WAGON. Further findings from student spellings revealed an absence of medial vowels in invented/temporary spellings of kindergarteners (i.e., BRD for bird; YGN for wagon), which is also consistent with Burns (1986), Burns & Richgels (1989), Richgels (1995) as well as with studies by Moats (2000), Shaywitz (2003), and Snow, et al., 1998.

Research Question Two: Task Performance and Gender

No statistically significant differences were noted between male and female participants' performance on the invented/temporary spelling tasks or the word-learning tasks. Comparisons indicated that significant performance on tasks were significantly different when comparing reading levels for performance on both tasks, but not for gender. On-level participants scored higher than low-performing participants on the temporary spelling tasks and on the word learning tasks. However, there was very little or no association between performance among male and female participants on the temporary spelling tasks and the word-learning tasks. This result supports the research, which has not identified gender to be a statistically significant issue in the ability to sound out and spell word phonetically. Therefore, the need for gender-specific performance in invented/temporary spelling and word-learning tasks as it relates to beginning reading could be an area of interest for future research.

Limitations of the Study

The present study suggests and is in agreement with other correlational studies that argue invented/temporary spelling patterns and word-learning tasks are related (Clarke, 1988; Ehri & Wilce, 1985, 1987; Ehri, 1997; Richgels, 1986a, 1986b, 1995, 2001). Although these results cannot be generalized beyond this population, it is appropriate to conclude that an important link exists between the two skills when learning to read. For this reason, generalization of results beyond this population and ones similar to this population would not be recommended. It would be appropriate to conduct this study on a much larger scale in order to make generalizations regarding the role of temporary spelling and word-learning in emergent literacy settings.

This study also suggests that invented spelling is part of the developmental process of beginning reading which is consistent with the conclusions drawn by Frith (1985), Gentry (1978, 1982a, 1982b, 2001, 2004), Gentry & Gillett (1993), Gill (1992), Gough & Hillinger (1980), Henderson & Templeton (1986), Invernizzi (1992), Kroese, et al. (2000), Lombardino, et al. (1997), Moats (2000), Morris & Perney (1984);, Morris, et al. (2003), Nunes, et al. (1997), Perfetti (1985), Read (1971, 1975, 1986), Richgels (1995), Richgels & Barnhart (1992), Routman (1994, 1996); Stahl, et al. (1999), Templeton & Morris (1999), Zutell (1992), and Zutell & Rasinski (1989).

The second limitation of the study was the exclusion of parental interviews in the data collection process. It would have been helpful to know what type of exposure to print the child/children had received prior to the study so that the additional variable of concepts of print could be added to the analysis relative to student performance on the temporary spelling and word-learning tasks. Based on the Hart & Risely (1995) study, parental influence weighs heavily on a child's oral language and vocabulary size.

A third limitation of the study was related to the number of words used for the temporary spelling (n=10) and the word-learning tasks (n=12). The study would have produced a broader range of data had a wider range of words been selected.

Implications for Further Study

Data gathered from this dissertation generated several directions for future research. First of all, a longitudinal study of this same population would be beneficial to measure the impact of age, instruction, parental involvement, reading level, and other factors relative to student performance in kindergarten. The study could focus on literacy experiences that allow children to be exposed to concepts related to sounds, letters,

letter/sound relationships, words, phrases, sentences, and ultimately paragraphs. After all, developmental theorists such as Gentry, Moats, Read, and Routman all believe there is a strong connection between spelling, reading, and writing that develops over time based on a multitude of factors upon which future studies could examine.

Using the Hart & Risely (1995) as a framework, additional research could be conducted using this dissertation to measure the impact of parental impact on how well their child/children performed on the temporary spelling task and the word-learning tasks. Parental interviews, student interviews, observations of parent-child dialogues, and home visits could provide much valuable insight into overall performance at school (i.e., reading, spelling, writing, mathematics, science, social studies, social skills, etc).

Additional research could also investigate the impact of temporary spelling patterns and writing fluency among kindergarten students and beyond. Research tells us that when a writer does not feel restrained to focus on spelling each word correctly, the mind becomes more open to write more creatively and with expression (Gunderson & Shapiro, 1987, 1988; Clarke, 1988; Gunderson & Shapiro, 1987, 1988; Kross, Rhein, Sammons, & Mather, 2000; Lambardino, Bedford, Fortier, Carter, & Brandi, 1997; Stice & Bertrand, 1990; Stahl & Murray, 1998). Future research could examine to see if this generalization is true and if so, to what extent does temporary spelling per se have on writing fluency. The findings from this research could be further analyzed by viewing subgroup performance among emergent writers.

Conclusions

Several important conclusions were generated as a result of this research study. Just as in the Read (1975) study, even at an early age, the participants in the study were

able to detect phonetic characteristics of words that English spelling represents. Results of this study were also consistent with the research of Orton (2000) who discovered words were frequently spelled phonetically in the early writing samples of young children and were indicative of their phonological awareness of the words in the passages. Since the low-performing students did not score as highly as the on-level students on the temporary spelling tasks and the word-learning tasks, the results of this research study were consistent with Adams (1990), who reported that “about one-quarter of middle-class first graders and many more of those without much exposure to print had not mastered phonemic awareness” (p. 329). Also consistent with this study were the findings of Farstrup & Samuels (2002), Moats (1999, 2000), NRP (2000), and Snow, et al., 1998) that predict weak readers can often be identified at a young age by assessing their abilities to manipulate letter sounds, to rapidly name letters and numbers, and to demonstrate an awareness of the concepts of print.

Therefore, this research, along with the research previously cited suggests that a correlation exists between invented spelling patterns and learning to read words in kindergarten Language Arts instructional settings (Bear, et al., 2000; Burns & Richgels, 1989; Ehri, 1995, 1997, 2001; Ehri & Wilce, 1987; Gentry, 2000a, 2001; Greenberg, et al., 1997; Guthrie, 1973; Richgels, 1995, 2001; Snow, et al., 1998; Stahl & Murray, 1998; Stanovich, et al., 1984, Vellutino & Scanlon). With this possibility, teachers can plan instruction to ensure students receive integrated reading, writing, and spelling instruction that is explicit and developmental in nature in order to maximize literacy potential for all students learning to read as well as for those others trying to improve their reading skills.

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APPENDIX A
LETTERS OF SUPPORT AND APPRECIATION

*Jane McDaniel Grove
13124 Carrington Place Avenue
Baton Rouge, Louisiana 70817
(225) 753-8167; 342-9891 fax*

April 5, 2005

District Superintendent
123 Happy Drives
Any Town, USA 12345

Dear Superintendent:

I am seeking approval to conduct a research study at _____ Elementary School in the _____ School District. The study has been exempted from Institutional Review Board oversight by Louisiana State University.

I have titled this study, “An Investigation of the Relationship of Temporary Spelling Patterns and Word Learning Between Low-Performing and On-Level Kindergarten Students.” The study is being conducted for my dissertation as a partial requirement for the Doctor of Philosophy degree from the College of Education, Louisiana State University. I am the sole researcher for this study, under the direct supervision of Major Professors and Co-Chairpersons Dr. Earl Cheek and Dr. Margaret T. Stewart, College of Education, Louisiana State University. Only one school, _____ Elementary School in _____ will be involved in this study.

The study is described in the attached IRB exemption forms. In brief, it is a quantitative study that will be conducted during the month of April 2005. This study will assess kindergarten student’s temporary spelling and word learning abilities through use of magnetic letters and magnetic letter boards. Some oral recitations will be recorded as students point to picture cards and speak the word aloud that have corresponding pictures on them that match temporary spellings. All assessment tasks will be conducted outside the classroom in a quiet location to be determined by the school administrator.

The initial selection of participants for the study will be determined based on the researcher’s examination of existing *Dynamic Indicators of Basic Early Literacy Skills* (DIBELS) mid-year data. Students who scored below benchmark will be assessed exactly as students who scored on and above benchmark status. The only time a distinction will be made between the two groups will be in the data analysis and reporting section of the dissertation. The researcher will read all directions verbatim and modeled tasks to each student individually. Following a trial run with seven word and picture cards, actual assessment will begin using 12 nouns. All responses will be recorded on a scoring sheet, which will be kept confidential and for research purposes only.

District Superintendent
April 5, 2005
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The time commitment required will be a brief overall meeting with administrative and kindergarten teachers to explain the study the first week in April. The actual time for the study will vary depending on individual student response time since this is not a timed assessment. However, it should be noted that when a student is assessed for the first task on Day 1, that same student would be assessed with a second task the following day. Task completion for each student on two consecutive days will continue until all students have been assessed. Once the study is concluded, we will provide the results of the study to any interested person upon request.

Thank you for your consideration and support of this request.

Sincerely,

Jane McDaniel Grove

c Dr. Earl Cheek
Dr. Margaret T. Stewart
Principal

Title of Research Study: “An Investigation of the Relationship of Temporary Spelling Patterns and Word Learning Between Low-Performing and On-Level Kindergarten Students”

Project Director: Jane McDaniel Grove, Doctoral Student, (225) 753-8167

This study will be conducted under the supervision of Co-chairpersons of my doctoral committee, Dr. Earl Cheek and Dr. Margaret T. Stewart, Louisiana State University College of Education (225) 578-6017; (225) 578-4690.

Purpose of the Research: The purpose of the study is to investigate the relationship, if any, of temporary spelling patterns and word learning for kindergarten students in a southern Louisiana public school district.

Procedures for the Research: Participants for the study will be selected based on the *Dynamic Indicators of Basic Early Literacy Skills* (DIBELS) mid-year progressing monitoring data collected by the school testing coordinators and/or teachers. Permission forms for participation from superintendents, principals, teachers, parents, and students will be collected April 8-15, 2005. I will provide all materials to use to collect data for this study, which will consist of magnetic letters, magnetic letter boards, and scoring sheets, all of which will be kept confidential. A trial run will be administered to ensure students understand the directions before the actual tasks are given. All directions for each task will be first modeled by the researcher (myself) and read aloud verbatim. Each student will be assessed individually, with a monitor occasionally checking for oversight using a prepared checklist provided by the researcher. I will conduct quantitative analysis of the data, and will share the results of the study upon request.

Potential Risks: There are no potential risks associated with this study. The tasks assigned will involve moving magnetic letters on magnetic letter boards, and will pose no risk to students. Although the study will be conducted during the normal school day, the school administrator will assign a quiet location to conduct the tasks in order to avoid disturbing the other students since oral recitations are part of the tasks assigned.

Potential Benefits: The potential benefits to students are increased attention to and use of temporary spelling patterns to increase word learning in the beginning stages of learning to read. Students who become more conscious of using these instructional strategies as they read, write and attempt to spell words as best they know how may find greater success and enjoyment in reading and writing as well as in many other content areas.

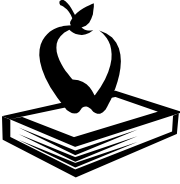
Alternative Procedures: Participation in this research study is entirely voluntary, and any student, parent or parental guardian may withdraw consent and terminate participation at any time without consequence. Whether or not your child participates in the study will not affect his/her grade or involvement in any class-related activities.

Protection of Confidentiality: All students, the teachers, and the schools will be given pseudonyms to protect their identities and privacy.

Signature: *I have been fully informed of the above-described procedure with its possible benefits and risks and give my permission for the participation of my child in the study.*

Child's Name Parent's Signature Parent's Name (Print) Date
If you give permission for your child to participate in the study, he/she will be asked to sign below. I want to be in the study with Mrs. Jane McDaniel Grove. The study was explained to me.

Child's Signature Date Jane McDaniel Grove Date



April 7, 2005

Dear Parents,

I am a graduate student at LSU, and would like to study the impact of temporary spelling and word learning patterns with kindergarten children. I would appreciate your allowing me to ask your child to complete some tasks using a magnetic letter board and letters for my research. There will be no special grouping, grades assigned, etc. The tasks will involve two days, for not more than 10 minutes of time each day.

Attached you will find a Child Consent Form, which include more details about the study. Please sign and ask your child to sign the form so your child can participate in my study. **Please return your consent by Thursday, April 14, 2005 to your kindergarten teacher.**

If you have any questions, please let me know by calling (225) 753-8167.
Thank you very much.

Sincerely,

Jane M. Grove
LSU Doctoral Student



Thank you!!!

April 15, 2005

Dear Parents,

Thank you for signing the Child Consent Form which allows your child to participate in my research study, "An Investigation of Temporary Spelling Patterns and Word Learning Between Low-Performing and On-Level Kindergarten Students."

The results will be made available to anyone interested upon completion of my dissertation in August. Those results will be made available at _____ Elementary School or you may call me at (225) 753-8167.

Please once again accept my thanks and appreciation for your cooperation in my research study.

Sincerely,

Jane M. Grove

Jane McDaniel Grove

*13124 Carrington Place Avenue
Baton Rouge, Louisiana 70817
(225) 753-8167; 342-9891 fax*

April 26, 2005

District Superintendent
123 Happy Drive
Any Town, USA 12345

Dear Superintendent:

I am writing you to thank you, the _____ School District, and Principal _____ for allowing me to conduct my doctoral research at _____ Elementary School. The results of my dissertation will be made available upon request in August.

My experience working at _____ Elementary School has been a very positive one, for which I am most grateful. Principal _____ was instrumental in making my study a success by allowing me cordial access to her school, kindergarten teachers, kindergarten students, and testing location during school hours. Her willingness to secure a private, quiet place went beyond the call of duty, which required special scheduling on her part. Principal Strauss is to be commended for her flexibility and superb management of my time at the school.

Again, I want to commend you, the _____ School District, as well as Principal _____ for the wonderful, rewarding experience this has been for me. Without the dedicated persons I have mentioned, quality research would not be possible. Therefore, please accept my thanks and wishes for much continued success in years to come.

Sincerely,

Jane McDaniel Grove

c Dr. Earl Cheek
Dr. Margaret T. Stewart
Principal _____

APPENDIX B

TASK SCORING SHEETS

Invented Spelling Task Recording and Score Sheet

Directions to read aloud to student:

Have you ever tried to write or spell words for your mother or father? Well, today I am going to have you spell some words for me. I am going to show you some pictures and then I want you to spell some words for me—the way you would spell them.

However, before, we start, I want you to first use these letters and spell your name right here on this board.

NAME: _____

Now, look at this picture. What is it? That's right. Now spell it.

WORD	RESPONSE	SOUNDS
1. Nose	_____	I S M F
2. Feet	_____	I S M F
3. Table	_____	I S M F
4. Pie	_____	I S M F
5. Bird	_____	I S M F
6. Nest	_____	I S M F
7. Bridge	_____	I S M F
8. Sock	_____	I S M F
9. Drum	_____	I S M F
10. Wagon	_____	I S M F

Subscore: Initial Consonants _____
Long Vowels _____
Short Vowels _____
Medial Consonants _____
Final Consonants _____
Blends _____

TOTAL _____

WORD		CRITERION					POINTS/SCORE
1.	NOSE	N	O OW	S			3
		/1/	/1/	/1/			
2.	FEET	F	E I	T			3
		/1/	/1/	/1/			
3.	TABLE	T	A E	B	L		4
		/1/	/1/	/1/	/1/		
4.	PIE	P	I E Y				2
		/1/	/1/				
5.	BIRD	B	R	D			3
		/1/	/1/	/1/			
6.	NEST	N	E A	S	T		4
		/1/	/1/	/1/	/1/		
7.	BRIDGE	B	R	I E	G J		4
		/1/	/1/	/1/	/1/		
8.	SOCK	S	O I	K C			3
		/1/	/1/	/1/			
9.	DRUM	D	R	U I	M		4
		J G /1/	/1/	/1/	/1/	/1/	
10.	WAGON	W	A I	G	O A E I U	N	5
		Y /1/	/1/	/1/	/1/	/1/	
TOTAL POINTS POSSIBLE							35

Source: Burns, J. M. (1986).

Criterion Scoring Sheet for Word Learning Tasks

Name: _____ Boy Girl DIBELS: Below OnTeacher: _____

Directions: Say to the student: *Today we are going to look at some word cards and picture cards. I want you to repeat each picture and word card after I say each one. (Start with word 1 and continue to word 12, with student repeating words and pointing to each picture and word card.) Now I want you to match these picture cards with their word cards and put in pairs on your own, like you do when you play the card game "Old Maid." Do you have any questions? Circle any errors and record score.*

DAY ONE – Criterion Score _____

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Trial 6	Trial 7
1. PNO	1. PNO	1. PNO	1. PNO	1. PNO	1. PNO	1. PNO
2. PKJ	2. PKJ	2. PKJ	2. PKJ	2. PKJ	2. PKJ	2. PKJ
3. TEM	3. TEM	3. TEM	3. TEM	3. TEM	3. TEM	3. TEM
4. TUB	4. TUB	4. TUB	4. TUB	4. TUB	4. TUB	4. TUB
5. NDN	5. NDN	5. NDN	5. NDN	5. NDN	5. NDN	5. NDN
6. NRS	6. NRS	6. NRS	6. NRS	6. NRS	6. NRS	6. NRS
7. PARAKET	7. PARAKET	7. PARAKET	7. PARAKET	7. PARAKET	7. PARAKET	7. PARAKET
8. PLASMAT	8. PLASMAT	8. PLASMAT	8. PLASMAT	8. PLASMAT	8. PLASMAT	8. PLASMAT
9. TELEFON	9. TELEFON	9. TELEFON	9. TELEFON	9. TELEFON	9. TELEFON	9. TELEFON
10. TAMBREN	10. TAMBREN	10. TAMBREN	10. TAMBREN	10. TAMBREN	10. TAMBREN	10. TAMBREN
11. NEWZPAPR	11. NEWZPAPR	11. NEWZPAPR	11. NEWZPAPR	11. NEWZPAPR	11. NEWZPAPR	11. NEWZPAPR
12. NUTKRAKER	12. NUTKRAKER	12. NUTKRAKER	12. NUTKRAKER	12. NUTKRAKER	12. NUTKRAKER	12. NUTKRAKER
____/12	____/12	____/12	____/12	____/12	____/12	____/12

DAY TWO – Criterion Score _____

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Trial 6	Trial 7
1. PNO	1. PNO	1. PNO	1. PNO	1. PNO	1. PNO	1. PNO
2. PKJ	2. PKJ	2. PKJ	2. PKJ	2. PKJ	2. PKJ	2. PKJ
3. TEM	3. TEM	3. TEM	3. TEM	3. TEM	3. TEM	3. TEM
4. TUB	4. TUB	4. TUB	4. TUB	4. TUB	4. TUB	4. TUB
5. NDN	5. NDN	5. NDN	5. NDN	5. NDN	5. NDN	5. NDN
6. NRS	6. NRS	6. NRS	6. NRS	6. NRS	6. NRS	6. NRS
7. PARAKET	7. PARAKET	7. PARAKET	7. PARAKET	7. PARAKET	7. PARAKET	7. PARAKET
8. PLASMAT	8. PLASMAT	8. PLASMAT	8. PLASMAT	8. PLASMAT	8. PLASMAT	8. PLASMAT
9. TELEFON	9. TELEFON	9. TELEFON	9. TELEFON	9. TELEFON	9. TELEFON	9. TELEFON
10. TAMBREN	10. TAMBREN	10. TAMBREN	10. TAMBREN	10. TAMBREN	10. TAMBREN	10. TAMBREN
11. NEWZPAPR	11. NEWZPAPR	11. NEWZPAPR	11. NEWZPAPR	11. NEWZPAPR	11. NEWZPAPR	11. NEWZPAPR
12. NUTKRAKER	12. NUTKRAKER	12. NUTKRAKER	12. NUTKRAKER	12. NUTKRAKER	12. NUTKRAKER	12. NUTKRAKER
____/12	____/12	____/12	____/12	____/12	____/12	____/12

APPENDIX C
OBSERVATION CHECKLIST

OBSERVATION CHECKLIST

Directions: Please check **Yes** or **No** and provide comments as needed.
Additional/general comments may also be written on the back of this checklist. Thank you!

Yes **No** 1. Directions were read as written for each student observed.

Yes **No** 2. Interruptions and/or distractions were observed when directions were read.

Yes **No** 3. All testing materials were presented in same order using the same method of delivery for each student observed.

Yes **No** 4. Test administrator sat in the same location and proximity during testing for each student observed.

Yes **No** 5. Test administrator liked some students better than others (e.g., showed bias for/against).

Yes **No** 6. Student(s) were allowed to voluntarily stop testing at any time.

Yes **No** 7. All tasks were presented in the same order for each student observed.

Yes **No** 8. All tasks were timed for all students observed.

Yes **No** 9. There were interruptions and/or distractions observed during task completion.

Yes **No** 10. The same materials were used for all students observed.

Yes **No** 11. The same tasks were completed by all students observed.

12. Additional/General Comments:

VITA

Jane McDaniel Grove was born to Jim and Bonnie McDaniel in the rural Mississippi delta. Coming from a family of former LSU Tigers, she was the only student in her graduating class to attend LSU. There she earned a Bachelor of Science and a Master of Science degree, while studying overseas in Rome, Italy, and The University of Hawaii during the summer months. A second Master of Science degree was earned from Florida State University in Tallahassee, Florida. Upon graduation, Jane returned to Louisiana to teach as a full-time instructor in home economics at Louisiana Tech University.

After marriage and two children, Kimberly and Jacob, Jane returned to LSU to earn her elementary education certification. Upon graduation, she taught second, third, fourth, and fifth grade. Her first job was in an inner-city school in East Baton Rouge Parish, but she also taught in suburban schools during the regular school year and as a Chapter I teacher during the summer months. She earned an Academic Distinction Award as well as an Education Specialist degree in Reading Curriculum and Instruction from LSU in May 2001.

In the fall 2001, she made a career move to work at the Louisiana Department of Education in the Division of Student Standards, Accountability, and Assistance as a Reading and Literacy consultant and grant writer. As a program consultant, Jane has served on the Louisiana Reading Leadership Team, the Louisiana Literacy Task Force, and numerous other state level committees aimed at improving literacy in the state. She managed federal reading grants, including the Reading Excellence Act, America Reads, Reading First, and the Louisiana Literacy Corps, which was an affiliate of the federally

sponsored AmeriCorps program. State-sponsored programs managed include the K-3 Reading and Mathematics Initiative, the Multisensory Structured Language Program, and the Prek-12 State Reading Plan. Jane has provided multiple professional development trainings for teachers, administrators, and training of trainer meetings throughout the state.

Presently, Jane is employed at the Louisiana Department of Education as a program consultant in the Division of Student Standards and Assessment. Her current position includes working with the state's newly created Comprehensive Curriculum for prekindergarten through grade 12 for English/language arts, mathematics, science, and social studies.

Jane, her husband, Billy, and their wire-hair fox terriers, Captain and Buttons, reside in Baton Rouge, Louisiana. She will receive her Doctor of Philosophy degree from Louisiana State University on August 11, 2005.