

Phonological Awareness: Instructional and Assessment Guidelines

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This article defines phonological awareness and discusses historic and contemporary research findings regarding its relation to early reading. Common misconceptions about phonological awareness are addressed. Research-based guidelines for teaching phonological awareness and phonemic awareness to all children are described. Additional instructional design guidelines are offered for teaching children with learning disabilities who are experiencing difficulties with early reading. Considerations for assessing children's phonological awareness are discussed, and descriptions of available measures are provided.

Row, row, row your boat
gently down the stream.
Merrily, merrily, merrily, merrily;
Life is but a dream

Bow, bow, bow your boat
bently bown the beam.
Berrily, berrily, berrily, berrily;
Bife is but a beam.

Sow, sow, sow your soat
sently sown the seam.
Serrily, serrily, serrily, serrily;
Sife is sut a seam.

Activities like substituting different sounds for the first sound of a familiar song can help children develop phonological awareness, a cognitive substrate to reading acquisition. Becoming phonologically aware prepares children for later reading instruction, including instruction in phonics, word analysis, and spelling (Adams, Foorman, Lundberg, & Beeler, 1998; Chard, Simmons, & Kameenui, 1998). The most common barrier to learning early word reading skills is the inability to process language phonologically (Liberman, Shankweiler, & Liberman, 1989). Moreover, developments in research and understanding have revealed that this weakness in phonological processing most often hinders early reading development for both students with and without disabilities (Fletcher et al., 1994).

No area of reading research has gained as much attention over the past two decades as phonological awareness. Perhaps the most exciting finding emanating from research on phonological awareness is that critical levels of phonological awareness can be developed through carefully planned instruction, and this development has a significant influence on children's reading and spelling achievement (Ball & Blachman, 1991; Bradley & Bryant, 1985; Byrne & Fielding-Barnsley, 1989, 1991; O'Connor, Jenkins, Leicester, & Slocum, 1993). Despite the promising findings, however, many questions remain unanswered, and many misconceptions about phonological awareness persist. For example, researchers are looking for ways to determine how much and what type of instruction is necessary and for whom. Moreover, many people do not understand the difference between phonological awareness, phonemic awareness, and phonics. Still others are uncertain about the relationship between phonological awareness and early reading.

The purposes of this article are to (a) clarify some of the salient findings from research on phonological awareness and reading and (b) translate those findings into practical information for teachers of children with learning disabilities or children who are experiencing delays in early reading. To this end, we answer three questions:

1. What is phonological awareness, and why is it important to beginning reading success?
2. What are documented effective principles that should guide phonological awareness instruction?
3. What principles should guide the assessment of phonological awareness?

What is phonological awareness?

Phonological awareness is the understanding of different ways that oral language can be divided into smaller components and manipulated. Spoken language can be broken down in many different ways, including sentences into words and words into syllables (e. g., in the word simple, /sim/ and /ple/), onset and rime (e. g., in the word broom, /br/ and /oom/), and individual phonemes (e.g., in the word hamper, /h/, /a/, /m/, /p/, /er/). Manipulating sounds includes deleting, adding, or substituting syllables or sounds (e.g., say can; say it without the /k/; say can with /m/ instead of /k/). Being phonologically aware means having a general understanding at all of these levels.

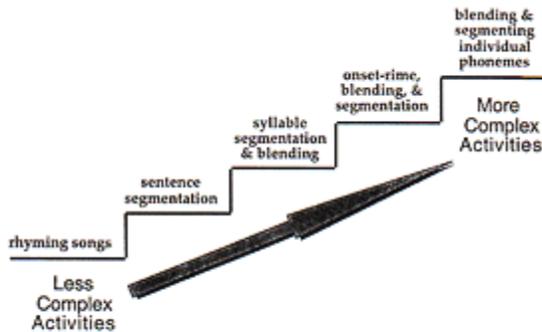


Figure 1. *A continuum of complexity of phonological awareness activities.*

Operationally, skills that represent children's phonological awareness lie on a continuum of complexity (see Figure 1). At the less complex end of the continuum are activities such as initial rhyming and rhyming songs as well as sentence segmentation that demonstrates an awareness that speech can be broken down into individual words. At the center of the continuum are activities related to segmenting words into syllables and blending syllables into words. Next are activities such as segmenting words into onsets and rimes and blending onsets and rimes into words.

Finally, the most sophisticated level of phonological awareness is phonemic awareness. Phonemic awareness is the understanding that words are made up of individual sounds or phonemes and the ability to manipulate these phonemes either by segmenting, blending, or changing individual phonemes within words to create new words. The recent National Research Council report on reading distinguishes phonological awareness from phonemic awareness in this way:

The term phonological awareness refers to a general appreciation of the sounds of speech as distinct from their meaning. When that insight includes an understanding that words can be divided into a sequence of phonemes, this finer-grained sensitivity is termed phonemic awareness. (Snow, Burns, & Griffin, 1998, p. 51)

Throughout this article we will use the term phonological awareness to mean an awareness at all levels from basic rhyme to phonemic awareness. Only in some specific instances will we use the term phonemic awareness.

At this point, it is important to note that phonological awareness differs distinctly from phonics. Phonological awareness involves the auditory and oral manipulation of sounds. Phonics is the association of letters and sounds to sound out written symbols (Snider, 1995); it is a system of teaching reading that builds on the alphabetic principle, a system of which a central component is the teaching of correspondences between letters or groups of letters and their pronunciations (Adams, 1990). Phonological awareness and phonics are intimately intertwined, but they are not the same. This relationship will be further described in the following section.

Children generally begin to show initial phonological awareness when they demonstrate an appreciation of rhyme and alliteration. For many children, this begins very early in the course of their language development and is likely facilitated by being read to from books that are based on rhyme or alliteration, such as the B Book by Stanley and Janice Berenstain, 1997, or Each Peach Pear Plum by Janet and Allan Ahlberg, 1979, (Bryant, MacLean, Bradley, & Crossland, 1990). As children grow older, however, their basic phonological awareness

does not necessarily develop into the more sophisticated phonemic awareness. In fact, developing the more complex phonemic awareness is difficult for most children and very difficult for some children (Adams et al., 1996). However, it is a child's phonemic awareness on entering school that is most closely related to success in learning to read (Adams, 1990; Stanovich, 1986).

Why is phonological awareness so important?

An awareness of phonemes is necessary to grasp the alphabetic principle that underlies our system of written language. Specifically, developing readers must be sensitive to the internal structure of words in order to benefit from formal reading instruction (Adams, 1990; Liberman, Shankweiler, Fischer, & Carter, 1974). If children understand that words can be divided into individual phonemes and that phonemes can be blended into words, they are able to use letter-sound knowledge to read and build words. As a consequence of this relationship, phonological awareness in kindergarten is a strong predictor of later reading success (Ehri & Wilce, 1980, 1985; Liberman et al., 1974; Perfetti, Beck, Bell, & Hughes, 1987). Researchers have shown that this strong relationship between phonological awareness and reading success persists throughout school (Calfee, Lindamood, & Lindamood, 1973; Shankweiler et al., 1995).

Over the past 2 decades, researchers have focused primarily on the contribution of phonological awareness to reading acquisition. However, the relationship between phonological awareness and reading is not unidirectional but reciprocal in nature (Stanovich, 1986). Early reading is dependent on having some understanding of the internal structure of words, and explicit instruction in phonological awareness skills is very effective in promoting early reading. However, instruction in early reading—specifically, explicit instruction in letter-sound correspondence appears to strengthen phonological awareness, and in particular the more sophisticated phonemic awareness (Snow, Burns, & Griffin, 1998).

Many children with learning disabilities demonstrate difficulties with phonological awareness skills (Shaywitz, 1996). However, many other children have such difficulty without displaying other characteristics of learning disabilities. Although a lack of phonemic awareness correlates with difficulty in acquiring reading skills, this lack should not necessarily be misconstrued as a disability (Fletcher et al., 1994). More important, children who lack phonemic awareness can be identified, and many of them improve their phonemic awareness with instruction. Furthermore, although explicit instruction in phonological awareness is likely to improve early reading for children who lack phonemic awareness, most children with or without disabilities are likely to benefit from such instruction (R. E. O'Connor, personal communication, June 2, 1998).

In short, success in early reading depends on achieving a certain level of phonological awareness. Moreover, instruction in phonological awareness is beneficial for most children and seems to be critical for others, but the degree of explicitness and the systematic nature of instruction may need to vary according to the learner's skills (Smith, Simmons, & Kameenui, 1998), especially for students at risk for reading difficulties. With this in mind, we discuss documented approaches to teaching phonological awareness.

Teaching phonological awareness

There is ample evidence that phonological awareness training is beneficial for beginning readers starting as early as age 4 (e.g., Bradley & Bryant, 1985; Byrne & Fielding-Barnsley, 1991). In a review of phonological research, Smith et al. (1998) concluded that phonological awareness can be developed before reading and that it facilitates the subsequent acquisition of reading skills. Documented effective approaches to teaching phonological awareness generally include activities that are age appropriate and highly engaging. Instruction for 4-year-olds involves rhyming activities, whereas kindergarten and first-grade instruction includes blending and segmenting of words into onset and rime, ultimately advancing to blending, segmenting, and deleting phonemes. This pattern of instruction follows the continuum of complexity illustrated in Figure 1. Instruction frequently involves puppets who talk slowly to model word segmenting or magic bridges that are crossed when children say the correct word achieved by synthesizing isolated phonemes. Props such as colored cards or pictures can be used to make abstract sounds more concrete. During the last few years, publishers have produced multiple programs in phonological awareness, some of which are based on research. Two of these programs are *Ladders to Literacy* (O'Connor, Notari-Syverson, & Vadasy, 1998) and *Teaching Phonemic Awareness* (Adams et al., 1996). Figures 2 through 4 are illustrations of phonemic awareness lessons that are based on examples from these programs.

Figure 2. Instructional activity that teaches synthesis of phonemes into words.

Guess-the-word game

Objective: Students will be able to blend and identify a word that is stretched out into its component sounds.

Materials Needed: Picture cards of objects that students are likely to recognize such as: sun, bell, fan, flag, snake, tree, book, cup, clock, plane

Activity: Place a small number of picture cards in front of children. Tell them you are going to say a word using "Snail Talk" a slow way of saying words (e.g., /ffffllllaaaag/). They have to look at the pictures and guess the word you are saying. It is important to have the children guess the answer in their head so that everyone gets an opportunity to try it. Alternate between having one child identify the word and having all children say the word aloud in chorus to keep children engaged.

Figure 3. An Instructional activity that teaches segmentation at multiple phonological levels.

Segmentation activities

Objectives: Students will be able to segment various parts of oral language.

Activity:

- a. Early in phonological awareness instruction, teach children to segment sentences into individual words. Identify familiar short poems such as "I scream you scream we all scream for ice cream!" Have children clap their hands with each word.
- b. As children advance in their ability to manipulate oral language, teach them to segment words into syllables or onsets and rimes. For example, have children segment their names into syllables: e.g., Ra-chel, Al-ex-an-der, and Rod-ney.
- c. When children have learned to remove the first phoneme (sound) of a word, teach them to segment short words into individual phonemes: e.g., s-u-n, p-a-t, s-t-o-p.

Figure 4. An instructional activity that teaches phoneme deletion and substitution.

Change-a-name game

Objective: Students will be able to recognize words when the teacher says the word with the first sound removed.

Activity: Have students sit in a circle on the floor. Secretly select one child and change their name by removing the first sound of the name. For example, change Jennifer to Ennifer or change William to Illiam. As you change the name, the children have to identify who you are talking about.

Extension Ideas: As children become better at identifying the child's name without the first sound, encourage them to try removing the beginning sounds of words and pronounce the words on their own.

After children learn how to remove sounds, teach them to substitute the beginning sound in their name with a new sound. The teacher can model this, beginning with easier sounds (common sounds of consonant s, e.g., /m/, /t/, /p/) and advancing to more complex sounds and sound blends (e.g., /ch/, /st/).

Most early phonological awareness activities are taught in the absence of print, but there is increasing evidence that early writing activities, including spelling words as they sound (i.e., invented or temporary spelling), appear to promote more refined phonemic awareness (Ehri, 1998; Treiman, 1993). It may be that during spelling and writing activities children begin to combine their phonological sensitivity and print knowledge and apply them to building words. Even if children are unable to hold and use a pen or pencil, they can use letter tiles or word processing programs to practice their spelling.

Instruction in phonological awareness can be fun, engaging, and age appropriate, but the picture is not as simple as it seems. First, evidence suggests that instruction in the less complex phonological skills such as rhyming or onset and rime may facilitate instruction in more complex skills (Snider, 1995) without directly benefiting reading acquisition (Gough, 1998). Rather, integrated instruction in segmenting and blending seems to provide the greatest benefit to reading acquisition (e.g., Snider, 1995). Second, although most children appear to benefit from instruction in phonological awareness, in some studies there are students who respond poorly to this instruction or fail to respond at all. For example, in one training study that provided 8 weeks of instruction in phonemic awareness, the majority of children demonstrated significant growth, whereas 30% of the at-risk students demonstrated no measurable growth in phonological awareness (Torgesen, Wagner, & Rashotte, 1994). Similarly, in a 12-week training in blending and segmenting for small groups (3-4 children) in 2-minute sessions four times a week, about 30% of the children still obtained very low scores on the segmenting posttest and 10 % showed only small improvements on the blending measures (Torgesen et al., 1994).

Torgesen et al. (1994) concluded that training for at-risk children must be more explicit or more intense than what is typically described in the research literature if it is to have a substantial impact on the phonological awareness of many children with severe reading disabilities. Therefore, we recommend two tiers of instruction. The first tier of instruction is the highly engaging, age-appropriate instruction that we introduced earlier. The second tier of instruction includes more intensive and strategic instruction in segmenting and blending at the phoneme level (e.g., Snider, 1995).

Beside content, another issue that requires attention in phonological awareness instruction is curriculum design. From research, we are able to deduce principles for effectively designing phonological awareness instruction. These design principles apply for all students but are particularly important for students who respond poorly to instruction. In the design of phonological awareness instruction, the following general principles increase students' success (Chard & Osborn, 1998):

- Start with continuous sounds such as /s/, /m/, and /f/ that are easier to pronounce than stop sounds such as /p/, /b/, and /k/;
- Carefully model each activity as it is first introduced;
- Move from larger units (words, onset-rime) to smaller units (individual phonemes);
- Move from easier tasks (e.g., rhyming) to more complex tasks (e.g., blending and segmenting); and,
- Consider using additional strategies to help struggling early readers manipulate sounds. These strategies may include using concrete objects (e.g., blocks, bingo chips) to represent sounds.

Research suggests that by the end of kindergarten children should be able to demonstrate phonemic blending and segmentation and to make progress in using sounds to spell simple words. Achieving these goals requires that teachers be knowledgeable about effective instructional approaches to teaching phonological awareness and be aware of the ongoing progress for each of their students. In the next section, we describe effective ways to assess phonological skills and monitor progress in phonological awareness.

Assessing phonological awareness

Assessment in phonological awareness serves essentially two purposes: to initially identify students who appear to be at risk for difficulty in acquiring beginning reading skills and to regularly monitor the progress of students who are receiving instruction in phonological awareness. The measures used to identify at-risk students must be strongly predictive of future reading ability and separate low and high performers. Measures used for monitoring progress must be sensitive to change and have alternate forms (Kaminski & Good, 1996). In this section, we discuss only measures that have been demonstrated to be valid and reliable. We report the technical adequacy of the measures in the Appendix, rather than in the narrative description of the measure.

As stated earlier, screening measures must be strongly predictive of future reading ability and must separate high from low performers. Measures of automatized color, object, number, or letter naming meet these criteria (Torgesen, Wagner, Rashotte, Burgess, & Hecht, 1997; Wolf, 1991). Segmentation is a second skill that is highly predictive of future reading ability (e.g., Nation & Hulme, 1997; Torgesen et al., 1994; Vellutino & Scanlon, 1987; Yopp, 1988). Unlike rapid naming, segmentation is a skill that can be taught, and the instruction of segmentation benefits reading acquisition.

Screening measures must also separate high from low performers. This means that they must address skills that are developmentally appropriate. Phonological awareness skills seem to develop along a continuum from rhyme to segmenting. Typically, students develop the ability to segment words into onset and rime during kindergarten and to segment words into separate phonemes between kindergarten and first grade. Therefore, most first-grade students perform well on an onset-rime measure, whereas most kindergarten students do poorly on a measure of segmenting into individual sounds. In either case it is difficult to separate low and high performers. Although we know a great deal about identifying students at risk for reading difficulties, many questions remain unanswered. We recommend that teachers use a variety of screening measures, including one that measures automatized rapid naming and one that measures phonemic awareness sensitivity or segmenting.

Typically, kindergarten students are screened for risk factors in acquiring beginning reading skills in the second semester of kindergarten. Appropriate screening measures for the second semester of kindergarten include measures that are strong predictors of a student's successful response to explicit phonemic awareness instruction or beginning reading acquisition. Such predictors of successful response to segmenting and blending instruction are the Test of Phonological Awareness-Kindergarten (TOPA-K; Torgesen & Bryant, 1993), a Nonword Spelling measure (Torgesen & Davis, 1996), and the Digit Naming Rate (Torgesen & Davis, 1996). Predictors of the successful acquisition of beginning reading skills include automatized naming of colors, objects, numbers, or letters (e.g., Wolf, 1991) and segmenting ability (e.g., Nation & Hulme, 1997; Torgesen et al., 1994; Vellutino & Scanlon, 1987; Yopp, 1988). Other measures used during the second semester of kindergarten to identify students at risk for not acquiring beginning reading skills include measures of phoneme deletion.

The measures appropriate for identifying first-grade students at risk for not acquiring reading skills overlap those used in kindergarten. The TOPA-K and onset-rime are no longer appropriate, as students should have developed these skills by the end of kindergarten, whereas segmenting is still an emerging skill. However, tasks such as automatized naming of colors, objects, numbers, or letters remain predictors for students at risk for not acquiring beginning reading skills, as do measures to determine whether students lag behind their peers in phonological awareness, such as measures of segmenting.

When using screening measures, the teacher must establish decision rules for identifying students requiring phonological awareness instruction. The decision rules vary. The TOPA-K has normed scores and provides information to help a teacher decide whether to provide phonemic awareness instruction to students who score one or two standard deviations below the mean. However, there is little research evidence to guide decision making about which children should receive the more intensive phonological awareness instruction.

A second use of measures is to monitor students' progress. Unlike the screening measures, progress-monitoring measures must be sensitive to growth and require multiple forms. The Dynamic Indicators of Early Literacy (Kaminski & Good, 1996) fit this requirement and are appropriate for kindergarten and first grade. After the first semester of first grade, teachers may also be interested in monitoring their students' progress in generalizing phonemic awareness to reading and spelling. Two other measures of reading that are sensitive to growth and have alternative forms are oral reading fluency (tasks) and nonsense word reading fluency (Tindal & Marston, 1990).

As with screening measures, teachers must establish decision rules about how to gauge the progress of their students. One way is to establish a baseline by graphing three measurement points before the start of instruction, adding each subsequent data point to the graph, and checking the slope of students' progress. If many students are making slower progress than necessary to reach the level of their average-achieving peers, the teacher can modify the instruction by increasing one or more of the elements in the instructional guidelines. For example, if students are not acquiring segmenting, the teacher may decide to add more scaffolds, such as cards that the students can move as they segment words, thereby making segmenting instruction more explicit, or provide students with more guided practice. If most students successfully respond to instruction but a few respond poorly or not at all, the teacher may decide to place these students in a flexible group to receive more intense instruction. The teacher could also choose to provide some individuals with more intense instruction throughout the day to keep them up with their peers. If the progress-monitoring measures indicate that the first-grade students receiving instruction in phonological awareness lag behind their peers in reading or spelling, the teacher may choose to increase the integrated instruction in letter-sound correspondence and to make stronger the links between segmenting and blending skills and reading. Brief descriptions of the screening and monitoring measures that have demonstrated validity and reliability through research follow. For each measure, we indicate the grade and purpose for which

the measure is appropriate. Note that some measures are appropriate for more than one grade level and for both screening and monitoring progress.

Test of phonological awareness- kindergarten

(Second Half of Kindergarten; Screen). This measure of phonemic sensitivity strongly predicts which students will demonstrate high segmenting ability following small-group instruction in phonemic awareness (Torgesen & Davis, 1996). The measure consists of one form with 10 items requiring students to indicate which of three words (represented by pictures) have the same first sound as a target word and 10 items that require students to indicate which of four words (represented by pictures) begins with a different first sound than the other three. The measure is administered to small groups of 6 to 10 children and is untimed. Students receive raw scores that are normed.

Nonword spelling

(Second Half of Kindergarten; Screen). This measure strongly predicts which kindergarten students will demonstrate growth in blending and segmenting after small-group phonological awareness instruction. Five nonwords (feg, rit, mub, gof, pid) comprise the measure. Students receive one point for each phoneme that they represent correctly in the spelling.

Digit naming rate

(Second Half of Kindergarten; Screen). This measure strongly predicts which kindergarten students are likely to demonstrate growth in blending after small-group phonological awareness instruction. The measure consists of six rows with five single digits per row on an 8 " x 11 " card. The students are timed as they name the digits as fast as they can, beginning at the top and continuing to the bottom. Students complete two trials using cards with differently arranged numbers. The score is based on the average time for the two series.

Yopp-Singer Test of phoneme segmentation

(Second Half of Kindergarten, First Grade; Screen). This test (Yopp, 1995) consists of 22 items and requires students to separately articulate each phoneme in the presented words. The student receives credit only if all sounds in a word are presented correctly. The student does not receive partial credit for saying /c/ or /c/ /at/ for cat. One feature that differentiates this screening measure from others is that students receive feedback after each response. If the child's response is correct, the test administrator says, "That's right." If the student gives an incorrect response, the examiner tells the student the correct response. Moreover, if the student gives an incorrect response, the examiner writes the error. Recording the errors helps the teacher decide what remediation the student requires. The student's score is the number of items correctly segmented into individual phonemes. The test is administered individually and requires about 5 to 10 minutes per child.

Bruce test of phoneme deletion

(Second Half of Kindergarten; Screen). The Bruce (1964) test assesses phoneme deletion, a more difficult and compound skill than segmenting (Yopp, 1995). The measure consists of 30 one- to three-syllable words drawn from words familiar to children between the ages of 5 and 6 1/2. The examiner asks students to delete one phoneme from the beginning, middle, or end of a word and to say the word that remains. The positions of deleted phonemes are randomly ordered throughout the test. The test is individually administered and requires 10 minutes to administer.

Auditory analysis test

(Second Half of Kindergarten; Screen). This measure (Rosner & Simon, 1971, cited in MacDonald & Cornwall, 1995) consists of 40 items arranged in order of difficulty from deletion of syllables in compound words to deletion of syllables in multisyllabic words to deletion of phonemes in beginning, middle, and end positions. The teacher asks the student to delete a syllable or phoneme and say the word that is left. The measure is administered individually.

Rapid letter naming, dynamic indicators of basic early literacy skills

(Second Half of Kindergarten, First Grade; Screen). The Rapid Letter Naming, DIBELS (Kaminski & Good, 1996) is another of many measures used to assess the rapid letter-naming ability of students. The measure has 18 alternate forms and consists of 104 randomly selected upper- and lowercase letters presented on one page. The measure is given individually, and students have 1 minute to name as many letters as possible in the order that they appear on the page.

Phoneme segmentation fluency, DIBELS

(End of Kindergarten, First Grade; Screen, Monitor Progress). The Phoneme Segmentation Fluency, DIBELS (Kaminski & Good, 1996) is one of many segmenting measures. The measure has 18 alternate forms. Each form consists of 10 words, each with two or three phonemes, randomly selected from words in the pre-primer and primer levels of the Scribner basal reading series. The measure is administered individually and is timed. Unlike the Yopp-Singer Test, students do not receive feedback on their responses but do receive scores for partially correct answers. In other words, for cat, a student receives a score of 1 for saying /c/, a score of 2 for saying /c/ /a/, or a score of 3 for saying /c/ /a/ /t/. Because this measure assesses the number of correct phonemes per minute, it is sensitive to growth and is, therefore, appropriate for both screening and monitoring progress.

Conclusion

As we noted at the outset of this article, efforts to understand the role of phonological awareness have far exceeded the efforts to relate research findings to classroom practice regarding phonological awareness. This article is an attempt to pull together the valuable information available on the role that phonological awareness plays in early reading development, the research-based teaching strategies that address the needs of all children, the instructional design principles that address the needs of children experiencing delays in early reading development, and the validated instruments available for screening and monitoring students' progress in phonological awareness.

Our description of the role that phonological awareness plays in reading development conspicuously fails to address the connection of phonological awareness and spelling. This failure is not an oversight, nor should it be perceived as a statement of our beliefs regarding the importance of spelling. We firmly believe that findings from spelling research (e.g., Ehri, 1998; Templeton, 1995; Treiman, 1993) represent such a significant part of our knowledge base about reading that they would go far beyond the length and scope of this article.

Recent research on phonological awareness and phonemic awareness, including how to teach and assess them, has made an extremely valuable contribution to our understanding of how to teach reading to children with learning disabilities or delays in early reading. It is not, however, a cure for reading disabilities, but a significant advance in preventing and correcting reading difficulties so that more children are prepared to learn how to read in our alphabetic writing system.

About the authors

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Appendix

Table A. Technical Adequacy of Screening and Monitoring Measures

Measure	Validity	Reliability
Test of Phonological Awareness-Kindergarten (Torgesen & Bryant, 1993)	Concurrent validity with segmenting and sound isolation (.50-.55); Concurrent validity with word identification and word analysis of Woodcock Reading Mastery Test-Revised (.60-.66); Predictive validity (.59-.75)	Internal consistency (.90-.91); Total score reliability (Cronbach's Alpha = .91)
Nonword Spelling (Torgesen & Davis, 1996)		Internal consistency (.88)
Digit Naming Rate (Torgesen & Davis, 1996)		Split-half reliability (.91)
Yopp-Singer Test of Phoneme Segmentation (Yopp, 1995)	Construct validity with subtests of California Achievement Test (.38-.78); Predictive of reading and spelling in Grades 1-6 (-.05-.55; 16 of the 25 correlations were positive and significant)	Cronbach's Alpha (.95)
Bruce Phoneme Deletion Test (Bruce, 1964)	Predictive validity to learning to read novel words (.67)	Cronbach's Alpha (.92)
Auditory Analysis Test (Rosner & Simon, 1971, cited in MacDonald & Cornwall, 1995; Yopp, 1988)	Predictive validity (accounted for 25% of the variance in word identification and spelling skills at age 17); Construct validity for compound phonemic awareness	Cronbach's Alpha (.78)
Rapid Letter Naming (DIBELS)	Concurrent criterion-related with the Standard Diagnostic Reading Test (.50) and oral reading fluency (.45)	Spearman-Brown Prophecy formula (.83 for first grade)
Segmenting Fluency (DIBELS)		Alternate form reliability (.60 Spearman Prophecy formula)
Oral Reading Fluency (Children's Educational Services, 1987)	Coefficient with Stanford Diagnostic Reading Test, Woodcock Reading Mastery Test-Revised, and Peabody Individual Achievement Test (.52-.91)	Alternate form reliability (.97)
Nonsense Word Fluency (DIBELS; R. H. Good, August 3, 1998, personal communication)	Criterion reliability with curriculum-based reading measures (.80)	Alternate form reliability (high .80s)

This technique is recommended by research

Phonological Awareness has been recommended as a practice with solid research evidence of effectiveness for individuals with Learning Disabilities by Council for Exceptional Children-the Division for Learning Disabilities (DLI) and the Division for Research (DR). To learn more, please read [Current Practice Alert: Phonological Awareness](#).

If you have students in your classroom who are English Language Learners, pay special attention to the section titled "What Questions Remain."

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