THE EFFECT OF RISK LEVEL AND GROUP SIZE ON STUDENT PHONEMIC AWARENESS ACHIEVEMENT

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VITA

Nichole K.U. Baugh, daughter of Brian K. Nakano and Susan M. Ruidas, was born September 8, 1968, in Minneapolis, Minnesota. She graduated from Maui High School, Hawaii in 1986. She then graduated from The University of Hawaii in 1992 with a Bachelor of Arts in Elementary Education. She earned a Master of Education degree in Early Childhood Education from Columbus State University in Columbus, Georgia in 2000. She has taught elementary school for 13 years, six in Hawaii and seven in Georgia.

DISSERTATION ABSTRACT

THE EFFECT OF RISK LEVEL AND GROUP SIZE ON STUDENT PHONEMIC AWARENESS ACHIEVEMENT

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Doctor of Philosophy, December 16, 2005
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(B.A., The University of Hawaii, 1992)

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The purpose of the study was to determine if small group phonemic awareness intervention results in equal or greater phonemic awareness achievement than one-to-one tutoring dependent on a students risk level for reading failure. The study involved 100 kindergarten students who were divided into two types of instructional groupings: one-to-one and one-to-four. Pre-test scores were used to classify the students by initial risk level: low risk, some risk, and at risk.

Data analysis indicated that there was a statistical difference between the achievement of students who were assigned to the one-to-one and one-to-four groups. Analysis of data examining the effect of initial risk level on student achievement in phonemic awareness revealed that though the ability gap was not closed between the at

risk students and the low risk students, the majority of the students initially considered at risk concluded the study above the at risk category.

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I. INTRODUCTION

Many students, but not all, enter kindergarten with a wealth of background knowledge about how words work. This knowledge has developed as caregivers read to them and encouraged them to play with words. This word play includes rhyming with words like *sun* and *fun* and alliteration with words like *sing* and *song*. These rich literacy experiences create a positive foundation for future growth in reading. But what happens to the students who miss out on these experiences before they enter kindergarten? Can they possibly catch up to their better-prepared peers? A number of studies have shown that explicit phonemic awareness instruction benefits all students, but can especially help those who have not had the advantage of a rich literacy background (Chard & Dickson, 1999; Iverson & Tunmer, 1993; Yopp & Yopp, 2000). To add to current knowledge of both effective and efficient methods of phonemic awareness instruction, this study examined the effect of initial risk level and instructional grouping size on students' achievement in the context of explicit phonemic awareness instruction.

Phonemic awareness is a subcategory of phonological awareness. While phonological awareness includes recognition of sentences and words in spoken language, phonemic awareness involves working with individual sounds, or phonemes, within spoken words (Allor, Fuchs, & Mathes, 2001; Snider, 1997; Wasik, 2001; Yopp, 1992). Phonemes are the smallest unit of sound that makes a difference in a word's meaning (Torgesen & Mathes, 2001). Although mature language users may not consciously attend to individual phonemes in words, beginning readers and spellers need to be consciously

aware of phonemes for phonics instruction to make sense (Liberman & Shankweiler, 1985; Richgels, 2001; Tunmer, Herriman, & Nesdale, 1988).

Phonemic awareness includes a variety of skills. Phoneme isolation is the ability to recognize individual sounds in words. For example, the word *pan* begins with the /p/ sound. Phoneme identity includes the ability to identify spoken words with the same sounds like *man*/*mouse*, *sat*/*mat*, and *mat*/*can*. Phoneme categorization is the ability to recognize the word with the odd sound in a sequence of oral words. For example, in the list *cat*, *can*, *rag*, and *car*, the word with the different initial phoneme is *rag*. Phoneme blending is the ability to take individual phonemes and blend them together to create a word. For example, the phonemes /s/ /a/ /t/ can be blended to form the word *sat*. Conversely, phonemic segmentation is the ability to take spoken words and break them into individual phonemes. For example, the word *man* can be broken into individual phonemes /m/ /a/ /n/. Phoneme manipulation is the ability to delete, substitute, or add individual phonemes to spoken words. The phoneme /m/ can be taken away from the word *mat* to create the word *at*. The /m/ in *mat* can be substituted with the phoneme /s/ to create the word *sat*. Adding the phoneme /s/ to the beginning of the word *cat* will create the word *scat*.

Some students develop phonemic awareness skills naturally as they are immersed in a rich language environment filled with books, poetry, songs, and conversation. Students who enter school with limited opportunities to develop these abilities find themselves playing a game of catch up with their more prepared peers. Research summarized by the National Reading Panel (2000) indicates that explicit phonemic awareness instruction is effective for all children, including those who are at risk for

future reading problems, disabled readers, and normally progressing preschoolers through first graders. Explicit phonemic awareness instruction has also been shown to help improve reading skills for children from various socioeconomic and diverse language backgrounds (National Reading Panel, 2000).

Researchers have identified several features of effective phonemic awareness instruction. Phonemic segmentation, blending, and manipulation are the most difficult phonemic awareness skills for children to accomplish, but they are also the best predictors of reading success (Berg & Stegelman, 2003; Snider, 1997; Vandervelden & Siegel, 1995). Explicit instruction that includes an emphasis on these skills has been shown to have a strong effect on beginning reading ability (Davidson & Jenkins, 1994; O'Connor, Jenkins, & Slocum, 1995; Oudeans, 2003). Students who struggle most with these tasks require intervention that includes more instruction and practice than their more prepared peers. Phonemic awareness intervention is most effective when the teacher-student ratio is low (Davidson & Jenkins, 1994; Hurford, 1990; Walpole, Justice, & Invernizzi, 2004). What is unclear is whether phonemic awareness intervention is more or similarly effective in a small group or one-to-one setting. This research question is important because the answer may have a substantial impact on teachers' use of instructional time and methods for delivering phonemic awareness instruction.

Several studies have documented the effectiveness of phonemic awareness instruction in one-to-one tutoring sessions (Bloom, 1984; Iverson & Tunmer, 1993; Slocum, O'Connor, & Jenkins, 1993; Vaughn, Linan-Thompson, Kouzekanani, Bryant, Dickson, & Blozis, 2003); other studies have documented the effectiveness of phonemic awareness instruction in small groups (Chard & Kameenui, 2000; Cooper, MacGregor,

Smith, & Robinson, 2000; Fox & Routh, 1984; Walpole, Justice, & Invernizzi, 2004). According to the report of the National Reading Panel (2000), "The next step for researchers is to determine experimentally, whether small group instruction is indeed a better way to teach phonemic awareness than individual and classroom instruction and, if so, the process and conditions that make this approach especially effective" (p. 2-44).

Purpose of the Study

The first goal of this study was to determine if phonemic awareness intervention is effective for all students regardless of their initial risk level for reading failure. At risk students were selected using the indicated benchmarks for two pretest scores on the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) test (Good & Kaminski, 2002). Students were considered at risk if they scored below the benchmark on both pretests. Students were considered some risk if they scored below the benchmark on one, but not both pretests. Students were considered low risk if they scored above benchmark on both pretests.

The second goal of this study was to determine if small group phonemic awareness intervention results in less than, equal to, or greater achievement than one-to-one tutoring when curriculum and instruction are held constant. For this study, intervention was defined as phonemic awareness instruction that supplemented classroom instruction. Small group intervention was defined as a teacher-student ratio of one to four. Twenty-two pre-service teachers trained by the researcher provided intervention in phonemic awareness for all of the kindergarten students participating in the study.

The following research questions provided a focus for comparing phonemic awareness achievement among groups in this study:

1. Is there a significant difference in phonemic awareness achievement by initial risk level?
2. Is there a significant difference in phonemic awareness achievement by group size?
3. Is there a significant interaction effect (initial risk level by group size) on phonemic awareness achievement?

Research Context

The study was conducted during the first semester of the 2004-2005 school year in an elementary school located in midwestern Georgia. The school was home to approximately 850 students in grades pre-kindergarten through five. There were seven kindergarten classrooms in the school. Veteran teachers with over 20 years of experience taught in three of the classrooms. A teacher with 13 years experience taught in one classroom and three teachers who had less than 3 years experience each taught in the remaining three classrooms. Two of the kindergarten teachers had earned specialist degrees in early childhood education, one was a doctoral student in reading, and four had obtained bachelor degrees in early childhood education. Each teacher had a full time paraprofessional. All classrooms included students identified as at risk and in need of phonemic awareness intervention at the beginning of the school year. To control for teacher effect, students were randomly assigned to intervention groups.

The intervention implemented in this study followed the research-based curriculum for phonemic awareness instruction in the system's adopted language arts textbook. All kindergarten students participated in whole group phonemic awareness instruction with their classroom teachers each morning. On Monday, Wednesday, and

Friday, the students participated in a phonemic awareness intervention. This second dose of phonemic awareness instruction occurred in either a small group (1:4) or a one-to-one tutoring session. Pre-service teacher candidates from the local university conducted all intervention sessions. All intervention sessions lasted for a 20-minute period.

Significance of the Study

This study contributed to a greater understanding of the impact group size has on phonemic awareness instruction used as an intervention for high and low risk students. Previously, limited research had investigated the effects of grouping on effective phonemic awareness instruction. Most of the existing studies investigated combinations of instructional treatments and group size rather than holding instruction and curriculum constant and varying only group size. Most of these studies focused their attention on low achieving students rather than average and high achieving students. Results of this study offer teachers and administrators important information as they weigh the pros and cons of small group intervention instruction and more costly one-to-one tutoring.

Overview

Chapter II offers a review of related literature on phonemic awareness, phonemic awareness instruction, instructional grouping, and risk level. Chapter III provides detailed information regarding the overview of the study including assessments, student selection, and data collection. Chapter IV presents the data analysis and results addressing the effect of initial risk level and grouping on explicit phonemic awareness instruction. Chapter V concludes with a summary of the study, discussion of the results as they relate to each research question and previous research, implications for further

research into grouping and phonemic awareness instruction, and the implications and recommendations for current teaching practice.

Definitions of Terms

Phonemic awareness – the ability to hear, reflect on, and manipulate the individual sounds in oral words (Byrne & Fielding-Barnsley, 1991; Richgels, 2001; Torgesen, Morgan, & Davis, 1992; Williams, 1984).

Phonological awareness – awareness of the sound structure in oral language (Castle, Riach, & Nicholson, 1994; Torgesen, Wagner, & Rashotte, 1994).

Phonemic segmentation – the ability to break spoken words into individual sounds (Snider, 1997).

Phonemic blending – the ability to blend individual sounds into spoken words (Snider, 1997).

Small group intervention – for this study, a group of four students receiving a second dose of classroom phonemic awareness instruction from one pre-service teacher candidate.

One-to-one tutoring – for this study, one student receiving a second dose of classroom phonemic awareness instruction from one pre-service teacher candidate.

II. REVIEW OF RELATED LITERATURE

This chapter focuses on a synthesis of current research of the following topics: phonological awareness, phonemic awareness, phonemic awareness instruction, instructional grouping, and risk level.

Phonological Awareness

Phonological awareness is generally defined as one's sensitivity to, or explicit awareness of, the words in one's language (Castle, Riach, & Nicholson, 1994; Torgesen, Wagner, & Rashotte, 1994). Basic knowledge of sentences, whole words, and syllables in spoken language are the domain of phonological awareness (Richgels, 2001). Phonological processing tasks do not involve written letters or symbols. Instead, students are asked to manipulate speech segments such as words, syllables, and sounds that have been presented orally (Wagner, Torgesen, Laughon, Simmons, & Rashotte, 1993).

Beginners initially practice phonological skills by recognizing that spoken sentences are made up of individual words (Snider, 1997). Students are then encouraged to recognize and create rhymes and alliteration. For example, the teacher might ask the students if the words *can* and *man* rhyme. After the students are able to hear the similarities and patterns in words, they are asked to create a pattern on their own. For example, the student may be asked to give a word that rhymes with *sit* or provide any two words that rhyme (Griffith & Olson, 1992). Research establishes that a positive relationship exists between the ability to rhyme and recognize word parts and reading achievement (Bryant, MacLean, Bradley, & Crossland, 1990; Nation & Hulme, 1997,

Stahl & Murray, 1994). Alliteration involves identifying words that have the same initial sound. For example, given the words *man* and *mouse*, the student would be asked to name another word that begins with /m/.

Under the umbrella of phonological awareness resides the concept that individual words are made up of smaller units of sound called phonemes (Allor, Fuchs, & Mathes, 2001; Snider, 1997; Wasik, 2001; Yopp, 1992). A student's ability to identify individual phonemes in words and manipulate them successfully is dependent on their sensitivity to rhyme and alliteration (Bryant, MacLean, Bradley, & Crossland, 1990). This branch of phonological awareness is called phonemic awareness. Unlike other more general levels of phonological awareness such as rhyming and separating words into syllables, phoneme awareness is the level of phonological awareness that is most predictive of student's ability to learn and use the alphabetic principle as a foundation for beginning to read an alphabetic language (Torgesen & Mathes, 2001).

Phonemic Awareness

Phonemes are defined as the smallest unit of sound in language that makes a difference in meaning (Torgesen & Mathes, 2001; Wasik, 2001; Yopp & Yopp, 2000). Phonemic awareness is defined as the explicit awareness of the phonological structure of the smallest subword units in one's oral language (Byrne & Fielding-Barnsley, 1991; Richgels, 2001; Torgesen, Morgan, & Davis, 1992; Williams, 1984). The understanding that oral words are made up of individual sounds or phonemes creates the basis for successful manipulation of those phonemes and is a predictor of future reading success (Allor, Fuchs, & Mathes, 2001; Gonzalez, Espinel, & Rosquete, 2002; Stanovich, Cunningham, & Carmer, 1984).

Beginning phonemic awareness skills include isolation and identity of phonemes in words. For example, a child who notices the /g/ sound in *dig* is the same as the final sound in *frog* can usually also recognize that the /p/ sound in *pig* is the same initial sound that is in *pan*. Phoneme categorization is also included in beginning phonemic awareness exercises by encouraging the student to choose the odd word from a given list. For example, in the list *man*, *mud*, *girl*, and *moose*, the word *girl* does not belong because it starts with the /g/ sound (Snider, 1997).

More advanced phonemic awareness activities include blending and segmenting. Phonemic blending is characterized by the student's ability to take individual phonemes and blend them together. For example, given the phonemes /s/, /i/, /t/, the child is able to create the word *sit*. Conversely, in segmenting, the student would be given the word *sit* and asked to segment the word into the individual phonemes /s/, /i/, /t/ (Snider, 1997). The ability to blend and segment phonemes is the best early predictor of reading success (Fox & Routh 1976; Share, Jorm, MacLean, & Matthews, 1984).

The most difficult phonemic awareness tasks are substituting and deleting phonemes in words (Slocum, O'Connor, & Jenkins, 1993). For example, the phoneme /k/ can be taken from the word *cat* and leave the word *at*. The same /k/ in *cat* can also be replaced with a /f/ to create the word *fat*. Research has shown that phonemic awareness skills continue to develop as students learn to decode printed words. Manipulation skills are connected to a student's growing ability to decode simple words (Juel, 1988; Slocum, O'Connor, & Jenkins, 1993; Tunmer & Nesdale, 1985; Vellutino, 1991).

Phonemic awareness is critical to beginning readers. Many mature language users are not consciously aware of individual sounds in spoken language; however, students

who are learning to read and spell need to be able to focus on individual phonemes for phonics instruction to make sense (Berg & Stegelman, 2003; Groff, 2001; Liberman & Shankweiler, 1985; Richgels, 2001; Tunmer, Herriman, & Nesdale, 1988). Phonemic awareness makes the mapping of spoken words on to printed words, the goal of phonics instruction, understandable (Griffith & Olson, 1992; IRA, 1998; Murray, 1998; Torgesen & Mathes, 2001; Vellutino, 1991). Students who are taught individual phonics skills without the foundation of phonemic awareness often cannot generalize beyond the learned skills (O'Connor, Jenkins, & Slocum, 1995; Wasik, 2001). Research has indicated that students who do not acquire phonemic awareness skills naturally can benefit from and may need explicit, systematic, and intensive instruction (Center, Freeman, & Robertson, 2001; Rashotte, McPhee, & Torgesen, 2001; Scanlon & Vellutino, 1997; Weisberg, Andracchio, & Savard, 1989).

Phonemic Awareness Instruction

Students need varying degrees of instruction to develop in-depth understandings of the alphabetic principle or how spoken words are mapped on to printed words. For those students who lack a firm basis in phonemic awareness, instruction that is explicit, systematic, and intensive needs to be offered in addition to the regular curriculum (Chard & Dickson, 1999; Davidson & Jenkins, 1994; Hurford, 1990; Liberman & Shankweiler, 1985). Although students who struggle with phonemic awareness need to receive supplemental, direct instruction that includes all areas of phonemic awareness, this instruction should not dominate the curriculum. Struggling students also need exposure to rich literature and instruction in comprehension strategies (Berg & Stegelman, 2003).

A study conducted by Davidson and Jenkins (1994) suggested that phonemic blending and segmenting should be taught explicitly and in combination to young students so that the learned reading skills can be generalized. These researchers divided 79 kindergarteners into four instructional groupings:

1. Segmentation instruction – Each group of four students learned to orally segment words into individual sounds. The trainer assessed each student after every other session until all the students performed the trained items correctly.
2. Blending instruction – Each group of four students learned to blend individual phonemes presented by the instructor. The students were presented with separate sounds in a CV combination and asked to "say it fast." The same words were used for both the segmentation and blending training.
3. Segmentation-and-blending instruction – Each group of four students learned to segment, then to blend the words back together. The instructor reviewed segmenting during the blending part of the instruction.
4. Control – The students in the control group convened in small groups and had stories read to them during the instructional period. The control group did not receive any direct instruction in phonemic awareness activities.

The study found no evidence of transfer from blending to segmenting if the skill was not explicitly taught. The students who were taught blending alone were not able to perform any other skill besides blending and performed similarly to the uninstructed control group on the segmenting and word reading transfer tasks. Interestingly, the students who were taught segmenting and those who were taught both segmenting and blending were able to outperform the control group on word reading transfer. The

researchers hypothesized that though blending is a key strategy in reading, when a student decodes a word while looking at print, they first need to segment the word into individual phonemes before blending can take place. Torgesen, Morgan, and Davis (1992) explained that phoneme segmentation is equivalent to phonological analysis whereas phoneme blending is equivalent to phonological synthesis. If this idea is correct, it would make sense that the ability to analyze (segment) would need to occur before the ability to synthesize (blend) could take place. Davidson and Jenkins (1994) also suggested that effective instruction should be deliberately planned and include instruction of a variety of phonemic awareness skills that include blending and segmenting.

Phonemic awareness instruction should be intentional, not incidental, especially for kindergarten children who cannot perform phoneme awareness tasks such as blending and segmenting. The key to effective phonemic awareness intervention is creating a deliberate and purposeful supplement to the regular classroom curriculum (Rashotte, MacPhee, & Torgesen, 2001; Yopp & Yopp, 2000). A study by O'Connor, Jenkins, and Slocum (1995) implemented deliberate, purposeful, and explicit instruction in phonemic awareness with 10 weeks of blending and segmenting training. During the last five weeks of the training, the researchers added three minutes of letter-phoneme correspondence instruction to each lesson. The students received a total of 30 minutes of letter-phoneme correspondence instruction. The researchers found an improvement in the student's ability to orally segment and blend phonemes, but no effect on letter naming ability or decoding. The results suggested that though explicitly training students in blending and segmenting skills improved phonemic awareness ability, it had little effect on letter-phoneme correspondence skills. A study by Murray (1998) also found a

significant difference between groups who were taught phoneme identity and phoneme manipulation skills, but little difference between the groups in letter-phoneme correspondence skills.

Murray's (1998) study involved 48 kindergarten students from various socioeconomic backgrounds. The students were familiarized with eight phoneme identities during 15 instructional sessions. The students were introduced to eight letter-phoneme correspondences in the final session that would appear in posttest materials. A phonetic cue-reading test assessed the student's ability to connect the first printed letter on a flashcard to the phoneme that had been taught. Murray's (1998) version of the phonetic cue reading assessment utilized rhyming words. For example, the evaluator would show the student the word *CAT* and ask the student if the word is *mat* or *cat*? Using their knowledge of letter-phoneme connection, the student would deduce that *cat* was the correct choice, not *mat*.

O'Connor, Jenkins, and Slocum (1995) and Murray (1998) found that the students who were trained in phoneme blending and segmentation were better at oral phoneme manipulation than those who were trained in phoneme identity alone. The studies found that explicit instruction in phonemic awareness improved the children's ability to accomplish phonemic awareness tasks, but because both studies did not provide extensive explicit instruction in phonics (mapping phonemes on to printed letters), there was little if any effect on the student's immediate decoding skills. Other research has suggested that without deliberate explicit instruction in phonemic awareness and phonics, most students will not make the letter-phoneme connection (Iverson & Tunmer, 1993; Liberman & Shankweiler, 1985; Weisberg, Andracchio, & Savard, 1989).

Iverson and Tunmer (1993) found that adding an explicit phonemic awareness instructional component to the traditional Reading Recovery program helped students exit the program earlier. Reading Recovery was developed by Dr. Marie Clay in the 1970's to deal with reading failure in New Zealand. Dr. Gay Su Pinnell and Dr. Charlotte Huck introduced it in the United States through Ohio State University in 1984. The program provides one-to-one tutoring in 30-minute daily sessions for a span of 12-17 weeks. Reading Recovery claims to bring the lowest performing children up to the average level of their better performing peers. A trained Reading Recovery teacher who, working full-time, serves five to eleven students a year administers the instruction. Iverson and Tunmer (1993) combined a Traditional Reading Recovery program with current research on effective reading instruction, including explicit and systematic phonemic awareness and phonics training. The researchers hypothesized that the students who were selected for Reading Recovery would learn to read more quickly if they received explicit and systematic instruction that made them aware of the relationship between visual patterns and sounds in words. The Traditional Reading Recovery program does not explicitly or systematically teach word level skills; rather, Clay (1985) suggested that individual phonemes and letters are learned through reading and writing of text (Clay, 1985). Iverson and Tunmer's (1993) study included three treatment groups: a Traditional Reading Recovery program (one-to-one instruction), a Modified Reading Recovery program (one-to-one instruction), and a Standard Intervention program (six to seven students per group).

The Traditional Reading Recovery students received one-to-one tutoring for 30 minutes five days a week with a trained Reading Recovery teacher. The Modified

Reading Recovery students also received one-to-one tutoring five days a week with a certified reading specialist familiar with Reading Recovery procedures. Both the Traditional and Modified Reading Recovery sessions included the following activities:

1. Rereading of two or more familiar books
2. Independent reading of the preceding lesson's new book while the teacher takes a running record
3. Letter identification with plastic letters (in Traditional Reading Recovery this is only done if necessary)
4. Writing a story that includes using Elkonin boxes to hear sounds in unfamiliar words
5. Reassemble of a cut-up story
6. Introduction of a new book
7. Reading of the new book

The Traditional Reading Recovery students received instruction in letter identification until all letters were mastered. Extra time was given to word analysis prompted by the student's responses during the lesson. The Modified Reading Recovery differed from the Traditional only in the letter identification step. Explicit instruction in letter-phoneme patterns was substituted for letter identification activities after the student was familiar with at least 35 letter names. The goal of the Modified Reading Recovery program was to make the student aware of visual and phonemic word patterns thus increasing their phonemic segmentation skills. A focus word was chosen from the prior lesson and used to teach the student about word patterns. The activities began with initial

sounds and letters and moved toward final and medial sounds as the student mastered each skill.

The Standard Intervention group worked in small groupings of six to seven readers using a program already set up in the schools as a federally funded Title I program. The students were grouped by ability and met four days a week. The Standard Intervention teachers were reading specialists without a background in Reading Recovery instruction.

The students were pretested and posttested using a diagnostic survey that included six items: letter identification (name or sound of capital and lowercase letters), concepts of print (book knowledge), word recognition (15 frequently occurring words), writing vocabulary (write all known words), dictation (ability to record sounds in given words), and reading ability (running record). The students were also administered four additional instruments: a Dolch word recognition test (220 high-frequency words), the Yopp-Singer phoneme segmentation test (segmenting phonemes of given words), a phoneme deletion test (deleting phonemes in oral words), and a pseudoword-decoding task (decoding nonsense words).

The Modified Reading Recovery students made better gains than the standard intervention students, but did not outperform the Traditional Reading Recovery students in posttesting. However, the Modified Reading Recovery students could be discontinued from the program much earlier than those in the Traditional Reading Recovery program. The researchers hypothesized that the systematic phonemic component of the Modified Reading Recovery resulted in an improvement of phonemic segmentation skill and larger

transfer to reading tasks than the more implicit practice of Traditional Reading Recovery. The researchers felt that instruction in phonemic awareness after the reading of familiar material was ideal because the student was able to use familiar text to learn new concepts. Iverson and Tunmer (1993) pointed out that explicitly teaching patterns outside of text may actually increase fluency because the instruction does not interrupt the flow of reading as much as when the teacher stops the student to address a word analysis skill in the middle of a passage.

Many studies have suggested that although explicit instruction is vital, the role an effective teacher plays in student achievement is critically important. All groups in the Iverson and Tunmer (1993) study were led by certified reading specialists, but the curriculum and teacher expertise was not held constant. The traditional and Modified Reading Recovery students received explicit instruction from Reading Recovery trained teachers while the standard intervention group received instruction from a reading specialist without Reading Recovery training. Iverson and Tunmer (1993) indicated that because the teachers of the modified and traditional reading recovery groups were both certified reading specialists and trained in Reading Recovery, the additional training and experience enabled them to implement the Reading Recovery program more effectively.

Center, Freeman, and Robertson (2001) argued that modifying the current Reading Recovery program was just the first step to creating a nation of readers. These researchers created a study based on Iverson and Tunmer's (1993) Modified Reading Recovery instructional model. They theorized that a program like Reading Recovery could not be entirely successful if the reform did not include the student's regular classroom. They investigated the effect that a Johns Hopkins University program, School

wide Early Language and Literacy (SWELL), had on a Modified Reading Recovery program.

The SWELL program (Center, Freeman, & Robertson, 2001) was implemented in classrooms where students were being served by a Reading Recovery program that was created to be a complement to the regular classroom curriculum. The first year of the program included three phases. The first few months included an emphasis on language and listening comprehension teamed with early phonological awareness instruction. The emphasis then shifted to explicit instruction in phonemic awareness and phonological recoding. When most sound-symbol correspondences had been taught and practiced in connected text, the emphasis was redirected to explicit instruction in listening and reading comprehension skills.

Results of the study showed that the students in the SWELL classrooms significantly outperformed the students who experienced the same Modified Reading Recovery program in a classroom that was not using the SWELL program. The results confirm that students identified as at risk or hard-to-teach need explicit reading instruction throughout the school day, not just during a short intervention period. Interestingly, Berg and Stegelman (2003) and O'Connor, Jenkins, and Slocum (1995) found that as little as 15-30 minutes a day, three times a week is sufficient for most students to become phonemically aware. The National Reading Panel (2000) suggested that the entire phonemic awareness program should take no more than 20 hours before the onset of phonics instruction.

Instructional Grouping

Many studies have shown that one-to-one supplemental instruction, like the Reading Recovery program, is effective in remediation of students who are at risk for reading failure (Clay, 1977; Hurford et al., 1994; Iverson & Tunmer, 1993). Other studies suggested that small groups of students working on specific foundational reading skills are effective (Foorman & Torgesen, 2001; Lou, Abrami, & Spence, 2000; Taylor, Pearson, Clark, & Walpole, 1999). Finally, other studies have shown little difference between the two types of groupings (O'Connor, 2000; Vaughn, Linan-Thompson, Kouzekanani, Bryant, Dickson, & Blozis, 2003).

The Reading Recovery program is one of the most controversial programs in reading education today. Proponents say that it is the best available program for preventing reading failure. The most heated discussion around Reading Recovery today is not about the effectiveness, but the cost. Reading Recovery advocates and critics agree that Reading Recovery or one-to-one tutoring is not a feasible solution for providing effective reading instruction to all students and improving the overall reading performance of a school as a whole (Grossen, Coulter, & Ruggles, 1997). The National Reading Panel (2000) suggested that the effect sizes of studies that focused on one-to-one tutoring were as effective as those that focused on small group or one-to-four instruction.

In their meta-analysis of current research, The National Reading Panel (2000) found that small group instruction was associated with larger effect sizes than individual or whole group classroom instruction. This outcome was discovered across studies and not as an outcome of studies that manipulated group size as a variable. The National Reading Panel (2000) indicated that more research needed to be conducted to evaluate

the effectiveness of small group instruction versus one-to-one or whole group instruction. The Panel also indicates that expanded research needs to focus on effective instruction in various group settings.

Fox and Routh (1984) and Rashotte, MacPhee, and Torgesen (2001) found that direct and explicit phonemic awareness instruction in a small group setting was successful. Both studies involved small group instruction consisting of four to six students per group. Instruction consisted of direct training of blending and segmenting phonemes. Fox and Routh (1984) studied kindergarteners while Rashotte, MacPhee, and Torgesen (2001) looked at grades first through sixth. Rashotte, MacPhee, and Torgesen (2001) compared their effect sizes with studies that measured the effect sizes of one-to-one intervention (Elbaum, Vaughn, Hughs, & Moody, 2000; Wasik, & Slavin, 1993). Surprisingly, the comparison found that small group instruction was as effective, if not better, than one-to-one tutoring. Rashotte, MacPhee, and Torgesen (2001) advocated small group intervention that includes phonemic awareness implemented in a direct and explicit manner. They further suggested that programs like Spell Read Phonological Auditory Training (MacPhee, 1990), which are implemented in small groups, are more cost effective than current Reading Recovery programs. However, they concurred with the National Reading Panel (2000) by calling for more research that compares the effectiveness of one-to-one and small group instruction.

A study by Vaughn, Linan-Thompson, Kouzekanani, Bryant, Dickson, and Blozis (2003) looked at the difference in student achievement between different groupings using the same curriculum. The study included 90 second-graders who were divided into three types of groupings: one-to-one, one-to-three, and one-to-ten. The researchers

hypothesized that one-to-one group instruction would be more effective because there are studies that have shown the effectiveness of individual instruction (Clay, 1985; Elbaum, Vaughn, Hughs, & Moody, 2000; Iverson & Tunmer, 1993; Wasik & Slavin, 1993). The researchers investigated the differences in student achievement in comprehension, phoneme segmentation, reading fluency, and word attack skills in relation to group size. All of the participants were struggling readers and all received intensive and explicit reading instruction. Though phonemic awareness was not the sole focus, findings showed increased phoneme segmentation performance in all three groupings; however, the one-to-one and one-to-three groupings consistently outperformed the one-to-ten group on each posttest measure.

In the study by Vaughn, Linan-Thompson, Kouzekanani, Bryant, Dickson, and Blozis (2003), there was no statistical significance between the one-to-one, one-to-three, and one-to-ten groups in word attack skills; however, posttest scores on the Texas Primary Reading Inventory (TPRI) showed that 39% of the one-to-one group participants and 46% of the one-to-three group participants were able to pass after receiving instruction, while 7% of the one-to-ten group participants passed the same assessment. On the TPRI there was no significant difference between the one-to-one and one-to-three groupings in passage comprehension or phoneme segmentation. The one-to-one group outperformed the one-to-three and one-to-ten group on the reading fluency assessment, the ability to read a text piece at an appropriate rate. Their findings suggested that struggling readers benefit more from intensive and explicit reading instruction in one-to-one or small group interventions than in groups as large as ten.

Risk Level

Although phonemic awareness training has been proven effective for all students, regardless of skill level, explicit training has been found to be especially important for students identified as at risk (Chard & Dickson, 1999; Iverson & Tunmer, 1993; Yopp & Yopp, 2000). Although a variety of definitions for at risk exists, a consensus in current research indicates four common characteristics are used to describe a student who is at risk for reading failure: delayed speaking and listening vocabulary development, difficulty with phonological manipulation tasks (blending and segmenting), little or no knowledge of letter names or their corresponding phonemes, and an inability to read words from a Dolch list (Fox & Routh, 1984; Hurford, et al., 1994; Iverson & Tunmer, 1993; O'Connor, Jenkins, & Slocum, 1995; Slocum, O'Connor, & Jenkins, 1993). Of these four characteristics, phonological manipulation (including phonemic blending and segmenting) was most commonly used to identify students that were considered at risk.

O'Connor (2000) selected at risk students in a study that examined increasing intervention across a span of two years. Students were considered at risk if they named less than 15 letters in one minute, segmented fewer than four segments in 10 three-phoneme words, and had standard scores below 86 on the combined letter-word and dictation subtests of the Woodcock-Johnson Tests of Achievement (O'Connor, 2000). The intervention began with activities that encouraged the students to develop phonemic awareness skills and build their listening and speaking vocabularies. During the two years the students experienced an increased intensity of instruction and were involved in whole group and small group lessons that explicitly addressed their targeted weaknesses.

O'Connor (2000) found that the entry level skill of the student was not a good predictor of the student's future success in response to explicit instruction. This finding concurred with an earlier study done by O'Connor, Jenkins, and Slocum (1995) that suggested that low skilled children could be brought up to similar levels of higher skilled students with explicit instruction in phonemic manipulation. Their study suggested that higher skilled students continue to grow without specific training, while low skilled students need explicit instruction to reach the same levels (O'Connor, Jenkins, & Slocum, 1995).

Conclusion

Although research clearly supports explicit and systematic instruction for students who struggle with learning to read, questions still remain concerning the most appropriate group size for phonemic awareness intervention. This study examined the effect that initial risk level and grouping has on student achievement in the context of phonemic awareness intervention in kindergarten.

III. METHODOLOGY

The purpose of this chapter is to describe the design of the study. The chapter is divided into seven sections: purpose of the study, research design, setting and participants, description of instruments, description of the intervention, data collection, and data analysis procedures.

Purpose of the Study

The purpose of the study was to determine if small group phonemic awareness intervention results in equal or greater phonemic awareness achievement than one-to-one tutoring given the same explicit and systematic curriculum and instruction for students at various initial risk levels. Quantitative measures were used to compare the phonemic awareness achievement of students participating in small group and individual tutoring sessions. This study was designed to examine student achievement based on initial risk level and instructional group composition.

Research Design

A comparison group design with random assignment of participants to groups was used to examine the effects of phonemic awareness intervention on students participating in two types of instructional settings, one-to-one and one-to-four. A two-way analysis of variance (ANOVA) was employed for analysis of the data to examine the contrast of improvement for participants of this study.

Setting and Participants

This study was conducted in the second six weeks of the 2004-2005 school year. The research site was an elementary school within a metropolitan school district in the southeastern United States. The elementary school was one of 35 in the district, and the school had a population of 850 students in grades pre-kindergarten through fifth. Caucasians made up 81% of the school population while minorities, including African Americans, Hispanics, Asians, and those of mixed decent, made up the remaining 19% of the school's population. Seven regular education self-contained kindergarten classes took part in the study.

The seven classroom teachers of the participating students differed in their experiences and normal classroom routines. Though all the classrooms followed the same district-adopted reading curriculum, some of the teachers were very structured and systematic in teaching basic reading skills, while others taught reading more incidentally through exposure to literature. In addition, some of the teachers frequently utilized individual and small group instruction, while others depended primarily on whole group instruction.

The school had 142 kindergarteners enrolled on the first day of school. All families were given consent forms and an informational flyer during the school's registration period. The 114 students who returned a valid consent form were pretested using the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) Initial Sound Fluency (ISF) and Phoneme Segmentation Fluency (PSF) tests (Good & Kaminski, 2002). All pre- and posttesting was done by 22 pre-service teachers from the local university enrolled in a reading methods course.

The 22 pre-service teachers who participated in the study were juniors or seniors in an early childhood education program at a local university. Before the study, the pre-service teachers received two 1-hour training sessions on how to administer the DIBELS Initial Sound Fluency and Phoneme Segmentation Fluency tests. The researcher conducted the training. The pre-service teachers were given the opportunity to practice administering the test to peers in their class. During the second session the students were given additional training on phonemic awareness topics and explicit instruction pertaining to lesson delivery during the study. The researcher was available to the pre-service teachers during all testing and instructional sessions.

Participating kindergarteners were initially divided into three groups (low risk, some risk, at risk) by their scores on the pretests. The students were then assigned by random drawing to an instructional grouping based on the pretest scores. Students determined to be at risk (raw scores of 0 to 4 on the Initial Sound Fluency assessment and raw scores of 0 to 7 on the Phoneme Segmentation Fluency assessment) were randomly assigned to six one-to-one and five one-to-four groups. Students found to be at risk on either the Initial Sound Fluency assessment or the Phoneme Segmentation Fluency assessment, but not both, were termed some risk. These students were randomly assigned to six one-to-one and twelve one-to-four groups. Students were classified as low risk if they did not have an at risk score on either test. These students were randomly assigned to eight one-to-one and three one-to-four groups. Fourteen students with valid consent forms were not placed in any of the one-to-one or one-to-four groups for this study because of the limited number of pre-service teachers. These 14 students participated in similar treatment lessons administered by a pre-service teacher, but were not reported as

part of the study. The pre-service teachers were randomly assigned to the groups. They received no information about individual students other than student names and classroom numbers. See Table 1 for the group composition by initial risk level and instructional grouping.

Table 1

Student Group Assignments

Grouping	Total Groups	At Risk Students	Some Risk Students	Low Risk Students	Total Students
1:1	20	6	6	8	20
1:4	20	20	48	12	80
Total	40	26	54	20	100

The pre- and posttesting and instruction for this study was provided by 22 pre-service teacher candidates at a local university as a partial requirement of a beginning reading instruction course. The researcher provided two training sessions for testing and lesson delivery. The first session included a review of phonemic awareness activities and an introduction to the Initial Sound Fluency and Phoneme Segmentation Fluency pretests. The second training included a review of the pretest procedures and an introduction to the posttest form. During the sessions the pre-service teachers practiced test implementation with other pre-service teachers in their group. The researcher was available during each session to answer questions and observe the delivery of the lessons and testing.

Description of Instruments

DIBELS Initial Sound Fluency

The Dynamic Indicators of Basic Early Literacy Skills (DIBELS) Initial Sound Fluency (ISF) test is designed to assess a student's understanding of initial sounds in words. The test administrator shows the student a set of four pictures and asks the student to point to the picture that begins with the given sound. For example, the tester shows the student pictures of a *mouse*, *flowers*, a *pillow* and some *letters*. The tester then asks the student to point to the picture that begins with the /m/ sound. The student's score is equal to the number of correct responses in 60 seconds. As noted earlier, the ISF was given as a pretest before the treatment, and the pre-service teachers at the end of the study administered an alternate form of this test. The scores from both the pretest and posttest forms were compared and analyzed. For this study, initial risk level was based on the pretest scores and beginning of the year benchmarks that follow:

- 0 – 4 correct answers – at risk
- 4 – 8 correct answers – some risk
- 8 and above – low risk

DIBELS Phoneme Segmentation Fluency

The DIBELS Phoneme Segmentation Fluency test is designed to assess a student's ability to segment a spoken word into its individual phonemes. The pre-service teacher asked the student to break the orally presented word into individual phonemes. For example, the pre-service teacher would say the word *mop* and the child would respond with /*m*/ /*o*/ /*p*/. Each individual phoneme or letter sound is counted as one point.

The score is equal to the number of correct responses in 60 seconds. Phoneme Segmentation Fluency (PSF) pretest was administered by pre-service teachers before the treatment, and an alternate form of this test was administered at the end of the study. For this study, scoring was based on the mid-year benchmarks because DIBELS does not publish a benchmark for PSF for the beginning part of the school year in kindergarten. The benchmarks are as follows:

- 0 – 7 correct sounds – at risk
- 7 – 18 correct answers – some risk
- 18 and above – low risk

Description of Intervention

The interventions by the pre-service teachers supplemented the curriculum provided earlier by the classroom teacher in a whole group setting using the district-adopted Macmillan McGraw-Hill Reading Series (Flood et al., 2003). The intervention consisted of 16 sessions, 30 minutes each.

Each student or group of students was picked up by the pre-service teacher and taken to a set location (e.g., media center or cafeteria) for the intervention. Lessons for the one-to-one and one-to-four groups followed the same format.

The intervention lessons were delivered in sections. The beginning of each lesson focused on phonological skills including rhyming, syllables, and onset/rimes. The second part of the lesson focused on phonemic awareness skills including listening for beginning/ending sounds and blending individual phonemes. Each lesson began with the reading of a poem and identifying rhyming words in the poem. After the poem, the

students participated in phonological activities in which they practiced the following skills:

- Rhyming – The students listened for rhyming words in a given list, created words that rhymed with a given word, or created words that rhyme on their own.
- Identifying syllables – The students were asked to listen to words and clap out the number of syllables.
- Blending and segmenting onsets and rimes – Words were divided orally into the onset (everything before the first vowel) and the rime (the vowel and everything after it). For example, the word *man* would be divided into /m/ - /an/. The students then blended the word parts together to create the word *man*.
- Listening for sounds – The students were asked to listen to words and identify the sound they hear at the beginning or ending of a spoken word.

At the conclusion of the phonological activity, the students participated in a phonemic awareness lesson that consisted of the following skills:

- Listening for beginning sounds – "Does the word *apple* begin with the /a/ sound?" The student(s) would indicate whether or not the statement was correct by saying yes or no.
- Listening for ending sounds – "Raise your hand when you hear the /d/ sound at the end of the word."
- Blending individual sounds – "What word do these sounds make: /d/ /a/ /n/?" (*Dan*)

At the conclusion of the lesson, the pre-service teachers returned the students to their classrooms. The researcher was available to the pre-service teachers for questions and clarifications about the previously taught lesson as well as the lesson that was planned for the next session.

Data Collection

Pretest

Students were pulled out of their classrooms individually for the pretest by one of the pre-service teachers. The pre-service teacher held a short conversation with each student to create a comfortable environment before the tests were administered. The pre-service teacher reviewed an assent form with each student to make sure the student understood that the activities could be stopped at any time if the student was uncomfortable with the lesson. After reviewing the assent form, the student was asked to sign his/her name on the given line if he/she agreed to participate in the study. The pre-service teachers then administered the DIBELS Initial Sound Fluency and Phoneme Segmentation Fluency tests. Each test sheet was labeled with the student's first name and assigned number. At the end of the testing, the students were returned to their classrooms.

Posttest

The pre-service teachers administered all of the posttests to the student or students they had worked with throughout the study. This method was used to minimize possible student stress related to being tested by an unfamiliar teacher. Alternative forms of the DIBELS Initial Sound Fluency and Phoneme Segmentation Fluency tests were administered to each student individually. All forms were labeled with the students' first

names and assigned numbers. The pre-service teachers returned the students to their classrooms after the posttest was complete.

Data Analysis

A 2 x 3 (group size x initial risk level) analysis of variance (ANOVA) was employed to examine the effect of initial risk level and grouping on the student's initial and posttest risk level. The student's phonemic awareness achievement was derived from a combination of the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) Initial Sound Fluency (ISF) and Phoneme Segmentation Fluency (PSF) raw scores. Risk level at the onset of the study and posttest phonemic awareness achievement was determined by the following criteria:

3	at risk	Raw scores between 0 – 3 on ISF and raw scores between 0 – 6 on PSF
2	some risk	Raw scores between 4 – 7 on ISF and raw scores between 7 – 17 on PSF Note: students were also considered some risk if they scored in the at risk category on one, but not both of the indicators (ISF and PSF).
1	low risk	Raw scores of 8+ on ISF and raw scores of 18+ on PSF

The dependent variable for the ANOVA was phonemic awareness achievement. The independent variables were the initial risk level and instructional group size of the students. These analyses were used to determine which students were most affected by the phonemic awareness intervention treatments and which grouping, one-to-one or one-to-four, was more effective.

IV. DATA ANALYSIS AND RESULTS

The purpose of the study was to determine if small group phonemic awareness intervention results in equal or greater phonemic awareness achievement than one-to-one tutoring given the same curriculum and instruction. The National Reading Panel's meta-analysis of current research in phonemic awareness instruction indicated that small group and individual tutoring sessions yielded similar gains, while large group instruction produced much smaller growth. These findings, however, were not based on comparison studies, but on a comparison of multiple studies, each focusing on one type of group instruction.

Review of Research Questions

The following research questions provided a focus for comparing phonemic awareness achievement among groups in this study:

1. Is there a significant difference in phonemic awareness achievement by initial risk level?
2. Is there a significant difference in phonemic awareness achievement by group size?
3. Is there a significant interaction effect (initial risk level by group size) on phonemic awareness achievement?

Data Analysis

Descriptive statistics were computed to examine the significance of initial risk level and group size on phonemic awareness achievement. A two-way analysis of variance (ANOVA) was applied in this study to determine the effect of initial risk level, group size, and any interaction between the two variables.

A 3 X 2 ANOVA was conducted to evaluate the effects of three levels of initial risk and two levels of group size on improvement. The analysis examined the difference in phonemic awareness achievement based on these two independent factors. Phonemic awareness achievement was operationally defined using the following criteria:

3	at risk	Raw scores between 0 – 3 on ISF and raw scores between 0 – 6 on PSF
2	some risk	Raw scores between 4 – 7 on ISF and raw scores between 7 – 17 on PSF Note: students were also considered some risk if they scored in the at risk category on one, but not both of the indicators (ISF and PSF).
1	low risk	Raw scores of 8+ on ISF and raw scores of 18+ on PSF

The ANOVA indicated significance for student initial risk level, $F(2,97) = 11.56$, $p < .001$ (partial $\eta^2 = .192$). The means and standard deviations for initial risk level improvement as a function of the factors are presented in Table 2. Frequencies comparing pretest and posttest risk level are presented in Table 3.

Table 2

Means and Standard Deviations of Phonemic Awareness Achievement by Initial Risk Level

Risk Level	Posttest Scores	
	M	SD
Low Risk	1.48	.512
Some Risk	1.96*	.433
At Risk	2.12*	.526

Low Risk = 1 $\quad 1 < \text{Some Risk} \leq 2 \quad 2 < \text{At Risk} \leq 3$

*Significant at the .05 level from low risk

Table 3

Distribution of Phonemic Awareness Achievement by Initial Risk Level

Initial		Posttest		
Risk Level	#	# At Risk	# Some Risk	# Low Risk
Low Risk	21	0	10	11
Some Risk	54	4	44	6
At Risk	25	5	18	2

Follow-up tests were conducted to evaluate the three pairwise differences among the means for initial risk level, with alpha set at .016 to control for Type I error over the three pairwise comparisons. There was significant difference between the initial at risk and low risk students' phonemic awareness achievement. There was significant

difference between the some risk and low risk student's phonemic awareness achievement. However, there was no statistical difference between the some risk and at risk student's phonemic awareness achievement.

The ANOVA also indicated significance for group size, F (1,94) = 5.55, p = .021 (partial η^2 = .056). The results indicate that the students who participated in the one-to-one group intervention ended the study with a better achievement mean than those in the one-to-four groups. The means and standard deviations for group condition are presented in Table 4.

Table 4

Means and Standard Deviations of Phonemic Awareness Achievement by Group Size

Group Size	M	SD
1:1	1.64	.105
1:4	1.92	.060

Low Risk = 1 1 < Some Risk ≤ 2 2 < At Risk ≤ 3

The ANOVA indicated no significant interaction between initial risk level and group size, F (2,94) = .059, p = .763 (partial η^2 = .006). The results indicate that group size was not significantly related to initial risk level with respect to phonemic awareness achievement. Table 5 presents the distribution of phonemic awareness achievement by initial risk level and group size. These results indicate that there were initially 25 at risk students at the onset of the study. At the conclusion of the study only five of those initial at risk students remained in the at risk category. There were 18 students that improved from at risk to some risk, while two of the original at risk students improved to the low risk category. The results also indicate that though the at risk students experienced

success, four of the some risk and 10 of the low risk actually achieved below their initial placement.

Table 5

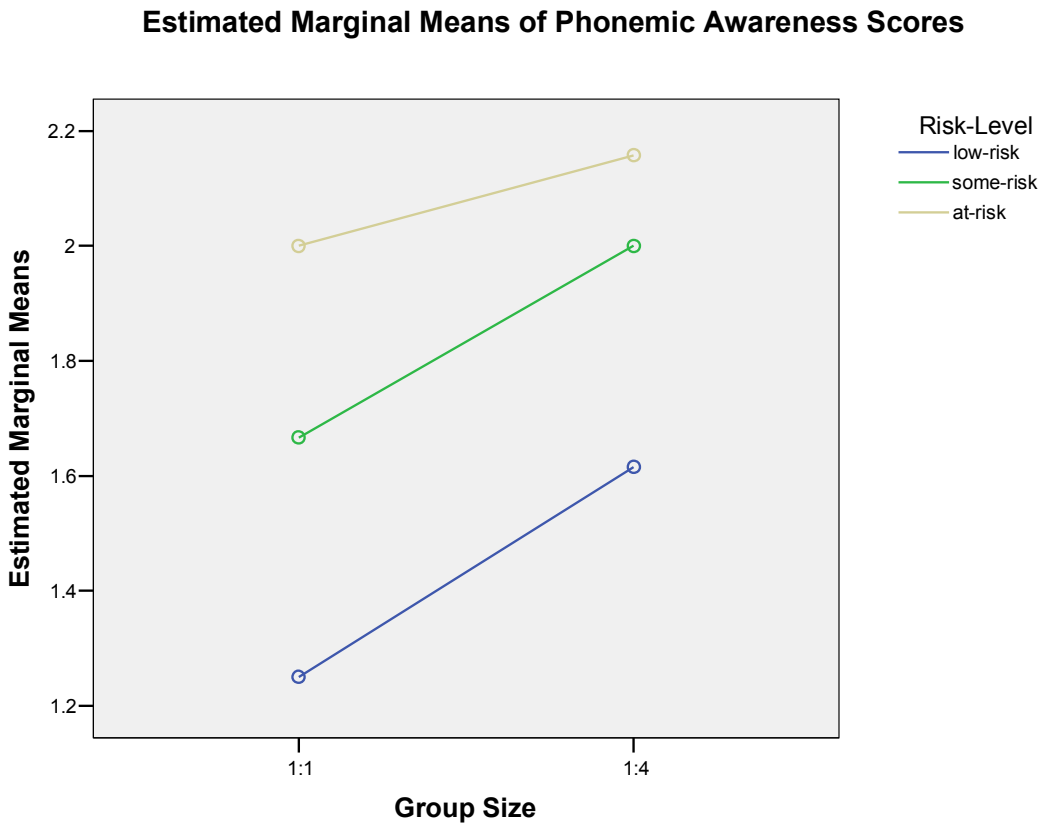
Distribution of Phonemic Awareness Achievement for Initial Risk Level and Group Size

Initial		Posttest		
Risk Level	#	# At Risk	# Some Risk	# Low Risk
Low Risk				
1:1	8	0	2	6
1:4	13	0	8	5
Some Risk				
1:1	6	0	4	2
1:4	48	4	40	4
At Risk				
1:1	6	0	6	0
1:4	19	5	12	2

Figure 1 presents an estimated marginal means plot illustrating the means for the one-to-one and one-to-four groups in relation to the student's initial level of risk. Although interaction effects means were not significantly different, the plot shows that the line slope for the at risk students is flatter than line slopes for some risk and low risk students. This graph suggests that further research is needed to examine possible differential effects of group size.

Figure 1

Means Plot for Instructional Group Size



Results

The focus of this study was to investigate the achievement of students who participated in phonemic awareness intervention instruction. The study analyzed the effect of the intervention for students at three different initial risk levels (low risk, some risk, and at risk). In addition to initial risk level, the study also investigated the influence of instructional group size (one-to-one and one-to-four).

Initial Risk Level

At the onset of the study 25 of the 100 participants were considered to be at risk. By the end of the study only five of those students were still considered at risk while 18 were considered some risk and two were classified low risk. Results indicated that at risk students did make impressive gains. However, despite these gains, at the end of the study a statistically significant gap remained between the achievement of students beginning the study as at risk and low risk.

As encouraging as the results were for at risk students, the some risk and low risk students did not make comparable gains. There were 54 some risk students who participated in the study. At the conclusion of the study 44 remained in the some risk group while six improved to low risk and four were now considered at risk. Though only four did not achieve at or above their initial level, the some risk students did not make the same gains that the at risk students did. There were 21 low risk students at the beginning of the study and 11 who were still considered low risk at the end of the study. Although there was a ceiling effect to consider, 10 low risk students were considered some risk by the end of the study.

These results clearly indicate that the treatment was more successful for those considered at risk at the onset of the study than it was for those considered some risk or low risk. Although the treatment did not bring the majority of at risk students to the level of the low risk students, 20 of the original 25 were able to achieve higher than the at risk category at the end of the study.

Group Size

Results indicated that there was a significant difference in phonemic awareness achievement by group size. Students in the one-to-one condition outperformed the students in the one-to-four condition. Means for these two groups were 1.64 and 1.92 respectively with a lower number representing a lower level of risk. Though the difference in these means is statistically significant, from the viewpoint of educational significance, both the at risk and some risk group means still fell within the some risk category at the conclusion of the study.

Initial Risk Level x Group Size

The data suggest that achievement may be differentially affected by group size. The means by initial risk level and group size were not significantly different. The means plot, however, suggested that one-to-one groups may have been more important for students initially classified as low risk and some risk than those initially classified as at risk. Most at risk students made impressive gains regardless of their assigned instructional group size.

V. SUMMARY, DISCUSSION, AND RECOMMENDATIONS

Summary of Study

This study examined the effect of initial risk level and group size on phonemic awareness achievement. Specifically, the study sought to determine whether or not a student's initial risk level had an impact on their achievement in phonemic awareness activities dependent on the size of their instructional group. Two-way repeated-measure analysis of variance (ANOVA) for the achievement of 100 children who participated in the study revealed significance in the achievement of students dependent on initial risk level. The ANOVA also found statistical difference between the achievement of students who were instructed in the one-to-one or one-to-four groups, but not as an interaction of both variables.

The following areas were examined during this study:

Initial Risk Level

At the end of the study, students who began the study as low risk remained at a statistically greater level of achievement than those who began as at risk. However, the statistical analysis did not adequately capture the educationally significant strides made by those initially classified as at risk. Of the 25 students considered at risk at the beginning of the study, 80% or 20 of those students had improved and were considered either some risk or low risk at the end of the study. Though the at risk students made larger gains than their peer groups, as a group they were not able to close the gap between

themselves and the students beginning in the low risk group. Since the majority of the students initially considered at risk were considered some risk at the end of the study, more intervention might be needed to bring them to the same level as the low risk students.

Unfortunately, the same improvement was not seen in the some risk students. Of the 54 students who were considered some risk at the beginning of the study, 44 of these students remained in the some risk category at the end of the study while six students improved to the low risk category and four students were then classified as at risk. The study took place during the first half of the kindergarten year when many students are working on reading readiness skills. Segmenting words into individual phonemes had not yet been explicitly taught in the classroom or during the treatment. Since segmenting words was one of the assessments used to determine phonemic awareness achievement, the some risk students, though working on grade level, may not have had sufficient instruction to help them improve.

The low risk students had limited gain potential during this study because of a ceiling effect. Of the 21 students who were considered low risk at the beginning of the study, 11 remained in the low risk category at the end of the study while 10 were considered to be some risk. None of the low risk students were classified as at risk at the end of the study. Though the low risk students could not improve their level of risk, it was not expected that almost half of them would end the study at a lower level of achievement than at the onset. This finding clearly suggests that the low risk and some risk students did not get as much from the intervention as the at risk students did.

Specifically, the phonemic awareness intervention seemed to be more effective for students who performed well below the benchmark before the treatment.

Group Size

This study found that instructional group size had a significant impact on student phonemic awareness achievement. As a whole, the students who were assigned to the one-to-one group treatment did better than those who participated in the one-to-four group treatment. None of the students who were assigned to the one-to-one group setting ended the study in the at risk category. This finding contrasts with the one-to-four group setting that began the study with 19 at risk students and ended with nine students remaining in the at risk category. Of the nine students who ended the study in the at risk category, only five were initially considered at risk, while the remaining four students began the study in the some risk category.

Though the results are statistically significant, educational significance must also be considered. The difference between the means for the one-to-one and one-to-four groups was 1.64 and 1.92 respectively. The means suggest that though there was a statistical difference between the assigned instructional groups, both the one-to-one and one-to-four settings produced means representing some risk (i.e., numbers between 1 and 2).

The means plot (see Figure 1) indicates that though the one-to-one instructional groups did better than those in the one-to-four instructional groups for all initial risk levels, the slopes for the some risk and low risk are decidedly steeper than those for the at risk groups. This trend would indicate that the grouping variable was more important for

students who were some risk or low risk at the onset of the study and less important for the at risk students.

The instruction that was delivered during the treatment focused on basic beginning reading skills. For the some risk and low risk students, who had already come close to or had accomplished the benchmark in phonemic awareness, this instruction was a review. The pre-service teachers who were delivering the intervention in a one-to-one setting may have tailored their instruction to the needs of the student, thus giving them an advantage over the some and low risk students in the one-to-four groups. Since the instruction was focused on basic beginning reading skills, the at risk students, who were at a deficit at the beginning of the study, were learning new concepts and making gains regardless of their assigned instructional group.

Initial Risk Level x Group Size

This study found no interaction effect between the initial risk level of the students and the instructional group size. Because of the small sample, 20 one-to-one groups and 20 one-to-four groups, the difference between groups and levels may not have been strong enough to be statistically significant.

Discussion of Findings

The results of this study suggest that phonemic awareness instruction in one-to-one tutoring sessions was statistically better than in one-to-four. The students who received one-to-one intervention achieved better phonemic awareness achievement than those in the one-to-four groups. The key finding of this study is that though the instructional group size had an impact on the achievement of the students, the initial risk level of the students was a better predictor of achievement in phonemic awareness as a

result of the intervention. Descriptive data clearly showed that the students considered at risk at the onset of the study made more substantial gains than those considered some or low risk. This study supports research that suggests at risk students need explicit, systematic, and intensive instruction to acquire skills that are not naturally at their ability level regardless of group size (Center, Freeman, & Robertson, 2001; Rashotte, McPhee, & Torgesen, 2001; Scanlon & Vellutino, 1997; Weisberg, Andracchio, & Savard, 1989).

The results of this study also concurs with other findings that suggest that students who are considered at risk can be brought to a level near their more prepared peers with additional explicit and systematic instruction (Chard & Dickson, 1999; Davidson & Jenkins, 1994; Hurford, 1990; Liberman & Shankweiler, 1985). A test of phoneme segmentation, breaking words into individual phonemes, was one of the two assessments that defined initial risk level. Though the at risk students began the study well behind the some risk and low risk students in their ability to segment words into individual phonemes, the majority were able to achieve at or near the benchmark on the posttest with explicit instruction in word part segmentation. Though the study did not last long enough to include instruction in phonemic level segmenting, the students were able to use syllable and onset/rime segmenting knowledge to approach the benchmark on that assessment.

Statistical analysis did not directly support small group intervention (Foorman & Torgesen, 2001; Lou, Abrami, & Spence, 2000; Taylor, Pearson, Clark, & Walpole, 1999), but descriptive data reveled interesting trends corresponding to these findings. The intervention group size was important to the students originally classified as low risk

and some risk at the onset of the study. Instructional group size was not important to the students who were classified as at risk at the onset of the study.

The National Reading Panel (2000) suggested that transfer to reading was greatest when 5-18 hours of phonemic awareness training was provided. The students in this study received approximately eight hours of supplemental explicit and systematic phonemic awareness instruction. This level of instruction may have been sufficient for the some risk and low risk students, but not for the at risk students. The study indicated that the at risk students may need more intervention time to improve from well-below to at-benchmark level.

Limitations

Pre-service teachers implemented the treatment in this study to minimize the impact of different experience levels of veteran and novice teachers within the grade level. Some differences were noted among the abilities of the pre-service teachers. Also, a general lack of experience may have influenced the amount of engagement that took place during the treatment.

The same pre-service teachers performed the pre- and posttesting on all the participants. In reflection, expert testers should have been used to validate the results and assure that the students were placed in the correct categories of risk levels at the onset of the study.

The pre-service teacher who delivered the intervention to that student did posttesting of each student. This was initially done to relieve anxiety on the part of the student, but there was opportunity for the pre-service teacher to inadvertently influence

the child to do better or worse on the test than if an assessor who did not know the child had administered it.

The intervention lessons were conducted throughout the school in hallways, the media center, breezeways, and courtyards. Not all settings were conducive to instruction and featured distractions not present in classrooms. Some settings may have hindered student learning and affected attention spans.

A ceiling effect may have occurred for the students identified as some risk and low risk at the onset of the study. Many of the students who were considered some risk or low risk achieved near or above the benchmark level on one or both of the Initial Sound Fluency and Phoneme Segmentation Fluency tests which were used to determine initial risk level. The initial scores of the some risk and low risk students left very little room for improvement compared to the students who were considered at risk at the onset of the study. Regression to the mean may have occurred.

Need for Further Research

The results of this study indicate a need for more research into grouping of at risk students for phonemic awareness instruction. The fidelity of this study was possibly compromised during the pre- and posttest because of the inexperience of the pre-service teacher testers. For this reason, a replication study that utilizes more secure testing would enhance the findings of the current study.

Further investigation into the grouping effectiveness for children who are identified as some risk and low risk is also needed to determine the most effective instructional group size for students at all levels. This study addressed phonemic awareness instruction at the basic level, which was at the instructional level for the at risk

students. What the study did not explore was the degree of instructional "tailoring" that occurred in the one-to-one and one-to-four groups. Additional studies need to look at the effectiveness of grouping while addressing the different instructional levels of various participants.

This study looked at group size by holding the curriculum and instructional level constant. The results indicate a need for a deeper look into differentiated grouping and instruction as a way to deliver content effectively. Future studies could also investigate the possibilities of higher-level peers being mixed heterogeneously to create larger gains at any instructional level for a variety of skills.

Finally, further research focusing on effective time factors of phonemic awareness instruction at various initial risk levels needs to be explored. This study utilized a six-week timeframe that included approximately eight hours of supplemental instruction. The students also experienced phonemic awareness instruction within their own classrooms, however, the amount of instruction varied by teacher. The National Reading Panel (2000) suggested that five to 18 hours of effective phonemic awareness instruction is needed to positively impact student learning.

Educational Implications and Recommendations

This study examined the effect of initial risk level on phonemic awareness achievement. The results indicate that although the achievement gap was not closed in the 6-week treatment period, impressive gains were made by students who began the study as at risk. These findings support the use of supplemental intervention for at risk students.

This study also examined the effects of initial risk level and group size on phonemic awareness achievement. The results of this study suggest that small instructional groups can be effective for a number of at risk students. Out of the 19 at risk students who participated in the one-to-four groups, five remained in the at risk category at the end of the study, while twelve improved to either the some risk or low risk categories. This finding indicates that though all the at risk students were not affected by the treatment, for the majority, small group intervention was sufficient enough to improve their phonemic awareness skill level.

The National Reading Panel (2000) found that transfer to reading was greatest for studies that lasted between five and 18 hours. This study included approximately eight hours of instruction in phonemic awareness activities. Clearly more time was needed to close the gap between the at risk students and the low risk students. Effective beginning reading programs need to include enough practice for at risk students to be able to achieve at the benchmark level.

This study also indicated that one level of instruction for all participants was not effective in positively affecting phonemic awareness achievement for all students. The intervention instruction for this study had a positive effect on the at risk students, but very little effect on the some risk or low risk students. The results suggest that intervention that is explicit, systematic, and intensive at this level is appropriate for those who lack a firm basis in phonemic awareness (Chard & Dickson, 1999; Davidson & Jenkins, 1994; Hurford, 1990; Liberman & Shankweiler, 1985).

Students enter kindergarten at many different levels. Some enter with a background rich in literacy while others find themselves entering kindergarten with limited opportunities. The findings of this study are consistent with the National Reading Panel's (2000) suggestion that phonemic awareness training should be tailored to the students needs. Teachers need to assess their student's abilities and make decisions about effective instruction based on individual student needs.

The at risk students in this study made impressive gains because the level of instruction may have been closer to their instructional level then it was for the some risk and low risk students. The same effect was also seen within the grouping variable. Group size was not an important factor for the at risk students who improved regardless of the number of students in their instructional group. Though the group size varied, the at risk students were learning new phonemic awareness skills that they were not able to perform on the pretest. The some risk and low risk students in the one-to-four groups might have been experiencing a review of known concepts, while their peers in the one-to-one groups were experiencing instruction that might have been unintentionally adjusted to their instructional needs by inexperienced pre-service teachers.

A possible implication for the findings of this study is that at risk intervention can be delivered in small groups effectively. Though not statistically better, the majority of the at risk students were able to improve by participating in small group intervention. Although all the at risk students did not improve equally, the majority concluded the study above their initial level of risk. This finding suggests that not all at risk students need one-to-one intervention to acquire phonemic awareness skills. Most students could acquire basic phonemic awareness skills with explicit and systematic instruction

delivered in a small group setting. This study also suggests that though the majority of at risk students made gains in the small group setting, individual intervention for those who do not succeed in small groups is still very important. Further research needs to investigate the effectiveness of tailored small group instruction on the student achievement for at risk students.

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APPENDIX

Letters of Consent

INFORMED CONSENT
The Effect of Group Size on Phonemic Awareness Training

You are invited to participate in a research study to examine how group size affects a child's learning. This study is being conducted by Nikki Baugh, doctoral student at Auburn University, under the supervision of Dr. Susan Villaume, CNR advisor. I hope to learn how grouping affects the children's ability to learn about sounds in words.

We will hold an informational meeting at Double Churches Elementary School on Friday, August 20, 2004 at 6:00 in the Media Center. At this time Mrs. Baugh will cover all aspects of the study and any questions will be answered. During the next week, if you decide to permit your child to participate, a Columbus State University education student will invite your child into the common area near the classroom for a brief assessment lasting 5-15 minutes during the school day. They will be giving your child a simple assessment of early reading ability which includes identifying sounds in spoken words.

All of the children who have signed consent forms will participate in pre-testing during the first week of the study and post testing during the last week of the study. The children will work on activities related to phonemic awareness (the ability to hear sounds in spoken words) in different grouping sizes. The children will be assigned to either a tutoring (1:1) situation, a small group (1:4) situation or a whole class (teacher led) situation for the study. All three groupings have been shown to be beneficial to increasing a child's ability to hear and identify sounds in words and the assessments will provide valuable information for parents and teachers. However, we cannot promise that your child will receive any of the benefits described.

The information that is collected from our assessments will be kept confidential through a coding process. Information collected through your child's participation may be published in a professional journal and/or presented at a professional meeting. If so, none of your child's identifiable information will be included. We believe that your child will enjoy the activities offered.

If at any time, you or your child no longer wishes to participate, you may stop activities and withdraw any data that have been collected regarding your child. Your decision whether or not to allow your child to participate will not affect your future relations with Auburn University, the Department of Curriculum and Teaching, or Double Churches Elementary School.

To allow your child to participate, please fill out the consent form, sign it, and return it to your child's teacher. At the end of the study, you will receive a letter explaining your child's assessment scores.

Parent/Guardian Initial _____

If you have any questions, please call or e-mail Nikki Baugh, doctoral student (706-322-1125, baughnk@auburn.edu) or Dr. Susan Villaume, advisor (334-844-6882, villase@auburn.edu). For more information regarding your child's rights as a research participant, you may contact the Office of Research Programs by phone or e-mail. The people to contact are Mr. Chip Burson at bursoen@auburn.edu or 344-844-5966 or Dr. Peter Grandjean (the chair of the Auburn University Institutional Review Board) at grandpw@auburn.edu or 334-844-1462.

Please indicate whether your child will participate in the study by filling in the signatures below.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WISH YOUR CHILD TO PARTICIPATE IN THIS RESEARCH STUDY. YOUR SIGNATURE INDICATES YOUR PERMISSION TO ALLOW YOUR CHILD TO PARTICIPATE.

_____		_____	
Child's Name	Date of birth	Investigator's signature	Date
_____		_____	
Parent's or Guardian Name		Parent's or Guardian's signature	Date

ASSENT FORM

If it is all right with you, we are going to ask you some questions about some pictures, sounds, and words. We may ask you to work with a special teacher to learn more about what we hear in words. If at any time you don't want to go on, we will stop. Is that okay with you? If it is okay, we want you to write your name on this paper.

Name _____