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# Phonemic Awareness and Preschool: Does One-On-One Instruction Improve Reading Readiness?

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**PHONEMIC AWARENESS AND PRESCHOOL:  
DOES ONE-ON-ONE INSTRUCTION IMPROVE READING READINESS?**

**An Ed.S. Field Project**

**Presented to the**

**Department of Psychology**

**and the**

**Faculty of the Graduate College**

**University of Nebraska**

**In Partial Fulfillment**

**of the Requirements for the Degree**

**Specialist in Education (Ed.S.)**

**University of Nebraska at Omaha**

**by**

**Jolene J. Johnson**

**May 2003**

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THESIS (OR THESIS-EQUIVALENT PROJECT)  
(OR EDS FIELD PROJECT) ACCEPTANCE

Acceptance for the faculty of the Graduate College,  
University of Nebraska, in partial fulfillment of the  
Requirements for the degree of Specialist in Education,  
University of Nebraska at Omaha.

Committee

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PHONEMIC AWARENESS AND PRESCHOOL:  
DOES ONE-ON-ONE INSTRUCTION IMPROVE READING READINESS?

Jolene J. Johnson, Ed. S.

University of Nebraska, 2004

Advisor: Lisa Kelly-Vance, Ph.D.

Phonemic awareness and its connection to the early reading abilities of children was the focus of the following study. Of particular interest was the relationship between early reading interventions and the subsequent reading performance of preschool children. The study examined the effectiveness of a one-on-one phonemic awareness program with preschool children. The program consisted of individual phonemic awareness instruction sessions for fifteen minutes, three times per week, for six weeks. The children were individually monitored over the course of the six-week intervention using the Dynamic Indicators of Basic Literacy Skills (DIBELS) scale. The children were assessed weekly using probes from the Initial Sound Fluency subtest to obtain a correct initial sounds per minute score. Results of the phonemic awareness program suggest that one-on-one instruction is an effective way to improve pre-reading skills in preschool children. Implications of the current study are discussed.

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## Phonemic Awareness and Preschool:

### Does One to One Instruction Improve Reading Readiness?

Many children entering kindergarten are doing so without having the necessary preacademic skills they need to succeed. Those skills seem to be particularly lacking in the area of reading readiness and early reading ability. For many students the problem could be a deficit in phonemic awareness, a skill that shows both predictive and causal relationships with reading ability and success (Chard & Dickson, 1999; Smith, 1998). Unfortunately, the children who are the most likely to have problems with phonemic awareness are already at-risk due to their families' low economic and social status (Kaminski & Good III, 1998). Unless these children are repeatedly exposed to tasks that develop phonemic awareness, they will likely have extreme difficulty learning more complex skills such as reading and spelling. If these deficits continue as a child progresses through school, he/she will potentially fall further and further behind (Edelen-Smith, 1997; Lyon, 1998). Fortunately, many of these problems could be prevented with early reading programs that focus on developing phonemic awareness. Wasik and Bond (2001) state, "Having an effective language and literacy intervention that could be used in a whole-group classroom setting would have a significant impact on at-risk children's literacy development" (p. 244).

In this study, phonemic awareness skills and their relation to preschool reading readiness is examined. First, a definition of phonemic awareness is

discussed as well as what components it contains. Second, the relationship between reading and phonemic awareness is examined and specific research considered. Third, specific research involving phonemic awareness programs and preschool children is analyzed. At the end of those three sections, the potential benefits of including direct phonemic awareness instruction in a preschool classroom should become clear. Through the study, the effectiveness of phonemic awareness instruction, and also the benefits of the instruction being one-on-one are shown.

### *Phonemic Awareness*

Phonemic awareness is the “ability to understand that the spoken word is composed of a series of individual sounds” (Ball, 1993, p.1). Phonemic awareness is not sounding out words or phonics but rather it is how spoken language can be broken down into different parts of speech, such as words, syllables, onset-rime, and phonemes. Having phonemic awareness means that an individual understands the various levels of how speech can be broken down, and how the parts can be put together. Both an understanding of language sound structure and the ability to use, blend and segment sound smaller than words are involved in phonemic awareness (Kaminski & Good, 1998).

The phonemic awareness discussed in this study is explicit phonemic awareness. Phonemic awareness can also be implicit. Infants have an implicit understanding of the sounds of words and language (Walley, 1990). Explicit

understanding of phonemes can be more difficult for some children to attain, as spoken words are often perceived as one whole sound and not a combination of individual sounds. As we develop, the process for perceiving phonemes becomes much more automatic, but some children may still have problems stating explicitly how words are made up of sounds. It is this difficulty that can lead to the child having further problems learning to read.

One of the most common misconceptions about phonemic awareness is the idea it is synonymous with phonics. However, while both types of instruction involve sound manipulation, several differences between the two exist. Phonemic awareness is the ability to hear different sounds, reproduce them vocally and manipulate the sounds in a variety of ways. Phonics is hearing a sound and knowing it matches with a specific letter or combination of letters as well as knowing that each letter has a specific sound associated with it (Chard & Dickson, 1999). Phonics is also used in written language, while phonemic awareness is the correspondence between component sounds and spoken language (Kaminski & Good III, 1998). Phonics involves sounding out words and this process would be extremely difficult for a child who lacked phonemic awareness. Children who have a poor foundation in basic phonemic awareness skills will likely have difficulty learning phonics. Just as they do not understand the relationship between sounds, it is unlikely they will understand the relationship between letters and sounds Ball (1993).



Therefore, phonics builds upon the foundation of each individual's phonemic awareness abilities.

Phonemic awareness is cumulative in nature and is seen as an important precursor to both reading readiness and reading ability. The development of phonemic awareness is made up of abilities that become more complex in nature and build upon the skills from the preceding abilities. Children show signs of development when they "can demonstrate an appreciation of rhyme and alliteration" (Chard & Dickson, 1999, p.263). As the tasks involving phonemic awareness abilities become more complex, many children often have difficulty learning the later tasks and developing the more complex abilities.

The abilities included in phonemic awareness are initial rhyming, sentence segmentation, segmenting words into syllables, blending syllables into words, segmenting words into onsets and rimes, and finally, blending onsets and rimes into words. As phonemic awareness is cumulative in nature, skills should be taught in a developmental progression. As early as age 4, phonemic awareness instruction can begin to take place, mainly using rhyming activities. In kindergarten, the skills to learn are blending and segmenting into onset and rime, and during 1<sup>st</sup> grade the student should be able to learn how to blend, segment and delete phonemes (Chard & Dickson, 1999). For a 1<sup>st</sup> grader the most important skills are phoneme blending and phoneme segmentation (Ball, 1993).

The first step in the continuum of tasks is rhyming and recognizing rhymes. The child should be able to rhyme words and sounds as well as be able to recognize when words rhyme. The second level of phonemic awareness involves the ability to blend phonemes and to split apart syllables. Finally, the third level involves the child segmenting phonemes in spoken words and also deleting sounds to form other and different words. The levels of phonemic awareness are split up even further into very specific tasks.

One of the most predictive tasks for future reading ability is sound segmentation. Sound segmentation is “the ability to segment words into individual sounds” (Ball, 1993, p. 4). For a child to be proficient at segmentation, he/she must understand that words can be broken down into individual sounds, and these sounds can be represented by letters. Most children find it easier to segment compound words, such as doghouse, and words into syllables, such as flower, than to segment words into sounds (Ball, 1993; Edelen-Smith, 1997). One important procedural aspect to note is that these tasks are completed through auditory instruction only; letter pictures or cues are not used.

Along with sound segmentation comes the ability of sound blending. Sound blending is “the ability to listen to individual sounds and blend them together to make a word” (Ball, 1993, p.3). Sound blending involves blending words to form compound words, blending syllables into words and finally blending individual sounds into words. This hierarchy of blending tasks

usually makes it much easier for the child to blend sounds automatically when they begin reading. Children start out learning less difficult blending tasks before applying what they have learned to the more complex blending tasks.

### *Importance of Phonemic Awareness to Reading*

According to Adams (1990) the three most crucial literacy skills are phonological (phonemic) awareness, language skills and an awareness of print. Other studies suggest that a lack of phonemic awareness may be the one of the main causes for early reading problems in students, and that a causal and predictive relationship exists between reading ability and phonemic awareness (Ball, 1993; Chard & Dickson, 1999; Edelen-Smith, 1997). In fact, phonemic awareness may be a better predictor of reading success than IQ. Smith (1998) reports that phonemic awareness ability in kindergarten is predictive of a student's reading level one to eleven years later. Spector (1992) found that how a child performed on a dynamic measure of phonemic awareness at the beginning of kindergarten was predictive of reading scores at the end of the year.

Specific skills from the phonemic awareness hierarchy appear to have more of an effect on future reading ability than other skills in the hierarchy. While the less complex skills such as rhyming and onset-rime lead to the more complex skills, they do not necessarily impact reading (Chard & Dickson, 1999). The skills that appear to have the most impact are the segmenting and

blending skills, and as stated before segmentation is the strongest predictor of later reading and spelling skills (Ball, 1993).

Prevention may be the best action to take in reducing the number of children who develop reading problems. Research suggests that gains made from phonemic awareness instruction may be maintained for 2-4 years following the instruction (Smith, 1998). It is important to remember also that a child does not need to be learning disabled to have specific problems learning phonemic awareness skills. For some children, the problems may be a lack of experiences and opportunities to be exposed to phonemic awareness principles. Lyon (1998) states, "We now understand that specific systems in the brain recover sounds from spoken words, and just as in learning any skill, children understand phoneme awareness with different aptitudes and experiences" (p. 3). Many children improve their phonemic awareness abilities through instruction and this increase in phonemic awareness ability may also improve the early reading abilities of the same children (Chard & Dickson, 1999; Smith, 1998). Instruction in phonemic awareness may be particularly crucial for children who are already at-risk for developing reading disorders by acting as a mediator (Bowey, 1995).

Byrne and Fielding-Barnsley (1995) used a phonemic awareness program entitled Sound Foundations (Byrne & Fielding-Barnsley, 1991) with preschoolers. Each child in the experimental group was given instruction in a small group setting (4-6 other students) one hour per week for twelve weeks.

At the end of the initial study, the students in the experimental groups showed greater improvement in their phonemic awareness skills and these skills generalized to sounds beyond those specifically taught during the program. Children who had received the phonemic awareness training in preschool continued to show superior ability 2-3 years later in decoding and in reading comprehension. While the researchers do not support the idea that age of the experimental group contributed to the positive effects, they do believe that the exposure to early phonemic awareness instruction played a large role. Byrne and Fielding-Barnsley (1995) state, "However, because it is known that combining instruction in phoneme identity with instruction in elements of the orthographic code is superior to phonemic awareness training alone, we suspect that it is the focus on phoneme identity rather than the fact that it came before formal reading instruction that is important" (p. 497).

Castle, Riach and Nicholson (1994) examined the effects of a phonemic awareness program on 5-year-old students' spelling and reading performance. This program took place in an already existing whole language program, and the results indicated significant effects for both spelling and reading. For the first experiment, the experimental group received phonemic instruction twice per week for ten weeks. While both the experimental and control groups improved greatly during the duration of the program, the experimental group's gains were significantly greater in both overall phonemic awareness and spelling ability.

For the second experiment, the groups were compared on measures of reading ability and phonemic awareness. The experimental group received a phonemic awareness program 20 minutes per week over fifteen weeks. Both groups improved greatly from pretest to posttest with the experimental group scoring significantly higher on tests of phonemic awareness. However, while the experimental group scored higher on the tests of reading ability the difference between the groups was not significant. Phonemic awareness did have a significant impact on phonemic awareness ability in both experiments, even though their peers were also receiving instruction in language, reading and writing. The results suggest that phonemic awareness instruction has incremental value when adding it to an already existing program for young students.

Phonemic awareness programs for students do not need to be complicated or set up and initiated by a team of researchers. A kindergarten teacher, aware that several students begin her class without reading readiness skills, implemented a phonemic awareness program a part of her curriculum. She had daily activities to enrich her students' phonemic awareness skills, and she took data to monitor their progress. She found that not only did their basic skills improve overall, they also became more enthusiastic about books and reading in general (Reiner, 1998).

*Research in Reading Interventions and Preschool*

Studies have shown that children of low SES status are at a higher risk for developing problems or having problems learning to read (Bowey, 1995). Phonemic awareness has been a part of several of these studies with mixed results. While phonemic awareness instruction has been found to be effective in large groups, Torgesen, et al. (1994, as cited in Kaminski & Good III, 1998) found that 30% of an at-risk sample did not respond to the intervention. This finding suggests that a phonemic awareness program may need to be adjusted to meet the needs of at-risk children (Chard & Dickson, 1999).

In recent studies, graduates of Head Start, a preschool program for at-risk children, have been found to have particularly low language and reading abilities, scoring in the 20<sup>th</sup> percentile for prereading concepts and in the 10<sup>th</sup> percentile for vocabulary (Whitehurst, Epstein, Angell, Crone, & Fischel, 1994). Based on these and other data suggesting a need for early reading interventions, Whitehurst et al. (1994) conducted a study adding on a literacy program to the already existing Head Start curriculum. The literacy program consisted of dialogic reading (interactive reading between an adult and child) and phonemic awareness instruction, which was based on an effective program used in Australia, called Sound Foundations. The dialogic reading was continued over 30 weeks, while the sound foundation program was only 16 weeks in duration. Several centers were sampled and the 167 participants were randomly assigned to either the intervention or the control condition. A pretest

assessment was completed by the child, and a demographic questionnaire was completed by the parent(s). The intervention took place over the course of a school year, and at the end of the intervention, each child completed a posttest assessment.

The results indicate that overall the intervention was effective in increasing some readiness skills in Head Start children with significant gains being made in print concepts and writing skills. While linguistic ability as a whole did not significantly improve, a subtest of linguistic ability, Identify Sounds and Letters was significant. This result is important because it is the test that corresponds the most to the sound foundation instruction. However, the other significant results cannot be conclusively attributed to either the dialogic reading or the sound foundation instruction. One interesting finding is that children who received more individual reading time with a parent at home experienced a significant increase in language skills when compared to children with less one-to-one reading exposure. While the results are promising, “it is important to note that this add-on curriculum fell short of bringing children in Head Start up to the typical level of performance of children of their age” (Whitehurst et al., 1994, p. 554).

A replication and follow-up study by Whitehurst et al. (1999) examined the effects of the same emergent literacy intervention (dialogic reading and sound foundation instruction) on a new cohort of Head Start students. The students were assessed starting in Head Start and continuing through second



grade. For the students in the intervention condition, posttest results at the end of Head Start showed favorable results and some of the gains were still significant at the kindergarten follow-up. However, Print Concepts while significant at the posttest was not when examined again during kindergarten. The significant results of the emergent literacy program were maintained in kindergarten but were not found in the reading scores in either first or second grade. While significance on the specific tests was not maintained, students who had received the intervention continued to increase their skills through second grade, starting at the 12<sup>th</sup> percentile upon entering Head Start and ending second grade at the 40<sup>th</sup> percentile. Therefore, the increase in skills was almost a full standard deviation and left the students only about 1/3 of a standard deviation behind their peers (Whitehurst et al., 1999). The study indicates that long-term effects can be gained through some small additions to an existing Head Start curriculum, and it shows that early intervention has the potential to prevent later reading problems.

A similar study was conducted in Australia, which examined the effectiveness of the Schoolwide Early Language and Literacy (SWELL) program (Center & Freeman, 1997). The program beginning in kindergarten and continuing through first grade is based on the assumption that some children enter school without the necessary skills for reading readiness. Therefore, the program begins with beginning skills and builds from there. Central to the program is the phonemic awareness hierarchy and is broken up

into two stages. Stage 1 is labeled emergent literacy and teaches the following skills: (a) story-telling and retelling, (b) concepts about print, (c) connections between speech and written activities, (d) early phonological awareness concepts, mainly rhyme and alliteration, (e) expressive and receptive language, and (f) emergent writing (Center & Freeman, 1997). Stage 2 is becoming literate and, among other things, contains the phonemic awareness tasks of blending, segmenting and manipulation of sounds.

The posttest results on a phonemic awareness scale indicated an overall significant effect between the experimental and control groups following kindergarten. While not significant, the students from the experimental group did show greater improvements than the control group at the end of first grade. The authors concluded that while not significant, enough of a trend was seen to warrant an increase in early reading intervention that include phonemic awareness, especially for at-risk students (Center & Freeman, 1997).

Based on the research linking phonemic awareness to early reading success and research showing the slight effectiveness of reading intervention programs with at-risk children, it seemed plausible to take the research one step further. In the present study, an intervention that provided phonemic awareness instruction on a one-on-one basis was provided to several students in a preschool classroom. The intervention program combined some of the suggestions given by other researchers (Whitehurst, et al., 1994), specifically to test the effectiveness of phonemic awareness instruction with at-risk

children in an intense situation, which would be the one-on-one instruction.

The intervention was also shorter, (six weeks in length), than ones previously used to determine if a shorter intervention affects phonemic awareness.

### *Research Question*

Based on previous suggestions, the following research question was addressed: Does Phonemic Awareness instruction, provided one-on-one, improve reading readiness scores of at-risk pre-school children?

Research has shown that early reading interventions have been effective in improving readiness scores of at-risk preschool children (Center & Freeman, 1997; Wasik & Bond, 2001; Whitehurst et al., 1994; Whitehurst et al., 1999). The research, however, has focused on small and large group instruction. Yet, components of several of the studies show benefits of having more individual attention, such as individual reading time with a parent at home (Whitehurst et al., 1994). No research could be found on one-on-one interventions in the school and/or preschool settings. Previous individual research focused on the parents as interventionists and not educators. The phonemic awareness literature has focused on programs that are several weeks in length, the shortest one being 12 weeks of intervention. Shorter program time has not been examined in any context, group or individual program. My research attempted to demonstrate the effectiveness of a reading intervention using phonemic awareness instruction only, as well as the effectiveness of one-on-one instruction. It also examined whether six weeks of intervention could

produce changes in the students pre-reading abilities. The importance of determining the effectiveness of one-on-one instruction is sometimes only one child in a class has low skills and requires intervention. My hypothesis was that after receiving one-on-one instruction in phonemic awareness, the children would have higher phonemic awareness skills measured by their posttest assessment compared to the children who did not receive the intervention.

## Methods

### *Participants*

The participants were all from one preschool center from a mid-size city in the Midwest. The children were between the ages of 4-5. Six children received individual instruction in phonemic awareness along with their regular curriculum. Five children acted as the control and received only the regular curriculum. Four children in each group were four years old, one child in the control group was 5 and two children in the intervention group were 5 years old. The mean age for the intervention students was 4.83 years and the mean age for the control students was 4.76 years. Each group contained four girls. The control group had one boy and the intervention group had two boys. All of the children selected were primary English speakers. The children were not assigned to either group based on pre-test rankings but rather were placed randomly into groups.

*Measures*

The children were monitored using the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) (Good & Kaminski, 2001) before beginning the intervention and during each of the six weeks of phonemic awareness instruction. The DIBELS is appropriate to use with this age population and at least one of its subtests, the phoneme segmentation fluency subtest, has been found to be a good predictor of later reading ability. The DIBELS was also chosen because after a review of other tests, none were found to be suitable for this age group.

The DIBELS scale has been used to determine which children need interventions, which interventions are effective, and when interventions have successfully reduced the risk (Kaminski & Good III, 1998). The DIBELS is a good measure to monitor progress in children who are preschool through kindergarten age. While much variability can be expected with such a young age group, using the DIBELS is considered to be a low-stakes testing decision because the skills being assessed are not considered necessary, only transitory. The cost of a decision error is minimal because even if a child received or did not receive an intervention little to no harm would be done.

Three specific subtests of the DIBELS show good reliability, validity and utility in predicting later reading ability. They are the phonemic segmentation test, onset recognition fluency and letter-naming fluency. The phonemic segmentation test is a particularly good indicator of phonemic

awareness in children from late preschool to the middle of kindergarten. This test assesses the number of correct phonemes per minute and is used for both screening and monitoring as it separates the high from low performers. For the purposes of this study, the students were monitored using the Initial Sounds Fluency test. The test has over 20 forms and takes about three minutes to administer. The ISF test has a reliability of .91 and predictive validity of .45. This subtest was chosen because of the DIBELS subtests it is the only one suitable for a preschool age group.

The ISF test required the child to first identify pictures by their initial sounds and then to produce the initial sound for one of the four pictures of the probe. First, the researcher identified each picture of the probe by pointing to it and saying the object name. Then the child was asked “What picture begins with /n/?” The child pointed to a picture and the next question was asked. The last question of each probe asked the child to orally provide the initial sound. For example, the child was asked, “What sound does “wrist” begin with?” Each week four different probes were used to monitor the progress of each child. The child was timed on their responses. The time started after the question was asked and ended when the child answered by either pointing to a picture or giving the initial sound. To score the probe, the researcher multiplied the number of correct answers by 60 and then divided by the total number of seconds it took the child to answer the questions. This equation gave the number of correct initial sounds per minute.

Before the phonemic awareness pre-test was given, a measure of the preschool curriculum was given to the teacher. This provided data as to what early reading skills were covered in the students' daily routine, and which ones were missing or touched upon infrequently. A checklist was given to the preschool teacher (see Appendix). Questions regarding content taught, average number of children in her group, number of phonemic awareness skills addressed, and tasks children spend the majority of their time on were asked.

### *Procedures*

Before beginning the phonemic awareness program, a baseline level was established for all students using the DIBELS benchmark probes from the Initial Fluency Test. The same four baseline probes were given to each child before beginning the intervention. Following the baseline phase, each of the children in the one-on-one group received six weeks of phonemic awareness instruction. The instruction took place three times a week (Mondays, Wednesdays and Fridays) for fifteen minutes each session, and all the sessions were one-on-one. If a child is absent, the session was made up either that week or in the next. During the middle of the intervention, the students had Thanksgiving break and no lessons were taught that week. All instruction occurred while the child was at the preschool center, and no home component was used. All lessons were given in the second preschool room so that there was not any interference from the other students. . All lessons took place in the second preschool room where each student worked one-on-one with an

instructor. The room was large enough so there was minimal interference from other students in the room. Two to three students were in the room at one time receiving individual lessons. The regular curriculum activity missed by the students was unstructured center time. During this time, the students are assigned centers, but then are allowed free play with no instructions or structured activities.

The instruction was provided by either the primary investigator or another trained school psychology graduate or undergraduate student. All assistants met with the investigator before the project began to go over the curriculum and lesson plans. On the day of the lesson, the assistants reviewed the individual lesson with the primary investigator. Lessons and instructions were taken from the commercially available curriculum, *Teaching Phonemic Awareness to Young Children* by Adams, Foorman, Lundberg, and Beeler (1998). The lessons were based upon the hierarchy of phonemic awareness tasks, and followed the developmental sequence of those tasks. Each child received the same lessons and instruction during his/her one-on-one session. The lessons were not individualized based on the child's pre-test assessment because it was important to have variability in beginning levels. In this way, growth could be attributed to the specific curriculum and hierarchy of lessons. If one were to do individualized instruction in a classroom, the pre-test assessment would help indicate what skills the child already has. Therefore, the instruction could be based on that student's strengths and weaknesses.



One skill was focused on each week, so by the end of six weeks, six skills that are part of the phonemic awareness hierarchy were learned. During the first week, listening games were played with the children to introduce them to the concepts of listening, especially to sounds. The students listened to nature sounds to identify specific sounds such as birds, waterfalls, and wind. They played a game in which they had to find a hidden ticking timer. Finally, they had to listen to and follow instructions, which became more complex as the task progressed. The following week focused on rhyming using games and worksheets. During this week, the students listened to rhyming stories and songs, rhymed words together and filled in sentences with words that rhymed. For example, the child was asked to provide a word for a sentence such as: A cat wearing a \_\_\_\_\_. (hat). The third week was spent breaking down sentences into words and compound words into smaller words. The children learned the components of a sentence, how sentences are made up of words and finally, how to break up sentences into their words using blocks as a visual cue. The fourth week was spent on the awareness of syllables within the words. During this week, the students clapped out the syllables in names, of objects drawn from a bag (sunglasses, stamp, pokemon) and then put syllables together to form words. The fifth week the students learned to differentiate initial and final sounds of words. The students listened to initial sounds of classmate names and had to guess whose name started with that sound. The technique was then applied to looking for specific picture cards. Then the

children were asked to give the initial sounds of the picture cards drawn from a pile. During the sixth week, the focus was on particular phonemes and learning how the phonemes make words. The students were given two phoneme words and asked to break the word down into its sounds. Since progress monitoring was used and data were collected each week, no formal post-test was given. All students completed the six week intervention, no students dropped out or failed to complete the lessons. The teacher was given a copy of the lesson plans and curriculum used in case she wanted to incorporate anything into her curriculum after the intervention was over.

#### *Data Analysis*

The data was interpreted using a single subject design for all the participants (see Figures 1-11). Individual graphs were used to monitor each student's progress on the DIBELS ISF probes. Each week the number of correct initial sounds per minute was graphed for each student regardless of whether they received were receiving phonemic awareness instruction. A visual analysis of the graphs gave a qualitative idea of the progress for each student. The use of single subject design has been and is used quite frequently in school psychology and applied behavioral research (Kazdin, 2001).

From the graph data, effect sizes were calculated for each participant by subtracting the baseline mean from the intervention mean and then dividing by the standard deviation of the baseline phase. Along with effect size, a statistic called percent of non-overlapping data was calculated (see Table 1).

Percent of non-overlapping data can be obtained through a few simple steps. First, the highest baseline point is determined. A parallel line is drawn from that point across the intervention phase. Any data points at or below this line are considered to be overlapping. A percentage of 85% and above will indicate that the phonemic awareness instruction was highly effective, 65%-85% indicates moderate effectiveness and anything below 65% indicates that the intervention effect should be questioned (Bonner & Barnett, 2002). Using effect size and PND is new in single subject design research. As a result, there is little other research using these methods, but given the intervention nature of the study the use of these statistics was appropriate.

Descriptive results were obtained for all individuals with specific questions being addressed. Gain scores were calculated for each student (see Table 1). The amount of gain over six weeks was determined by subtracting the mean of the baseline from the mean score at the end of the intervention. From the various analyses the following questions were answered. Did all the children benefit? What are the effect sizes and PNDs for each child? Did the amount of improvement vary from child to child?

### Results

The research question was: Does phonemic awareness instruction, provided one-on-one, improve reading readiness scores of at-risk preschool children? From the data gathered, the answer appears to be yes. Overall, the

students in the intervention group outperformed the students in the control and made more improvement over the course of the six weeks.

### *Baseline and Gain Scores*

The mean baseline score for the intervention group was 5.62 correct initial sounds per minute, the mean score at six weeks was 24.95 correct initial sounds per minute and the mean points gain was 19.33 correct initial sounds per minute. On average, the students who received the intervention gained almost 15 points more than the students in the control group. The mean baseline score for the students in the control group was 8.29 correct initial sounds per minute, the mean score at the end of six weeks was 12.85 correct initial sounds per minute with the mean score gain equaling 4.56 points over the course of six weeks.

One student in the intervention group did not gain more points than the control group mean,  $3.96 < 4.56$ . This particular student scored well on his ISF baseline probes, but never really came back to that level. Given that for each question, the child has a 25% chance of getting the answer correct for each probe question, he may have guessed well during baseline. It is also possible he was more familiar with those sounds, but the concepts failed to generalize to other sounds and tasks. However, he could be the student who needs the intervention the most and would benefit from an extended intervention.

### *Percent of Nonoverlapping Data*

Of the students participating in the one-on-one phonemic awareness instruction, 5 of 6 students had a higher percentage of non-overlapping data than the average in the control group. The PND scores for the five students were 100%, 92%, 88%, 83% and 63%. One student had a PND=46% and thus fell below the control group average. The control group consisted of five students, four girls and one boy. The PND for the group was 55.2%. The PND scores for the 5 control group students were 38%, 67%, 55%, 75% and 42%. Of the members in the control group, only one student's PND score was above the questionable level of effectiveness. This would be expected as the control group students while receiving the preschool curriculum received no individual phonemic awareness instruction.

### *Effect sizes*

Effect sizes could be calculated for 4 of the 6 students and were higher than the control group effect size of .17. The effect sizes for the students of the intervention group ranged from 2.92 to 10.37. The PND and effect for the control group were calculated by averaging the PNDs and effect sizes obtained from the individual graphs of each of the control group students. All data points were used to calculate each individual's PND and effect size. Effect sizes could not be calculated for two members in the control group because there was no variability in their baseline scores. Effect sizes for the control

group ranged from  $-.51$  to  $.90$ . The results indicate that overall members in the control group did not improve much over the course of six weeks.

### *Curriculum Measure*

The curriculum measure filled out by the teacher indicated what skills were taught in the classroom and the frequency that they were taught. Listening skills and skills leading to the identification of initial and final sounds of words were taught more than once per day. The teacher considered the ability to know that sentences are made up of words to be extremely important and included those lessons in her curriculum about once a day. Rhyming was in the curriculum about once per week and was considered moderately important. Of less importance (rated neutral) were awareness of syllables and phonemes both of which were included in the preschool curriculum less than once per week.

### Discussion

The results of the study filled in some of the gaps from previous phonemic awareness research. The focus of the current study was on individual instruction in phonemic awareness over a short period of time. Previous studies have focused more on long-term, group instruction strategies. Many of these studies combined phonemic awareness instruction with some other reading instruction component such as at-home reading. Past studies have

shown the effectiveness of phonemic awareness instruction over different duration 12 weeks to one year, but none of the other studies have been as short as six weeks (Center & Freeman, 1997; Whitehurst et al., 1994). The current study indicates that not only is phonemic awareness effective in one-on-one instruction, but it is effective in as little as six weeks. The results should encourage the exploration of shorter interventions, particularly if only a small number of students need the instruction. While other studies have focused almost exclusively on group instruction, the current study indicates the effectiveness of one-on-one instruction. As both intervention sizes (group and individual) have been shown to be effective, teachers should explore more options in relation to phonemic awareness programs. With one-on-one instruction, they can build on a student's specific strengths while targeting weaknesses. With group instruction, they can foster early reading skills for a larger group.

Both the PND and effect sizes of the intervention students suggest moderate to large gains for all but one of the students. Compared to the scores of the control group, the students in the intervention group performed better at the end of the six weeks. Particularly striking about the two groups was the amount of gain made over the six weeks. The children in the control group while making some improvement mostly maintained their scores and in some cases performed worse. In the intervention group, the gains made by the students were impressive as all but one made gains of at least five more points

than the control group average. The results indicate that phonemic awareness instruction in a one-on-one manner is an effective intervention.

One implication of the study is the effectiveness of one-on-one instruction. Whitehurst et al. (1994) used an individual instruction component in their research, but the instruction was at home with the parents and was not phonemic awareness instruction. While that study found the overall intervention to be effective, neither the phonemic awareness instruction nor the individualized dialogic reading component was isolated. The current study found individualized instruction in phonemic awareness given by graduate students to be effective. The one-on-one instruction was simple to complete and very time efficient at 45 minutes per week. The results of the intervention students indicate that large gains in phonemic awareness can be made in a short period of time. In fact, after about 10 minutes of instruction, most of the students struggled to pay attention regardless of whether or not they understood the task. Yet, large gains were made and the students came to understand the tasks. The information is useful to teachers because oftentimes only a couple of students are struggling not the entire class, and this allows them to provide a short term, time efficient intervention to help them catch up to the other students.

Since gains were made by children as young as age four, the study supports previous findings that phonemic awareness instruction is appropriate for children who are preschool age (Chard & Dickson, 1999). The results show



that instruction can be provided at an earlier age than was traditionally thought meaning more children could be entering kindergarten with better reading readiness skills. The curriculum used would be easy enough for a teacher to implement. After all, the preschool teacher involved in the current study already included some of the skills, such as listening and the identification of initial sounds, in her regular curriculum. Therefore, she would merely need to incorporate the other skills and chart the progress of her students. When students needed extra assistance, he/she would have the confidence of knowing that short-term individual instruction is effective in building up skill deficits.

Given the results of the study, I would expect children in the intervention group to be more ready than their peers to learn phonics and beginning reading skills in kindergarten. Their preschool teacher mentioned that the students receiving the intervention scored better than her previous year's class and student not receiving the intervention on a pre-reading test. She mentioned they scored higher particularly in the area of rhyming. Therefore, upon entering kindergarten, they should have at least some of the awareness needed for early reading skills, especially phonics. According to Ball (1993) children who have strong phonemic awareness skills have an easier time understanding phonics than children with poor phonemic awareness skills. As the majority of students made significant gains in their phonemic awareness skills, I would predict that phonics would be learned more quickly

While the intervention was effective as a whole, not everyone showed improvement. Several possible reasons exist for the lack of progress made by the one student in the intervention group. Starting out, the student did not have the lowest baseline nor was he discrepant from his peers. However, over the time period, he performed inconsistently from week to week (see Figure 6). Duration of the intervention may not have been sufficient for this child to gain the skills needed or time in instruction may have been inadequate. Or he simply may not have responded to the phonemic awareness instruction. Lack of response is similar to the 30% of the sample who did not respond to the phonemic awareness instruction in the Torgesen, et al study (1994). Perhaps the tasks became too complex too quickly and this child needed more practice to master the skills effectively. The results of this student indicate the need for continued progress monitoring when implementing an intervention. If this had been an individual intervention, the data would have shown that a change needed to be made to help increase the child's skill level.

The study supports the use for phonemic awareness instruction with preschool students, but some limitations exist within the study. The biggest limitation of the study was the measure used to monitor progress. While it was the only measure appropriate for this age group, the DIBELS subtest used tests a very specific part of phonemic awareness, initial sound fluency. For the test, the child had a one in four chance of answering each question correctly, and therefore, guessing was not penalized, but instead often rewarded. The best

indicator of growth was whether the student could independently produce the initial sound of each specific picture item. Had the students been in kindergarten or even late preschool, other measures could have been added to provide more validity to the results. However, the teacher did report that the students in the intervention group were performing better than their classmates and previous years' classes on a pre-reading test. She reported higher scores particularly in the rhyming sections of the test.

Another limitation of the study is the small size of both groups and the number of effect sizes that could be calculated. While larger numbers would have been preferable, all but one student in the preschool class participated in the study. In the schools, single subject research is much more common and the methods used in this study are more realistic in that setting. For example, an educator could use the same methods and materials for a struggling student without having to interpret standard scores and complicated statistics. The intervention could be implemented as is and would allow an educator to instruct a student in phonemic awareness and monitor progress. Castle, Riach and Nicholson (1994) found success in adding on a phonemic awareness program to an existing curriculum with five-year-old students. Therefore, adding on to an existing curriculum should have similar effects.

For future research, a follow-up study would be recommended as the results do not indicate long-term gains and whether or not the scores can predict reading scores in kindergarten and first grade. Given previous work in

the area (Byrne & Fielding-Barnsley, 1995), I would expect some long-term effects of the intervention. If a follow-up study was attempted, more measures could be used to monitor progress as the students get older. Other DIBELS tests could be added to measure subsequent skills. Another measure of pre-reading skills is recommended, even if it is only a pre-test, post-test measure. Having more measures lends more support to the conclusions reached in this study. Finally, a study could focus on the effectiveness of phonemic awareness instruction based on each student's initial skill level.

Overall, the hypothesis was supported as the majority of students in the intervention group performed better than the control group. Yes, the students varied in the amount of their gains, but the gains made were higher than those in the control group.

The study supports the use of one-on-one instruction to boost phonemic awareness skills in preschool age children. Given the basic nature of the curriculum, it is something that could be implemented into classrooms, used by teachers and even provided to parents to use at home.

## References

- Adams, J. M. (1990). *Beginning to read: Thinking and learning about print*. Cambridge, MA: The MIT Press.
- Ball, E. (1993). Assessing phoneme awareness. *Language, Speech, and Hearing Services in the Schools, 24*, 131.
- Bonner, M. & Barnett, D.W. (2002). Preparing for intervention-based services: Innovations for child-level and program-level accountability. Unpublished dissertation. University of Nebraska-Omaha.
- Bowey, J. A. (1995). Socioeconomic status differences in preschool phonological sensitivity and first-grade reading achievement. *Journal of Educational Psychology, 87*, 476-487.
- Byrne, B. & Fielding-Barnsley, R. F. (1991). Evaluation of a program to teach phonemic awareness to young children. *Journal of Educational Psychology, 83*, 451-455.
- Byrne, B. & Fielding-Barnsley, R.F. (1995). Evaluation of a program to teach phonemic awareness to young children: A 2-and 3-year follow-up and a new preschool trial. *Journal of Educational Psychology, 87*, 488-503.
- Castle, J. M., Riach, J., & Nicholson, T. (1994). Getting off to a better start in reading and spelling: The effects of phonemic awareness instruction within a whole language program. *Educational Psychology, 86*, 350-359.

- Chard, D. J. & Dickson, S. V. (1999). Phonological awareness: Instructional and assessment guidelines. *Intervention in School and Clinic, 34*, 261.
- Center, Y. & Freeman, L. (1997). A trial evaluation of SWELL (Schoolwide Early Language and Literacy): a whole class early literacy program for at-risk and disadvantaged children. *International Journal of Disability, Development, and Education, 44*, 21-39.
- Edelen-Smith, P. J. (1997). How now brown cow: Phoneme awareness activities for collaborative classrooms. *Intervention in School and Clinic, 33*, 103-112.
- Good, R. H., & Kaminski, R. A. (Eds.). (2001). *Dynamic Indicators of Basic Early Literacy Skills* (5<sup>th</sup> ed.). Eugene, OR: Institute for the Development of Educational Achievement.
- Haskins, R. (1989). Beyond metaphor: The efficacy of early childhood education. *American Psychologist, 44*, 274-282.
- Kaminski, R. A. & Good III, R. H. (1998). Assessing early literacy skills in a problem-solving model: Dynamic indicators of basic literacy skills. In M. R. Shinn (Ed.), *Advanced Applications of Curriculum-Based Measurement* (pp.113-142). New York, NY: The Guilford Press.
- Kazdin, A. (2001). *Behavior Modification in Applied Settings* (6<sup>th</sup> ed.) Belmont, CA: Wadsworth/Thomson Learning.

- Lee, V. E., Brooks-Gunn, J., Schnur, E. (1988). Does Head Start work? A 1-year follow-up comparison of disadvantaged children attending Head Start, no preschool and other preschool programs. *Developmental Psychology, 24*, 210-222.
- Lyon, G. R. (1998). Why learning to read is not a natural process. *Educational Leadership, 55*, 14-19.
- Reiner, K. (1998). Developing a kindergarten phonemic awareness program: An action research project. *Reading Teacher, 52*, 70-73.
- Smith, C. R. (1998). From gibberish to phonemic awareness: Effective decoding instruction. *The Counsel for Exceptional Children, July/Aug., 20/25*.
- Spector, J. E. (1992). Predicting progress in beginning reading: Dynamic assessment of phonemic awareness. *Journal of Educational Psychology, 84*, 353-363.
- Wasik, B. A. & Bond, M. A. (2001). Beyond the pages of a book: Interactive book reading and language development in preschool classrooms. *Journal of Educational Psychology, 93*, 243-250.
- Walley, A. C. (1990). The development of spoken word recognition and segmentation ability. Unpublished book chapter. University of Alabama at Birmingham.

- Whitehurst, G. J., Epstein, J. N., Angell, A. L., Payne, A. C., Crone, D. A., & Fischel, J.E. (1994). Outcomes of an emergent literacy intervention in Head Start. *Journal of Educational Psychology, 86*, 542-555.
- Whitehurst, G. J., Zevenbergen, A. A., Crone, D. A., Schultz, M. D., Velting, O. N., & Fischel, J. E. (1999). Outcomes of an Emergent Literacy Intervention from Head Start through second grade. *Journal of Educational Psychology, 91*, 261-272.



## Appendix

## Phonemic Awareness Curriculum Measure

Please fill this questionnaire out to the best of your ability. Circle the best choice.

## 1. A. How important are Listening Skills?

Extremely important      Moderately important      Neutral      Not that important

## B. How often do you incorporate the acquisition of listening skills in your classroom?

More than once a day      once a day      twice a week      once a week      less than once a week

## 2. A. How important is Rhyming?

Extremely important      Moderately important      Neutral      Not that important

## B. How often do you incorporate rhyming into your classroom?

More than once a day      once a day      twice a week      once a week      less than once a week

## 3. A. How important is the understanding that sentences are made of words?

Extremely important      Moderately important      Neutral      Not that important

## B. How often do you incorporate learning that sentences are made of words?

More than once a day      once a day      twice a week      once a week      less than once a week

## 4. A. How important is the awareness of syllables?

Extremely important      Moderately important      Neutral      Not that important

## B. How often do you incorporate the awareness of syllables in your classroom?

More than once a day      once a day      twice a week      once a week      less than once a week

## 5. A. How important is being able to identify initial and final sounds?

Extremely important      Moderately important      Neutral      Not that important

## B. How often do you incorporate identifying initial and final sounds in your classroom?

More than once a day      once a day      twice a week      once a week      less than once a week

## 6. A. How important is the understanding of phonemes?

Extremely important      Moderately important      Neutral      Not that important

## B. How often do you incorporate the understanding of phonemes?

More than once a day      once a day      twice a week      once a week      less than once a week

Table 1

*Gain Scores, PNDs and Effect Sizes Resulting from Phonemic Awareness**Instruction*

<b>Student</b>	<b>Gain Score</b>	<b>PND</b>	<b>Effect Size</b>
#1	32.47	92%	4.42
#2	23.11	100%	10.37
#3	9.71	88%	2.92
#4	33.33	83%	*
#5	13.4	63%	*
#6	3.96	46%	4.72
<b>Control</b>			
#7	5.63	38%	*
#8	10.96	67%	*
#9	-6.15	55%	-.51
#10	8.87	75%	.90
#11	3.49	42%	.11

Note. \* no effect size could be calculated

### Figure Caption

*Figure 1.* Progress monitoring using correct initials sounds per minute for student #1.

*Figure 2.* Progress monitoring using correct initials sounds per minute for student #2.

*Figure 3.* Progress monitoring using correct initials sounds per minute for student #3.

*Figure 4.* Progress monitoring using correct initials sounds per minute for student #4.

*Figure 5.* Progress monitoring using correct initials sounds per minute for student #5.

*Figure 6.* Progress monitoring using correct initials sounds per minute for student #6.

*Figure 7.* Progress monitoring using correct initials sounds per minute for student #7.

*Figure 8.* Progress monitoring using correct initials sounds per minute for student #8.

*Figure 9.* Progress monitoring using correct initials sounds per minute for student #9.

*Figure 10.* Progress monitoring using correct initials sounds per minute for student #10.

*Figure 11. Progress monitoring using correct initials sounds per minute for student #11.*

























