

Evaluating the Suitability of Phonological Awareness Programs for Children Who Are at Risk

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The kindergarten teachers, first-grade teachers, and special educators of Prairie School sat at the lunch table excitedly discussing the previous day's inservice program on phonological awareness. Phonological awareness is one prereading skill that intrigued the teachers because approximately 35% of the first-grade students at Prairie School were poor readers or nonreaders at the end of first grade and the referral rate to special education for reading was increasing year after year. In addition, most of the poor readers followed the patterns noted by Juel (1988) and Johnston and Allington (1991) and remained poor readers through the upper grades even with remedial services.

Now the teachers were brainstorming possibilities. Should the teachers add phonological awareness activities to their curriculum? What should the instruction look like? What should they do about students who responded poorly to their phonological awareness activities? (See box, "Phonological Awareness Skills.")



This article shows how an understanding of phonological awareness can help teachers improve the reading skills of their students—particularly those at risk of failure.

Is Phonological Awareness Important?

The Prairie School teachers were not alone. Many kindergarten teachers and special educators face similar issues as

Phonological Awareness Skills

Phonological awareness involves orally manipulating the individual sounds in words. Instruction is oral (without print) but should be integrated with instruction in the alphabetic principle (letter/sound correspondence).

The following are activities for students:

- Rhyming
- Comparing words or sounds (e.g., Does mat start with same sound as man? yes)
- Isolating beginning, middle, or ending sounds (e.g., What is the first sound in mat?/m/)
- Blending (e.g., What word do the sounds /m/, /a/, /t/ make? mat)
- Segmenting (e.g., What are the sounds in mat?/m/, /a/, /t/)
- Deleting (e.g., What word is mat after /m/ is taken away? at)
- Substituting sounds (e.g., What word is mat if you change the /t/ to /d/? mad)

states and districts increasingly mandate that all students read fluently and independently by the end of the third grade (Bush, 2000). In addition, the popular and research literature (e.g., National Reading Panel, 2000) supports instruction in phonological awareness as one avenue to improved reading for all students. In fact, some writers have indicated that phonological awareness abilities account for significant differences between good and poor readers (e.g., Coyne, Kameenui, & Simmons, 2001; Lyon, 1998). Further, students entering school without the ability to analyze the sound structure of words are at risk for having difficulties with reading (Lyon, 1998b).

On a positive note, many studies have indicated that children who begin school with low phonological awareness and subsequently receive instruction in phonological awareness consistently improve in their phonological abilities and achieve greater reading success than students who receive no training (e.g., Blachman, 2000).

Phonological Awareness Instruction

The Prairie School teachers wanted to know how to select an instructional program that would address the needs of students who are at risk for reading disabilities and other reading problems. How should they select one from the increasing variety of published programs? Further, many basal reading programs contain phonological awareness activities. The teachers at Prairie School wanted guidelines regarding program effectiveness before selecting a program. They were particularly concerned about students, such as those with learning disabilities, who do not respond to initial teacher instruction or who struggle to acquire reading skills.

The teachers knew that not all children respond equally to instruction. Acquisition of phonological skills, as with reading acquisition, occurs on a continuum from students who learn easily to students who require intensive instruction. Understanding these variations of intensity and how to apply them to evaluating and modifying existing phonological awareness instructional programs may help the teachers better instruct the students who lag in acquiring reading skills.

Students with reading disabilities and other reading problems can improve in phonological awareness when they receive the appropriate instruction (Lyon, 1998a; O'Connor, Notari-Syverson, & Vadasy, 1998a). Some curricula, however, may lack the explicit, systematic instruction in phonological awareness that students with reading disabilities may require (Wanzek, Dickson, Bursuck, & White, 2000). Information regarding systematic instruction in phonological awareness can help special and general educators evaluate and adapt phonological awareness curricula.

To identify common threads of systematic, effective instruction, Coyne et al. (2001) used a framework of curriculum-design principles. These authors identified six design principles in an effort to translate research from phonological awareness into practice. We use the design principle of mediated scaffolding as a key guideline for the sup-

port at-risk readers will need when learning phonological awareness skills.

Unfortunately, not all published phonological awareness programs include sufficient scaffolding (Wanzek et al., 2000). The following section examines the necessary components for a well-scaffolded program and possible adaptations that would be needed for at-risk learners and learners with disabilities if a program were weak in this area.

Scaffolding Instruction

Mediated scaffolding is the support provided during initial instruction. For at-risk learners, programs should provide a great deal of support or scaffolding during the first phases of instruction in phonological awareness and reading. The program should then allow teachers to gradually reduce support as the learner becomes more fluent in a skill. The intent of scaffolding is to lead learners to an independent skill level with the least amount of confusion and error along the way.

Mediated scaffolding takes many forms, including scaffolding provided by the content, by the individual task, by the materials, and by the teacher (Smith, Simmons, & Kameenui, 1998). We discuss each type of scaffolding separately. The acquisition of phonological awareness skills, coupled with explicit instruction in word analysis, can have a positive effect on subsequent reading achievement (Lyon, 1998).

Content Scaffolding

The careful sequencing of phonological awareness skills from easier to more difficult provides content scaffolding (see box, "Phonological Awareness Skills"). Here is the order we recommend:

- To scaffold beginning reading instruction, you should first teach skills such as rhyming, isolation of beginning sounds, and comparison tasks as preskills because these skills are easier, more facilitative skills (Adams, 1990).

Mediated scaffolding is the support provided to students during initial instruction.

Six Design Principles

Principle	Definition
Big Ideas	High priority concepts that facilitate acquisition of phonological awareness and reading
Mediated Scaffolding	Temporary, external support provided to guide students to mastery of phonological awareness.
Strategic Integration	Integrating skills that will assist students in applying their phonological knowledge to reading.
Conspicuous Strategies	Strategies taught by overtly teaching how to do all the steps required to complete a phonological skill.
Primed Background Knowledge	Connecting previously acquired knowledge to new phonological skills.
Judicious Review	Systemic recurrence and practice of phonological skills to reinforce learning.

- Of the multiple phonological awareness skills, blending and segmenting sounds in words appear the most closely related to later reading achievement (Torgesen, Morgan, & Davis, 1992).
- The more difficult skills of deletion and substitution should follow blending and segmenting because these skills require more operations (Yopp, 1988).

Using this information, you should look for a training program that not only emphasizes the skills of blending and segmenting, but also includes introductory skills (e.g., rhyming). If your program includes deletion or substitution, you should plan to teach these skills after blending and segmenting.

If your current program does not follow these sequencing guidelines, you can easily adapt it for learners with disabilities by simply re-ordering the skills in a more appropriate order. If your program includes no introductory skills, you can add them before you cover blending and segmenting.

Task Scaffolding

To provide task scaffolding, programs should carefully arrange individual task examples according to their level of complexity. As students are taught phonolog-

ical awareness, they are required to perform a variety of tasks orally.

You can scaffold phonological awareness tasks by changing the following:

- The size of the unit being manipulated (e.g., saying the syllables in a word before saying the sounds in a word; saying the onset and rime in a word before saying the individual sounds).
- The number of phonemes or sounds in a word (e.g., two-phoneme words before three-phoneme words).
- The phoneme position in the word (e.g., beginning sound, ending sounds, or middle sounds).
- The phonological properties of the word (e.g., continuous sounds such as /m/ before stop sounds such as /t/).
- The type of student response that is required (e.g., responding by identifying or pointing before responding by producing sounds).

Word Parts. The size of the unit being manipulated refers to how large or how small a “chunk” the student is orally manipulating. For example, saying the syllables in a word is a larger chunk than saying its individual sounds (phonemes). Generally, larger chunks are easier to manipulate than smaller ones (Treiman & Zukowski, 1996).

Content scaffolding refers to the careful sequencing of skills, such as rhyming, blending, and substituting sounds.

In a beginning lesson, you may teach the students about syllables by using student names (e.g., *Robert*) and asking the students to say the names in rhythm while clapping (/Rob/ /ert/). Children’s ability to orally manipulate individual phonemes, however, is most important and most related to reading acquisition (Lyon, 1995). Therefore, the program you are using should emphasize manipulation at the phoneme level (e.g., breaking *mat* into /m/ /a/ /t/) midway through kindergarten and use larger chunks such as syllables and onset-rime (e.g., breaking *mat* into /m/-/at/) as preskills leading up to the manipulation of phonemes (O’Connor, 2000).

If the program being evaluated does not devote the majority of its examples to phoneme manipulation or if manipulation of larger chunks is not used first, you will need to adapt the program to accommodate the at-risk learner. It is possible to create an emphasis on phoneme manipulation by adding additional examples to the activities. If the program does not provide activities that allow manipulation of larger chunks first, you will need to create these activities.

For example, you can use multisyllabic words for practice in dividing words into syllables (e.g., *zebra* is /ze/ /bra/).

You can easily develop onset-rime practice for students having difficulty dividing words into individual

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phonemes by using the word lists already given and requiring students to orally split the words into onset-rime. For example, you could modify an activity that suggests the students use puppets to orally divide the word *mat* into its individual sounds of /m/ /a/ /t/— and change it to have the students use the puppets to say the onset and rime /m/- /at/ instead. Once a student has mastered manipulation of these larger units, you can repeat the activities with the original emphasis on individual sounds. Both of these adaptations will provide the necessary practice and scaffolding needed for the at-risk learner.

Numbers of Sounds. A second aspect of task scaffolding involves beginning instruction with words having a small number of subunits or phonemes and then progressing to words having a larger number of phonemes. Therefore, instruction should begin with two-syllable words before advancing to three-syllable words, and begin with two-phoneme words before advancing to three-phoneme words.

Programs may use two- to three-phoneme words exclusively; but if the program includes three- and four-phoneme words, you should not introduce them until students have mastered words with two and three phonemes. This guideline is important if you have developed additional word lists. The words should begin with smaller words (e.g., *it*) before advancing to larger words (e.g., *sit*). If you are merely adding more practice to an existing activity, the examples should contain the same subunits or phonemes as the examples given in the program.

Position and Properties. The phoneme position and the phonological properties of sounds are also important scaffolds. Typically, beginning sounds are easiest and are manipulated before ending sounds; middle sounds are the most difficult and are taught last (Ball & Blachman, 1991). For example, an activity asking students to say beginning sounds (e.g., “What sound do *bat* and *bit* begin with?”) should precede an activity asking students to say ending sounds (e.g., “What sound do you hear at the end of *bat*?”). In addition, words beginning with continuous sounds (e.g., /m/, /s/) are usually taught first because they can be stretched, making it easier for the learner to manipulate. The use of continuous sounds first, however, has yet to be verified conclusively. For this reason, words beginning with stop sounds (e.g., /b/, /t/) are sometimes taught along with continuous sounds. Clusters (e.g., /st/, /bl/) are taught last. They are thought to be the most difficult because two sounds are closely blended together. If a program does not follow these guidelines for phoneme position, you can alter a phoneme segmenting activity to focus on a beginning, ending, or middle sound.

Response. A final area of task scaffolding is the type of response the learner is expected to give when answering a question or completing a task. Basically, students can have two types of possible responses to phonological awareness questions and tasks, as follows:

- A student may be asked to *identify the answer* (e.g., “Point to the pictures that begin with /b/.” or “Listen to the following pairs of words and say ‘yes’ if they begin with the same sound.”).
- Or a student may be asked to *produce the answer, or the sound* (e.g., “What sound is the first sound in *if* ?” or “Tell me the sounds in *cat*”).

A consistent recommendation for producing sounds is found in the research (e.g., Ball & Blachman, 1991). Simple identification answers allow the student to practice hearing the individual sounds in words without having to separate and produce the sounds independently. Therefore, identification can

be used as an easier task leading to production of individual sounds.

Although most programs already stress sound production as a response, programs that fail to do so consistently can be adapted by requiring sound production in place of identification responses or by using sound production along with identification answers. For example, an activity that requires the learner to point to a picture that begins with the /b/ sound could be adapted to also have the learner say the name of the item in the picture and the beginning sound orally after pointing to that picture.

Materials Scaffolding

Most phonological awareness programs use concrete manipulatives to support student learning. You can make phonological awareness more concrete by having students move tiles, blocks, or other objects that represent individual sounds. For example, when segmenting the word *mat*, the student would say /m/ and move a tile, say /a/ and move a tile, and say /t/ and move a tile. Despite the frequent use of manipulatives in phonological awareness programs, limited research supports the effectiveness of these materials; and they can be difficult to phase out once students have learned the concept (Young, 1999).

We recommend that scaffolding instruction for children who are at risk for reading difficulties be based on the other principles presented in this article, not on the implementation of manipulatives. If manipulatives are an integral part of a well-designed program, you need to manage them appropriately and phase them out when students no longer need them. If an otherwise well-designed

Instruction should begin with two-syllable words before advancing to three-syllable words, and begin with two-phoneme words before advancing to three-phoneme words.

program does not include manipulatives, you can easily add them in the event that students still struggle to learn.

Teacher Scaffolding

The last level of scaffolding involves teacher instruction. Students who are at risk for reading disabilities often do not develop strategies for accomplishing tasks or learn strategies as easily as higher-performing students do and require explicit instruction (Lerner, 2000). Teacher modeling of strategies for detecting and producing phonemes is an important component to teacher scaffolding.

Example Lesson (Blending Skill)

Materials: The teacher will need to prepare a list of objects in the room that have three phonemes and begin with continuous or stop sounds.

1. The teacher tells the students "We're going to play our funny sounds game again. This time I'm going to say the name of something in the room. Remember I'm going to say it very slowly in a funny way. Then we will say the word it makes."
2. The teacher picks an item in the room (e.g., pen). "Listen to the sounds I say. /p/ /e/ /n/. Say those sounds with me. /p/ /e/ /n/. Say those sounds together (without the teacher). /p/ /e/ /n/. That word is pen. Say the word. pen. Listen: /p/ /e/ /n/ makes pen. Try it with me. First let's say the sounds /p/ /e/ /n/. Now, with me, what word does that make? Now you try it. Say the sounds. /p/ /e/ /n/. What word does that make?"
3. The teacher repeats this activity with other items in the room.
4. "Now let's see if you can figure out the word by yourselves. Here are the sounds /t/ /a/ /p/. Say those sounds. /t/ /a/ /p/. What word is it?"
5. The teacher repeats this activity with other items in the room.

Two Students With Phonological Awareness Difficulties

On a screening measure for phonemic awareness, kindergartners Rebecca and Jason demonstrated difficulty identifying the first sounds in words. When asked to say the first sound in a word, they frequently responded by restating the word given to them by the teacher.

Ms. Lowe, the kindergarten teacher, began instruction for Rebecca and Jason at the level of identifying the first sound in a word, an easier task than segmenting words into onset-rime or into individual sounds (phonemes). Following scaffolded instruction that included teacher modeling, teacher-led responses, and immediate correction, Jason responded quickly. He subsequently received instruction in segmenting words into onset-rime followed by instruction in segmenting and blending words at the phoneme level. Rebecca, however, did not respond to initial instruction.

For Rebecca, Ms. Lowe changed instruction to provide more scaffolding. She used a larger word unit and began instruction for Rebecca in dividing words into syllables. Because the program that Ms. Lowe had selected did not include lessons at the syllable level, Ms. Lowe developed word lists of multisyllabic words to provide the extensive practice that Rebecca required. Ms. Lowe began with two-syllable words, using the scaffolds of teacher modeling, tiles to represent each syllable, teacher-led responses, and immediate error correction. As Rebecca improved in accuracy, Ms. Lowe phased out (faded) the scaffolds, having Rebecca segment words into syllables without the use of models, tiles, or teacher-led responses.

When Rebecca mastered segmenting words into syllables, Ms. Lowe began instruction in identifying the first sound in one-syllable words. Rebecca required more modeling and teacher-led responses than Jason or other students had required. Ms. Lowe developed additional word lists to those presented in the phonemic awareness program to provide more practice for Rebecca. Ms. Lowe monitored Rebecca's progress, increasing or fading scaffolding as Rebecca demonstrated slow or quick progress.

As soon as Rebecca mastered identifying initial sounds, Ms. Lowe began instruction in segmenting words into onset-rime and subsequently into phonemes. By the end of kindergarten, Rebecca accurately, but slowly, segmented words with two phonemes. Ms. Lowe alerted the first-grade teacher that Rebecca would need additional instruction in segmenting words into phonemes and that Rebecca would respond to scaffolded instruction.

Ideally, you would use this kind of support more extensively when you are introducing a new skill or task, to assist the student in understanding the task with the fewest chances for error. You would phase out such scaffolding, of course, once students are capable of performing the skills more independently. The "model-lead-test" format provides the most support for at-risk learners during initial skill instruction with the fewest chances for error (see box, "Example Lesson"). For example, when teaching first-sound segmenting, you would use the model-lead-test format as follows. "Listen to the word *bear*. The first sound in *bear* is /b/. Say the first sound in *bear* with me. What's the first sound in *bear*?"

Wanzek et al. (2000) found that phonological awareness materials often use only parts of the model-lead-test format; sometimes they use other variations:

Resources: Examples of Phonological Awareness Programs Using Effective Scaffolding

Ladders to Literacy (O'Connor, Notari-Syverson, & Vadasy, 1998b)
Phonemic Awareness in Young Children (Adams, Foorman, Lundberg, & Beeler, 1998)
Phonological Awareness Training for Reading (Torgesen & Bryant, 1994)

Table 1. Effective Design Checklist for Phonological Awareness Program

Program Component	Strongly Present	Moderately Present	Absent	Notes
Content Scaffolding				
Most activities are devoted to blending and segmenting at the phoneme level.				
The easier skills are taught before blending and segmenting at the phoneme level.				
More difficult skills, such as deletion and substitution follow blending and segmenting.				
Task Scaffolding				
Manipulation of compound words, syllables, and onset-rime is used before manipulation of phonemes.				
Manipulation of individual phonemes is presented in multiple activities.				
Words with 2-3 phonemes are used before words with 4-5 phonemes.				
Words beginning with "stop" and "continuous" sounds are included.				
Words beginning with "clusters" are taught last.				
Sounds at the beginning, middle, and end of words are manipulated.				
Students are required to produce sounds in the majority of the activities.				
Materials Scaffolding				
Concrete manipulatives are available for use to represent the sounds students are manipulating.				
Strategies are provided for managing and fading manipulatives.				
Teacher Scaffolding				
Adequate teacher models are provided to facilitate student understanding.				
New skills or tasks are introduced using a model-lead-test format.				

- Modeling only ("Listen to the word *bear*. The first sound in *bear* is /b/.").
- Model-lead ("Listen to the word *bear*. The first sound in *bear* is /b/. Say the first sound in *bear* with me, /b/.").
- Model-test ("Listen to the word *bear*. The first sound in *bear* is /b/. What's the first sound in *bear*?").

You can easily adapt an activity that includes any type of modeling to a model-lead-test format by using the *model* example given and taking the students through the *lead* and *test* components.

If there is no modeling present in an activity, you will need to develop exam-

ples for modeling the skill. Develop these examples by converting some of the examples intended for student practice into a model-lead-test format. For example, you can take an example originally intended for the students ("What is the first sound in *bear*?") and model the answer, as described previously.

Most phonological awareness programs use concrete manipulatives to support student learning.

Make sure that all the tasks the student will be required to complete in a new activity are taught and modeled in this format first. For example, the first time students are expected to say all the sounds in a word, be sure to model how to say *all* the sounds in the word and not just the beginning sound. It is unnecessary to include modeling with an activity that is completely review.

Final Thoughts

Many schools face situations similar to those at Prairie School. Phonological awareness is an important skill leading to reading acquisition. Students who may be at risk for reading disabilities and other reading problems can benefit from effective instruction in phonological awareness (see box, “Two Students”). Although many programs are available for teaching phonological awareness, not all the programs scaffold skills effectively enough to prevent at-risk students from having reading difficulties.

The teachers at Prairie School will need to thoroughly evaluate a program for use with struggling students and make the necessary adaptations if these students are to reach the level of phonemic awareness of many of their peers. It is our hope that teachers like those at Prairie School will evaluate, select, and adapt their programs using the framework of examples provided in this article as a guide. To facilitate this process, we have provided a checklist that incorporates various scaffolding components (see Table 1). In addition, some current programs effectively incorporate examples of scaffolding in the instruction (see box, “Resources”).

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