

# Hands-on and Kinesthetic Activities for Teaching Phonological Awareness

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Object box and environmental print card activities and kinesthetic/oral activities used in two before school programs for Title 1 students are presented for teaching phonological awareness concepts to students in primary grades. A small program evaluation study in which the two experimental groups made similar improvements and larger gains than a control group indicates that the materials are effective for teaching phonological awareness to students at risk of failure in reading.

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**KEY WORDS:** early childhood; primary grades; phonological awareness; object box; kinesthetic research; before-school program; environmental print.

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## INTRODUCTION

A focus on balanced reading instruction that includes phonological awareness, phonics, fluency, and comprehension has evolved out of recent discussions and research reviews focused on research-based best practices in early literacy instruction (International Reading Association, 2003; NICHD News Release, April 13, 2000). An important component of a balanced approach to reading instruction is phonological awareness (Adams, 1990; Ball, 1997; Chall, 1967/1983; Liberman, Shankweiler, & Liberman, 1989; Siegel, 1993; Stanovich, 1988; Torgesen, Wagner, & Rashotte, 1994; Wagner & Torgesen, 1987). Another component is phonics instruction. While phonological awareness is the knowledge that

language is composed of sounds and that sounds can be manipulated (Brownell & Walther-Thomas, 1999), phonics refers to the process of linking these sounds to their letter symbols (NICHD, 2000). Good phonics instruction should develop phonological awareness and vice versa (Stahl, Duffy-Hester, & Stahl, 1998).

Phonological awareness and phonics instruction may take different forms from verbal and visual methods that emphasize workbooks and computer games to multi-sensory approaches that emphasize hands-on activities and manipulatives. It is important that teachers have a variety of approaches supported by research to teach these important skills. Each child has unique learning needs and one approach in a classroom will probably not address all student needs. Thus, we explored the efficacy of manipulatives in teaching phonological awareness. In this article, we describe two experimental before-school programs, one focusing on kinesthetic activities that require large body movements and the other focusing on tactile activities that involve students in manipulating objects. Participants were first through third grade students at risk of failure in reading. The two experimental programs were compared to a control condition consisting of students in a pullout program in the same elementary school. A "pullout" program is one in which another instructor temporarily

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“pulls” or removes students from their regular classrooms to engage in lessons focused on areas of student need. All participants were pretested and posttested with a standardized test of phonological skills.

### THE BEFORE-SCHOOL PROGRAMS

The two before school programs stemmed from a collaboration between university personnel (the authors) and the principal of a local elementary school where preservice teachers tutored students during field placements. The principal was pleased with the engaging literacy activities preservice teachers had used and wondered if a trial before-school program might be initiated based on these materials. To compare the efficacy of a kinesthetic approach emphasizing verbal and large movement activities and a tactile approach that focused on object boxes (Rule, 2001a, b), two different before-school programs were created, taught by the same certified teacher. Object boxes, discussed more thoroughly below, are shoebox size containers holding objects that are manipulated by the children

to reinforce phonological and phonetic concepts. The teacher met with Group 1 (verbal and large movement) for four weeks (Group 2 did not receive treatment at this time), and then she switched programs to conduct four weeks of before-school sessions for Group 2 (a more tactile approach with object boxes), while Group 1 did not receive treatment. This arrangement was repeated one more time, so that each group attended a total of eight weeks of intervention. The students met three mornings a week (Tuesday–Thursday) for 45 minutes a day, receiving a total of 18 hours of phonological awareness instruction. Details of the two programs are presented below with outlines presented in Table I.

#### Verbal/Kinesthetic Group

The first before school program emphasized verbal/kinesthetic activities conducted in whole or small groups, although students also participated in card games with verbal responses and writing. Many activities were used or adapted from Glaser (1999), and the authors devised others. Activities included

Table I. Before-School Program Schedule

Phase	Time	Activity	Examples
<i>Verbal/kinesthetic activity group</i>			
Introduction	8:00–8:10	Song, discussion, or book to focus on skill	Teacher plays guitar or cassette player to teach participants phonological awareness songs
Centers	8:10–8:40	Word game	Bingo game of words containing the called sound Concentration game of rhyming words Stepping Stone Activity*
		Kinesthetic or oral game	Pantomime of -er words such as “painter.” Break words into syllables orally with tapping.
Snack & wrap-up	8:40–8:45	Writing station Weekly homework assignment	Write rhyming stories similar to <i>A Wocket in my Pocket</i> by Dr. Seuss Find two pictures that represent rhyming words, e.g., a picture of a plate and a picture of a gate.
<i>Tactile/object box group</i>			
Introduction	8:00–8:10	Review of concept and use of boxes	Whole group instruction for concept of the day, e.g., rhyming word families, or vowel digraphs.
Centers	8:10–8:40	Phonological awareness box	Sorting environmental print words according to number of phonemes Sorting words represented by objects according to the number of syllables*
		Phonics box	Matching words that differ in long or short vowel sound to objects they represent. Vowel change word family*
		Writing station (thursdays)	Write the words objects represent using the movable alphabet Write 4-letter long vowel silent e words*
		Environmental print box Individual instruction	Sorting words with vowel digraphs according to long vowel sound* Tutor helping with individual skills
Snack & wrap-up	8:40–8:45	Weekly homework assignment	Look for pictures in a magazine with a particular phonological theme, e.g., pictures representing two-syllable words or long o sound.

\*Indicates a set of materials for an activity illustrated in a figure.

songs, phonics card games, word games, and writing. Students rotated through four stations with a writing station added one day a week.

The Group 1 activities included bingo and concentration games of different phonological concepts along with reading of sight words and phonics games. Some sample kinesthetic activities were pantomime of “er” words, (e.g., painter, baker, driver, walker, jogger, and runner) to emphasize the meaning of this suffix as “one who \_\_\_s,” and changing extended arm positions to indicate whether called words had long or short vowel sounds, to practice discriminating vowel sounds. Another example was a stepping stone game where the student identified r-controlled sounds in words called by the teacher and stepped on the paper stone representing the same r-controlled sound (e.g., “ar” sound found in car, barn, garden). In this game students recognized the typical spellings of these vowel-plus-r combinations, allowing them to more easily decode and spell these words. Figure 1 shows one set of paper stepping stones for this game.

### Tactile/Object Box Group

The second group’s program focused on hands-on activities in which small objects were manipulated. Students worked individually and in small groups with boxes of materials. These boxes were of two basic types: (1) environmental print sets of words cut from food and other product boxes mounted on colored cardboard, and (2) object boxes containing objects (toys, miniature facsimiles, small household items) along with printed word cards or headings for sorting. Students rotated through four stations with a writing station added one day a week.

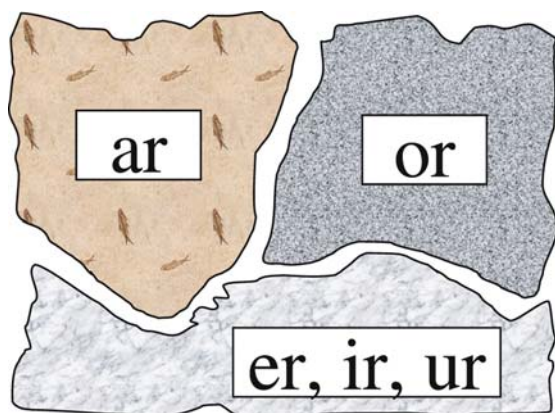


Fig. 1. Stepping Stones Games.

There were 40 boxes of activities available: 6 phonemic awareness boxes, 17 phonics object boxes, 4 vowel change boxes, 6 vocabulary development boxes, and 11 environmental print boxes organized in categories: phonological awareness, phonics, and reading practice. The sources for these activities were *Environmental Print Activities for Language and Thinking Skills* (Rule, 2001a) and *Hands-on Materials for Teaching Phonological Awareness and Phonics* (Rule, 2001b). Some representative activities are shown in Figures 2–5 and described below.

Phonemic awareness involves auditory discrimination of language into discrete parts: words, syllables, and individual sounds (phonemes). Dividing words into syllables, word parts that have only one vowel sound, is a common activity when helping children develop phonemic awareness. To practice segmenting words into syllables, students sorted a set of objects into groups with heading cards. A part of the set is shown in Figure 2. The student chooses an object; says the word it represents, such as “centipede”; breaks the word into syllables, “cen/ti/pede”; and counts the number of syllables (in this case, three syllables). The student uses heading cards to indicate the number of syllables, guiding placement of objects.



Fig. 2. Syllabication Object Box.

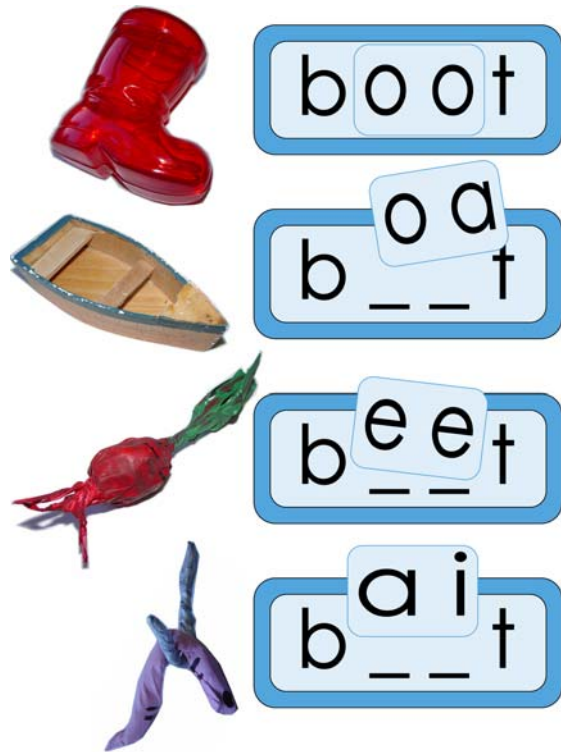


Fig. 3. Vowel-change Word Family.

Students working with vowel-change word families, like the one shown in Figure 3, observe how different vowel sounds produce different words. They



Fig. 4. Four-letter Long Vowel Silent-e Words.



Fig. 5. Sorting Words by Vowel Sound.

gain valuable practice in identifying letter combinations that represent different vowel sounds during this exercise. The student first makes a column of the word cards with missing vowels: “b \_ \_ t.” Next, the student places a small vowel card in the blank vowel space to make a word. The student then produces the sounds represented by the consonants and vowel digraph to say the word. Finally, the student places the corresponding object next to the word.

Students used a movable alphabet to spell four-letter long vowel silent-e words for objects, as shown in Figure 4. This activity increased awareness of how an “e” at the end of a word changes the sound represented by the preceding vowel. For example, as the word “tape” is being formed with movable alphabet letters (before the final e is added), the word would be pronounced as “tap” with a short a vowel sound. However, the addition of “e” changes the vowel sound represented by “a” from a short to a long sound. The act of forming each word letter-by-letter helps students to focus on the sound-spelling relationship. Organizing the objects and cards into a neatly aligned layout allows students to practice organizational skills that support chart reading and making.

The environmental print word cards in Figure 5 were cut from the cardboard packaging of food and

other products and mounted on colored mat board. Students recognized many of the brightly colored words and enjoyed speculating on the original products. The variation in fonts allowed students to practice letter discrimination, preparing them for reading in a variety of contexts. Real-world connections to products they see every day made the activity more meaningful.

The environmental print activity shown in Figure 5 allowed students to practice identifying different letter combinations that represent the same vowel sounds. Many words encountered in reading are confusing to students because they represent unexpected vowel sounds such as the long “a” sound in “they” or “eight” and the long “i” sound of “buy.” This activity allowed students to notice these vowel digraphs (two vowels representing one long vowel sound) that occur in many words, to recognize patterns as they sorted more words with the same vowel combinations into each group (these extra words are not shown in Figure 5), and to begin to feel comfortable reading these words.

## EVALUATION DESIGN

Both of the experimental before-school programs and the control pullout program took place at the same elementary school in southwest Idaho. Thirty-four students in grades first through third who qualified for Title I services were sorted into ten ability-matched sets of three students each based on previous performance on the Idaho Reading Indicator (a state test of phonological awareness and reading performance) and the reading subtest of the Iowa Tests of Basic Skills (a standardized test that measures skills of students from kindergarten to grade 8). The Idaho Reading Indicator is an individually administered screening test given to students in grades K-3 three times each year. Its purpose is to monitor early literacy development and provide teachers with initial reading performance data on each student that then should be

augmented with additional assessments. One student from each of these matched sets was randomly assigned to each condition, with the four remaining unmatched students being put into the control condition because it could accommodate more students. Table II shows information about group composition.

Students in the control group did not attend the before-school program, but rather received extra literacy services through the regular Title I pullout program in operation at the school (Title I is a federally funded program to improve the quality of education in high-poverty schools and/or to give extra help to struggling students). In this program, children were removed from their non-literacy classes and went to a resource room for extra tutoring in pairs or individually for thirteen to 15 minutes each day. During this time, students practiced a variety of reading and phonological awareness skills, such as sounding out words in context (using the alphabetic principle or other decoding strategies), searching for words in the text with a particular phonics pattern, learning and applying phonics rules, and completing phonological awareness worksheets. The Title I teacher also listened to students read aloud and assisted them in decoding words. For the most part, students in the control condition addressed phonological awareness skills in the context of reading from the basal text and through written worksheet activities, rather than through kinesthetic/oral games or hands-on object box/environmental print activities.

The control group provided the opportunity to compare the traditional Title I pullout reading intervention program already in use at the school to before school programs that focused on different modalities of learning. The two experimental groups participated only in the before-school program and received no other Title I reading/language services. The control group and the experimental groups received the same number of hours of additional literacy instruction during the duration of the study, because students were removed from non-literacy

**Table II.** Group Compositions

Group	Gender		Grade Level			Title I	Qualify for Special Ed.
	Male	Female	Grade 1	Grade 2	Grade 3		
1. Verbal/kinesthetic experimental	6	4	2	6	2	10	0
2. Object box experimental	5	5	1	6	3	10	3
3. Traditional pull-out control	9	5	4	6	4	14	1

classes for their Title 1 pullout program. Students in all three conditions received 18 hours of extra literacy instruction over the course of the four-month study.

### Assessment of Phonological Awareness

The *Phonological Awareness Test* (PAT) (Robertson & Salter, 1997) was used as the pretest and posttest in this study. It is a norm-referenced test that was developed to assist teachers and clinicians in diagnosing students' deficits in phonological awareness and to provide information about a student's knowledge in sound/symbol correspondence and basic decoding skills. It is an individually administered test that includes rhyming, segmentation, isolation, deletion, substitution, blending, graphemes, and decoding subtests. All students were individually administered the PAT as a pretest two weeks before the intervention began and as a posttest at the end of the study. Test norms have been established for students 5 years, 0 months through 9 years, 11 months. The raw scores include subscores in each of the areas noted above and total raw scores can be used to determine age equivalents, percentile ranks, and standard scores for each student. The reliability and validity of this test have been established.

### RESULTS

Table III presents a summary of the pretest, posttest and gain score results for all three groups. The verbal/kinesthetic activity group and the object box/environmental print group scored very similarly on the pretests and posttests. Although students in these two experimental groups initially scored lower on the PAT than students in the control group, by the end of the intervention, on the posttest, their scores nearly matched those of their control group peers. This is an indication of the potential efficacy of the two experimental group programs for lower achieving students.

**Table III.** Pretest, Posttest, and Gain Score Averages for All Groups

Group	Standard Scores		
	Pretest	Posttest	Gain
1. Kinesthetic activity	86.4 (8.5)	105.3 (8.4)	18.9 (6.0)
2. Object box	88.2 (8.6)	106.2 (6.3)	18.0 (10.1)
3. Control	100.1 (6.9)	108.4 (8.2)	8.2 (6.5)

Note. Standard deviations in ( ).

An additional, although anecdotal, finding deserves further investigation. Although the PAT is not a timed test, the post-test administration time of the PAT was shortened by about 10 minutes for the students in the experimental groups. The ability to recognize words is characterized by accuracy, automaticity, and speed (Ehri & Wilce, 1979). This suggests that students in the experimental groups had internalized the skills leading toward automaticity of decoding skills.

### DISCUSSION AND RECOMMENDATIONS

Teachers of both special and general education students need to be able to employ a variety of strategies and approaches to teach phonological awareness and phonics. Based on the results of this study, the kinesthetic/tactile methods used may supplement and reinforce phonological awareness material covered in regular and special education classrooms. Future research is needed to further explore the efficacy of these materials with larger samples, better control of extraneous variables, and a diversity of assessments.

This experiment was conducted with only 34 students at 1 school. This limits the external validity of the experiment, making it necessary to use caution in making generalizations to other populations. Additionally, after all students were pretested with the PAT and after the experimental programs were underway, it was discovered that the control group had a higher average phonological awareness score than the two experimental groups (See Table III). The researchers decided to continue the study to see how the gains of the poorer-achieving students in the experimental groups would compare to those of the control group. Finally, although total instructional time spent in the remediation settings was held constant across the three groups, the two experimental conditions had their school day extended because their programs were delivered in a before-school format. Thus, total instructional time for them was longer. In future studies, the instructional time variable needs to be better controlled.

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