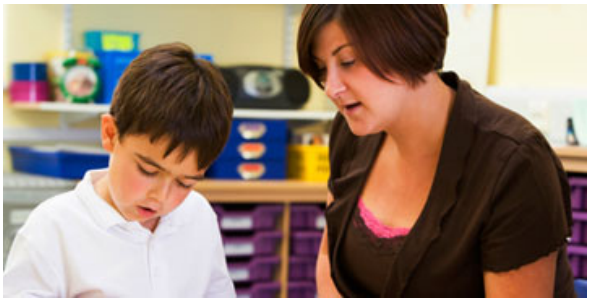
Launching young readers!

Reading Rockets

Catch Them Before They Fall: Identification and Assessment to Prevent Reading Failure in Young Children

By: Joseph K. Torgesen



Early identification is crucial when it comes to helping children who are having trouble learning to read. This seminal article by Joseph Torgesen explains the assessment process and reviews the more commonly used assessment tools.

One of the most compelling findings from recent reading research is that children who get off to a poor start in reading rarely catch up. As several studies have now documented, the poor first-grade reader almost invariably continues to be a poor reader (Francis, Shaywitz, Stuebing, Shaywitz, & Fletcher, 1996; Torgesen & Burgess, 1998).

And the consequences of a slow start in reading become monumental as they accumulate exponentially over time. As Stanovich (1986) pointed out in his well-known paper on the "Matthew effects" (the rich get richer and the poor get poorer) associated with failure to acquire early word reading skills, these consequences range from negative attitudes toward reading (Oka & Paris, 1986), to reduced opportunities for vocabulary growth (Nagy, Herman, & Anderson, 1985), to missed opportunities for development of reading comprehension strategies (Brown, Palinscar, & Purcell, 1986), to less actual practice in reading than other children receive (Allington, 1984).

The best solution to the problem of reading failure is to allocate resources for early identification and prevention.

It is a tragedy of the first order that while we know clearly the costs of waiting too long, few school districts have in place a mechanism to identify and help children before failure takes hold. Indeed, in the majority of cases, there is no systematic identification until third grade, by which time successful remediation is more difficult and more costly.

School-based preventive efforts should be engineered to maintain growth in critical word reading skills at *roughly normal* levels throughout the early elementary school period. Although adequate development of these skills in first grade does not guarantee that children will continue to

maintain normal growth in second grade without extra help, to the extent that we allow children to fall seriously behind at any point during early elementary school, we are moving to a "remedial" rather than a "preventive" model of intervention. Once children fall behind in the growth of critical word reading skills, it may require very intensive interventions to bring them back up to adequate levels of reading accuracy (Allington & McGill-Franzen, 1994; Vaughn & Schumm, 1996), and reading fluency may be even more difficult to restore because of the large amounts of reading practice that is lost by children each month and year that they remain poor readers (Rashotte, Torgesen, & Wagner, 1997).

The purpose of this article is to provide practical advice about methods to prevent reading failure that is grounded in the new knowledge about reading we have acquired over the past two decades. My primary focus will be on early identification of children at risk for problems in learning to read as well as methods for monitoring the growth of critical early reading skills. The goal is to describe procedures that will allow educators to *identify children who need extra help in reading before they experience serious failure* and to monitor the early development of reading skill to *identify children who may require extra help as reading instruction proceeds* through elementary school.

The advice provided in this article is based on the research my colleagues Richard Wagner, Carol Rashotte, and I have been conducting on both prediction and prevention of reading disabilities (Torgesen, Wagner, & Rashotte, 1994; 1997; Wagner, et al., 1994; 1997) as well as the work of many other researchers that was reviewed in an earlier issue of this magazine (Summer, 1995). It is guided by several important assumptions and facts about reading, reading growth, and reading failure that will be discussed first. Following this description of assumptions and a brief outline of some critical dimensions of preventive instruction, I will describe a number of specific measures and procedures that should prove useful as educators seek ways to focus more intensive instruction on children whose needs are greatest.

Assumptions about reading, reading growth, and reading failure

Most of the points that will be discussed in this section are not, in fact, mere assumptions about reading, but, rather, are well-established facts. However, I use the word assumption here to convey the sense either that the ideas are self-evident or that they are now assumed to be true based on consistent research findings. The first of these "assumptions" is, in fact, a self-evident value judgment.

Adequate reading comprehension is the most important ultimate outcome of effective instruction in reading

The ultimate purpose of reading instruction is to help children acquire the skills that enable learning from, understanding, and enjoyment of written language. This "assumption" is not controversial. No matter what one's personal preferences for instructional method, the end goal is to help children comprehend written material at a level that is consistent with their general intellectual abilities.

Two general types of skill and knowledge are required for good reading comprehension

Consistent with Gough's "simple view of reading" (1996), comprehension of written material requires:

- General language comprehension ability
- Ability to accurately and fluently identify the words in print

Knowledge and active application of specific reading strategies is also required to maximize reading comprehension (Mastropieri & Scruggs, 1997) but most of the variability among children and adults in comprehension of written material can be accounted for by measuring the two broad families of skills identified in Gough's simple view (Hoover & Gough, 1990).

That is, good general language comprehension and good word reading skills are the most critical skills required for effective comprehension of written material.

Most children who become poor readers experience early and continuing difficulties in learning how to accurately identify printed words

This difficulty is expressed most directly on two kinds of reading tasks. First, children destined to be poor readers at the end of elementary school almost invariably have difficulties understanding and applying the alphabetic principle in deciphering unfamiliar words. These children have unusual difficulties learning to use the regular patterns of correspondence between letters and sounds in words as an aid in identifying new words they encounter in text (Siegel, 1989). They have trouble "sounding out" unknown words.

Second, poor readers at all grade levels are characterized by slower than normal development of a "sight vocabulary" of words they can read fluently and automatically. Ultimately, it is this difficulty in rapid word recognition that limits comprehension in older poor readers, for these skills allow children to focus on constructing the meaning of what they are reading rather than spending too many of their intellectual resources on trying to identify the words (Adams, 1990). The strongest current theories of reading growth link phonetic and "sight word" reading skills together by showing how good phonetic reading skills are necessary in the formation of accurate memory for the spelling patterns that are the basis of sight word recognition (Ehri, in press; Share & Stanovich, 1995).

The most common cause of difficulties acquiring early word reading skills is weakness in the ability to process the phonological features of language

This is perhaps the most important discovery about reading difficulties in the last twenty years. Weaknesses in the phonological area of language development can be measured by a variety of non-reading tasks, but the ones most commonly used assess phonemic awareness, which can be defined simply as the ability to identify, think about, or manipulate the individual sounds in words. Much of our new confidence in being able to identify children at risk for reading failure before reading instruction begins depends on the use of tests of phonemic awareness, since this ability has been shown to be causally related to the growth of early word reading skills (Lundberg, Frost, & Peterson, 1988; Wagner, et al., 1997). (Liberman, Shankweiler, & Liberman, 1989)

Discovery of the core phonological problems associated with specific reading disability has had at least one unanticipated consequence. The ability to assess these core language problems directly has led to the discovery that the early word reading difficulties of children with relatively low general intelligence and verbal ability are associated with the same factors (weaknesses in phonological processing) that interfere with early reading growth in children who have general intelligence in the normal range (Fletcher, et al., 1994; Share & Stanovich, 1995; Stanovich & Siegel, 1994). So, weaknesses in phonemic awareness characterize children with reading problems across a broad span of general verbal ability.

On the one hand, many children enter school with adequate general verbal ability and cognitive weaknesses limited to the phonological/ language domain. Their primary problem in learning to read involves learning to translate between printed and oral language. On the other hand, another significant group of poor readers, composed largely of children from families of lower socioeconomic or minority status, enter school significantly delayed in a much broader range of pre-reading skills (Whitehurst & Lonigan, in press). Since these children are delayed not only in phonological but also in general oral language skills, they are deficient in both of the critical kinds of knowledge and skill required for good reading comprehension. Even if these children can acquire adequate word reading skill, their ability to comprehend the meaning of what they read may be limited by their weak general verbal abilities.

Children with general oral language weaknesses require extra instruction in a broader range of knowledge and skills than those who come to school impaired only in phonological ability. What is well established at this point, though, is that *both kinds of children* will require special support in the growth of early word reading skills if they are to make adequate progress in learning to read.

Back to Top

Elements of an effective preventive program in reading

The most critical elements of an effective program for the prevention of reading disability at the elementary school level are:

- The right kind and quality of instruction delivered with
- The right level of intensity and duration to
- The right children at
- The right time.

I will briefly consider each of these elements in turn.

The right kind and quality of instruction

It is beyond the scope of this article to discuss instructional methods for children with phonological processing weaknesses in any depth at all. In broad stroke, they will benefit from the same approach to reading instruction as children with normal abilities in this area – structured, systematic, and explicit – but for this at-risk group, such instruction is not just beneficial, it is critical. As experienced teachers understand (Gaskins, et al., 1996), we cannot assume that these children will acquire any necessary skill for reading words unless they are directly taught that skill or knowledge and receive sufficient opportunities to practice it. Some of the word-level skills and knowledge these children will require instruction on include: phonemic awareness, letter-sound correspondences, blending skills, a small number of pronunciation conventions (i.e., silent "e" rule), use of context to help specify a word once it is partially or completely phonemically decoded, strategies for multi-syllable words, and automatic recognition of high-frequency "irregular" words. It goes almost without saying that this type of instruction should be embedded within as many opportunities for meaningful reading and writing as possible.

The lesson from recent large-scale prevention studies (Brown & Felton, 1990; Foorman, et al., 1998; Torgesen, et al., 1998; Vellutino, et al., 1997) is that it is possible to maintain critical word reading skills of most children at risk for reading failure at roughly average levels if this type of instruction is provided beginning sometime during kindergarten or first grade. However, it is also true that in all studies conducted to date, substantial proportions of children with the most severe weaknesses remain significantly impaired in these critical skills following intervention. For example, if we adopt the 30th percentile as a standard for adequate reading progress, then the proportion of the total population remaining at risk in spite of the best interventions tested to date ranges from 5 percent to 7 percent (Torgesen, 1998). Although these results are clearly better than the 30 percent to 60 percent of children who frequently fall below these standards without special interventions, they nevertheless suggest that there is a core of disabled readers in the population for whom we have not yet solved the reading puzzle.

It is almost certain that some additional answers to this question will come as we direct our attention to the quality and intensity, as well as the content, of our instruction. For example, Juel (1996) has shown the importance of a particular kind of "scaffolded" interaction between teacher and child in increasing understanding and application of phonemic reading skills, and these types of interactions are also prescribed in the teacher manuals of at least two widely used instructional programs designed for children with reading disabilities (Lindamood & Lindamood, 1984; Wilson, 1988). We turn now to a brief consideration of issues surrounding intensity of instruction.

The right level of intensity

Greater intensity and duration of instruction is required because the increased explicitness of instruction for children who are at risk for reading failure requires that more things be taught directly by the teacher. Intensity of instruction is increased primarily by reducing teacher/ student ratios. Unless beginning reading instruction for children with phonological weaknesses is more intensive (or lasts significantly longer) than normal instruction, these children will necessarily lag significantly behind their peers in reading growth. An effective preventive program may involve several levels of instructional intensity ranging from small-group to one-on-one instruction, depending upon the severity of the risk factors for each child.

The right children at the right time

These factors are considered together because they are both tied directly to the availability of accurate identification procedures at various age levels. That is, to be most efficient, a preventive program should be focused on the children who are most in need of special instruction. The efficiency of the entire process will be improved if procedures are available to accurately target the right children very early in the process of reading instruction. Although timing issues with regard to preventive instruction have not been completely resolved by research (Torgesen, et al., 1998), we do know, for example, that instruction in phonological awareness during kindergarten can have a positive effect on reading growth after formal reading instruction begins in the first grade (Lundberg, Frost, & Peterson, 1988). Thus, I have proceeded on the assumption that it will be useful to identify high-risk children at some time during the kindergarten year so that preventive work may begin as early as possible.

Back to Top

How accurate are currently available early identification procedures?

As stated earlier, the primary purpose of this article is to make some practical suggestions about procedures and tests that can be used to identify children for preventive reading or pre-reading instruction. From the outset, however, it is important to recognize that our ability to predict which children will have the most serious reading difficulties is still far from perfect. For example, in a recent comprehensive review of early identification research (1998), Scarborough pointed out that all studies continue to report substantial levels of two kinds of prediction errors.

False positive errors are made when children who will eventually become good readers score below the cutoff score on the predictive instrument and are falsely identified as "at risk." In general, the proportion of this type of error has ranged between 20 percent and 60 percent, with an average of around 45 percent. That is, almost half of the children identified during kindergarten as "at risk" turn out not to have serious reading problems by the end of first grade.

False negative errors occur when children who later exhibit reading problems are identified as not being at risk. Typical percentages of false negative errors range from 10 percent to 50 percent, with an average of around 22 percent. That is, on average, current procedures fail to identify about 22 percent of children who eventually end up with serious reading difficulties.

In any given study, the relative proportion of false positive and false negative errors is somewhat arbitrary, since it depends on the level of the cutoff score. For example, we reported a significant reduction in the percentage of false negative errors within the same sample of children by doubling the number of children we identified as at risk (Torgesen, in press; Torgesen & Burgess, 1998). Our goal was to identify, during the first semester of kindergarten, the children most at risk to be in the bottom 10 percent in word reading ability by the beginning of second grade. When we selected the 10 percent of children who scored lowest on our predictive tests, our false negative rate was 42 percent (we missed almost half the children who became extremely poor readers). However, when we identified the 20 percent of children who scored lowest on our measures, the false negative rate was reduced to 8 percent.

As a practical matter, if schools desire to maximize their chances for early intervention with the most impaired children, they should provide this intervention to as many children as possible. This is less of a waste of resources than it might seem at first glance, because, although many of the falsely identified children receiving intervention may not be among the most seriously disabled readers, most of them are likely to be below-average readers (Torgesen & Burgess, 1998).

Two other pieces of information are relevant to the selection of procedures for early identification of children at risk for reading difficulties. First, prediction accuracy increases significantly the longer a child has been in school. Prediction of reading disabilities from tests given at the beginning of first grade is significantly more accurate than from tests administered during the first semester of kindergarten (Scarborough, 1998; Torgesen, Burgess, & Rashotte, 1996). Given the widely varying range of children's preschool learning opportunities, many children may score low on early identification instruments in the first semester of kindergarten simply because they have not had the opportunity to learn the skills.

However, if pre-reading skills are actively taught in kindergarten, some of these differences may be reduced by the beginning of the second semester of school. Thus, I would recommend that the screening procedures described here not be administered until the beginning of the second semester of kindergarten, at which time they will be much more efficient in identifying children who will require more intensive preventive instruction in phonemic awareness and other early reading skills.

Second, although batteries containing multiple tests generally provide better prediction than single instruments, the increase in efficiency of multi-test batteries is generally not large enough to warrant the extra time and resources required to administer them (Scarborough, 1998). Thus, I recommend an identification procedure involving administration of two tests:

- A test of knowledge of letter names or sounds
- A measure of phonemic awareness

Measures of letter knowledge continue to be the best single predictor of reading difficulties, and measures of phonemic awareness contribute additional predictive accuracy.

In our experience, tests of letter name knowledge are most predictive for kindergarten children, and tests of letter-sound knowledge are most predictive for first graders. Since reading growth is influenced by non-cognitive factors such as attention/ motivation and home background (Torgesen, et al., 1998), as well as specific knowledge and skills, scores from these objective tests might profitably be supplemented with teacher ratings of behavior and attention to identify children most at risk for subsequent difficulties in learning to read.

Back to Top

How should phonemic awareness be assessed?

Since researchers first began to study phonological awareness in the early 1970s, more than twenty different tasks have been used to measure awareness of phonemes in words. These measures can be grouped into three broad categories: sound comparison, phoneme segmentation, and phoneme blending.

- **Sound comparison** tasks use a number of different formats that all require children to make comparisons between the sounds in different words. For example, a child might be asked to indicate which word (of several) begins or ends with the same sound as a target word (i.e., "Which word begins with the same first sound as *cat*: *boy*, *cake*, or *fan*?"). Additionally, tasks that require children to generate words that have the same first or last sound as a target word would fall in this category. Sound comparison tasks are among the least difficult measures of phonemic awareness, and thus are particularly appropriate for kindergarten age children.
- **Phoneme segmentation** tasks involve counting, pronouncing, deleting, adding, or reversing the individual phonemes in words. Common examples of this type of task require pronouncing the individual phonemes in words ("Say the sounds in *cat* one at a time."), deleting sounds from words ("Say *card* without saying the /d/ sound."), or counting sounds ("Put one marker on the line for each sound you hear in the word *fast*.")
- **Phoneme blending** skill has only been measured by one kind of task. This is the sound-blending task in which the tester pronounces a series of phonemes in isolation and asks the child to blend them together to form a word (i.e., "What word do these sounds make, /f/ /a/ /t/?"). Easier variants of the sound-blending task can be produced by allowing the child to choose from two or three pictures of the word that is represented by a series of phonemes.

In general, these different kinds of phonemic awareness tasks all appear to be measuring essentially the same construct, or ability. Although some research (Yopp, 1988) has indicated that the tasks may involve different levels of intellectual complexity, and there may be some differences between segmentation and blending tasks at certain ages (Wagner, Torgesen, & Rashotte, 1994), for the most part, they all seem to be measuring growth in the same general ability (Hoien, et al., 1995; Stanovich, Cunningham, & Cramer, 1984).

Sound comparison measures are easiest and are sensitive to emergent levels of phonological awareness, while segmentation and blending measures are sensitive to differences among children during later stages of development involving refinements in explicit levels of awareness. Measures of sensitivity to rhyme ("Which word rhymes with *cat*: *leg* or *mat*?") are not included as measures of phonemic awareness because they appear to be measuring something a little different, and less predictive of reading disabilities, from those measures that ask children to attend to individual phonemes.

For the same reason, measures of syllable awareness are not included in this group. Measures of phonemic awareness that are suited for early identification purposes include the following three widely used tests:

The Phonological Awareness Test

This test contains five different measures of phonemic awareness, plus a measure of sensitivity to rhyme. The five measures of phonemic awareness are:

- Segmentation of phonemes

- Phoneme isolation
- Phoneme deletion
- Phoneme substitution
- Phoneme blending

The phoneme isolation test, which requires children to pronounce the first, last, or middle sounds in words, would appear to have the most appropriate level of difficulty for kindergarten screening (the test should be easy enough so that only the most delayed children will do poorly on it), and any of the others could be used for first- or second-grade assessments. *The Phonological Awareness Test* is nationally normed on children from age five through nine, and it can be ordered from LinguiSystems, 3100 4th Avenue, East Moline, IL 61244-0747. Phone: (800) 776-4332. The cost of a test manual, test supplies, and fifteen test booklets is $69. (Robertson & Salter, 1995)

The Test of Phonological Awareness

This test was designed as a group-administered test of phonemic awareness for kindergarten and first-grade children. It was specifically constructed to be most sensitive to children with weaknesses in development in this area, which helps make it appropriate for identifying at-risk children. The kindergarten version of the test requires children to notice which words (represented by pictures) begin with the same first sound, while the first-grade version asks them to compare words on the basis of their last sounds. It can be easily administered to groups of five to ten children at a time. *The Test of Phonological Awareness* is nationally normed, and it can be ordered from PROED Publishing Company, 8700 Shoal Creek Blvd., Austin, TX 78757-6897. Phone: (512) 451-3246. The cost of a test manual and a supply of fifty test forms (twenty-five kindergarten version, twenty-five elementary school version) is $124. (Torgesen & Bryant, 1994)

The Yopp-Singer Test of Phoneme Segmentation

This assessment is a brief test of children's ability to isolate and pronounce the individual phonemes in words. This is a task that has been widely used in research on phoneme awareness over the past twenty years, and it is highly correlated with other measures of phoneme awareness. The test was designed for children in kindergarten, but it should also be appropriate for identifying children who are weak in phonemic awareness during first grade. The test has twenty-two items that are all of the same type and that ask the child to pronounce each of the phonemes in words that vary from two to three phonemes in length. The test does not have norms with it, but it is available free in volume 49 (1995) of the widely read journal *The Reading Teacher*, pp. 20-29. (Yopp, 1995)

Back to Top

The measurement of letter knowledge

In all of our research, we have measured letter knowledge in two ways. We measure *letter name* knowledge by presenting each letter in simple uppercase type on a single card and asking for its name. The score on this test is simply the number of letters for which the child can give the appropriate name. We measure *letter-sound* knowledge by presenting all letters in lowercase type and asking for the "sound the letter makes in words." If a consonant letter can commonly represent two different sounds (i.e., *c*, *g*) we probe for the second sound, and we also ask for the long and short pronunciation of each vowel. The score is the total number of sounds the child can give. We have found that letter-name knowledge is a more sensitive predictor for kindergarten children, while letter-sound knowledge is a better predictor for children in first grade. Two tests that provide nationally standardized norms for performance on letter-name and letter-sound knowledge are:

The *letter identification* sub-test of the *Woodcock Reading Mastery Test-Revised*

This test does not measure simple letter-name knowledge in the way we assess it, because it presents letters in several different fonts, some of which may be unfamiliar to children. It also allows children to give either the name or the sound the letter makes in words. However, children who perform poorly in kindergarten (do not know the names of very many letters) will not reach the more difficult items, so that their score should be quite comparable to a more straightforward test of letter-name knowledge. *The Reading Mastery Test-Revised* is available from American Guidance Service, 4201 Woodland Road, Circle Pines, MN 55014-1796. Phone (800) 328-2560. The cost for the manual and forms is $314.95. (Woodcock, 1987)

The *graphemes* sub-test of the *Phonological Awareness Test*

This test provides a comprehensive assessment of letter-sound knowledge extending from single consonants (i.e., *b*, *c*, *k*, *m*) through vowel digraphs and diphthongs (i.e., *ea*, *ai*, *ow*, *oy*). As mentioned before, it is standardized on children from aged five through nine. (Robertson & Salter, 1995)

Back to Top

Is it necessary for a test to be nationally standardized for it to be useful in early identification?

This issue is important because of the potential expense of employing standardized measures in large-scale screening efforts. Nationally based norms are *not* required to identify which children within a given classroom or school are weakest in phonemic awareness and letter knowledge.

However, the proportion of children who come to school with weak skills and knowledge in these areas will depend somewhat on specific aspects of their preschool language and literacy environment and will almost certainly vary from school to school across different communities. Tests with national norms can help to pinpoint classes or schools in which a special effort must be made to enhance phonological awareness in children prior to, or during, reading instruction. For example, a classroom in which 75 percent of the children performed below the 20th percentile (in the bottom 20 percent of all children), will require more instructional resources to prepare children for learning to read than a classroom in which only 10 percent of the children scored that low.

Without norms, it is possible to identify weak children within a given class or school, but it is not possible to determine what proportion of children in the entire school may require intervention because of relatively weak pre-reading skills and knowledge. On the one hand, if classroom resources allow extra help for only a fixed number of children (say, 20 percent to 30 percent), then measures without national norms can be used to identify the group of children within the classroom most in need of intervention. On the other hand, if the goal is to determine the amount of resources that may be needed to help all children with relatively weak skills in these areas, then normative measures will be required.

The combination of letter knowledge and phonemic awareness tests I have recommended should take no more than ten to fifteen minutes per child to administer. The tests do not require highly trained personnel to administer them, although anyone who tests young children must be very familiar with the tests and be able to establish a supportive rapport.

Back to Top

Monitoring growth in early reading skills

Once reading instruction begins, the best predictor of future reading growth is current reading achievement, and the most critical indicators of good progress in learning to read during the early elementary period are measures of word reading skill. Children who end up as poor readers at the end of elementary school are almost invariably those who fail to make normal progress in these skills during the first years of elementary school. These children are most frequently impaired in both the ability to apply phonetic strategies in reading new words and in the ability to retrieve sight words from memory. They not only have difficulty becoming accurate in the application of these processes but also they frequently have special difficulties with becoming fluent in their application. Before discussing specific methods for the diagnostic assessment of these word reading skills, one general issue regarding reading assessment requires discussion.

First, the assessment that will be recommended here is very different from the "authentic literacy assessment" that is currently advocated by many reading professionals (Paris, et al., 1992). Authentic assessment is different in at least two ways from the reading assessment measures we will be discussing. First, the goal of "authentic assessment" is to measure children's application of broad literacy skills to authentic tasks, like gathering information for a report, use of literacy as a medium for social interactions, or ability to read a selection and then write a response to it. It also seeks to measure children's enjoyment, ownership, and involvement in literacy activities both at school and at home.

This kind of assessment is a clear complement to the type of assessments we will describe for monitoring growth in word level reading skills. All of the literacy outcomes that are part of authentic assessment are important parts of a total literacy assessment program. After all, if a child can read, but does not enjoy reading and does not apply important literacy skills to everyday tasks, then some important goals of literacy instruction have not been attained.

However, since these procedures are focused on high-level reading outcomes, they cannot provide precise information about level of performance on important sub-skills in reading. If a child's overall performance on authentic literacy tasks is limited, it is frequently difficult to obtain a precise estimate of the specific component skills that are weak. The goal of the kind of assessments we will discuss here is to quantify the degree of skill a child possesses in word identification processes that have been shown to be a critical foundation for overall reading success.

Back to Top

Commonly used diagnostic measures of word reading ability

It is beyond the scope of this article to identify all the available tests of word level reading skills. Rather, I will provide examples of measurement strategies from the most commonly used measures.

Sight word reading ability

Two measures are widely used in this area, and both involve the same assessment strategy. The Word Identification sub-test from the *Woodcock*

Reading Mastery Test-Revised (Woodcock, 1987), and the reading sub-test of the *Wide Range Achievement Test-3* (Wilkinson, 1995) both require children to read lists of words that gradually increase in length and complexity while decreasing in frequency of occurrence in printed English. For example, the easiest three words on the Word Identification sub-test are *go*, *the*, and *me*, words of midlevel difficulty are *pioneer*, *inquire*, and *wealth*, and the hardest three are *epigraphist*, *facetious*, and *shillelagh*.

Neither of these widely used tests place stringent time pressure on students, so both phonetic decoding processes and sight word processes can be used to identify words on these lists. Both tests have been normed nationally, and one of their strengths is that they allow a direct assessment of children's ability to identify words solely on the basis of the word's spelling. When reading text, children also have context clues available to assist word identification, and thus text-based measures, although they may be more "authentic" in one sense, are less direct in their assessment of the kinds of word-processing skills that are particularly deficient in children with reading problems.

Phonetic reading ability

The single best measure of children's ability to apply knowledge of letter-sound correspondences in decoding words is provided by measures of non-word reading (Share & Stanovich, 1995). The Word Attack sub-test of the *Woodcock Reading Mastery Test-Revised* (Woodcock, 1987) is a good example of this kind of diagnostic test. It consists of a series of increasingly complex non-words that children are asked to "sound out as best they can." The three easiest items on the test are *ree*, *ip*, and *din*; items of moderate difficulty are *rejune*, *depine*, and *viv*; and the three hardest items are *pnir*, *ceisminadolt*, and *byrcal*.

Because the words are presented out of context, they stress the child's ability to fully analyze each word to produce the correct pronunciation. On the other hand, measures such as this do not allow an assessment of children's ability to combine phonetic decoding with use of context to arrive at a word's correct pronunciation. However, since both good and poor readers appear able to use context equally well (as long as the context is understood, Share & Stanovich, 1995), this is not an important omission on a diagnostic measure of word reading ability.

Word reading fluency

Word reading fluency measures have typically measured rate of reading connected text. One of the more widely used measures in this area is the *Gray Oral Reading Test-3rd Edition*. (Wiederholt & Bryant, 1992). This test consists of thirteen increasingly difficult passages, each followed by five comprehension questions. A measure of oral reading rate is obtained by recording the time it takes for the child to read each passage.

One potential problem with the Gray Oral Reading Test is that it does not provide a very sensitive measure of individual differences in word reading ability at very low levels of performance, such as those found in beginning first graders, or disabled readers through second grade. The passages simply begin at too high a level for children with very poor or undeveloped reading skills to display the word reading skills they actually possess.

In an effort to provide measures of fluency and accuracy in word reading skill that are simple to administer and sensitive to individual differences across a broad range of reading skills, we are currently developing simple measures of *Word Reading Efficiency* and *Non-Word Efficiency* (Torgesen & Wagner, 1997).

In both of these measures, children are shown lists of increasingly difficult words and non-words and asked to read as many words as possible in forty-five seconds. There are two forms to each test, and the child's score is simply the average number of words read in forty-five seconds. Initial evaluations indicate that these measures are very reliable (parallel form reliabilities vary between .97 and .98 for kindergarten through fifth grade). They are also highly correlated with corresponding measures from the *Woodcock Reading Master Test-Revised* at early grades (when children often run out of words they can read before they run out of time, correlations range from .89 to .94) and slightly less correlated (.86 to .88) at fourth grade, when fluency of word reading processes becomes more important to performance on the tests.

These tests have been standardized nationally and will be available from PROED publishing company in late summer 1998. If a single form of each test is administered, it will provide indices of growth in phonetic decoding and sight word reading that can be administered several times during the year and that take a very short amount of time to give.

To summarize, adequate monitoring of the growth of children's word reading abilities should include out-of-context measures of word reading ability, phonetic decoding ability (as measured by ability to read non-words), and word reading fluency. The fluency measures become more important after about second to third grade, when children have acquired a fund of word reading skills they can apply with reasonable accuracy. Measures that involve out-of-context word reading more directly assess the kinds of word reading skills that are particularly problematic for children with reading disabilities because they eliminate the contextual support on which these children rely heavily. To obtain a complete picture of overall reading development, however, it is also important to observe the way that the child integrates all sources of information about words in text, and this can only be estimated by carefully observing children as they read connected passages.

Back to Top

References

References

Click the "References" link above to hide these references.

Adams, M. J. (l990). Beginning to read: Thinking and learning about print. Cambridge, MA: MIT Press.

Allington, R. L. (l984). Content coverage and contextual reading in reading groups. Journal of Reading Behavior, 16, 85-96.

Allington, R. L., & McGill-Franzen, A. (1994). Reading and the mildly handicapped. International Encyclopedia of Education, Oxford, U. K.: Pergamon.

Brown, A. L., Palincsar, A. S., & Purcell, L. (l986). Poor readers: Teach, don't label. In U. Neisser (Ed.) The School Achievement of Minority Children: New Perspectives. (pp. 105-143) NJ: Lawrence Erlbaum Associates.

Ehri, L. C. (in press). Grapheme-phoneme knowledge is essential for learning to read words in English. In J. Metsala & L. Ehri (Eds.). Word recognition in beginning reading. Hillsdale, NJ: Lawrence Erlbaum Associates.

Fletcher, J. M., Shaywitz, S. E., Shankweiler, D. P., Katz, L., Liberman, I. Y., Stuebing, K. K., Francis, D. J., Fowler, A. E., & Shaywitz, B. A. (1994). Cognitive profiles of reading disability: Comparisons of discrepancy and low achievement definitions. Journal of Educational Psychology, 86, 623.

Foorman, B. R., Francis, D. J., Fletcher, J. M., Schatschneider, C., & Mehta, P. (1998). The role of instruction in learning to read: Preventing reading failure in at-risk children. Journal of Educational Psychology.

Francis, D. J., Shaywitz, S. E., Stuebing, K. K., Shaywitz, B. A., & Fletcher, J. M. (1996). Developmental lag versus deficit models of reading disability: A longitudinal, individual growth curves analysis. Journal of Educational Psychology, 88, 317.

Gaskins, I. W., Ehri, L. C., Cress, C., O'Hara, C., & Donnelly, K. (1996). Procedures for word learning: Making discoveries about words. The Reading Teacher, 50, 312-327.

Gough, P. B. (1996). How children learn to read and why they fail. Annals of Dyslexia, 46, 320.

Hoien, T., Lundberg, I., Stanovich, K. E., & Bjaalid, I. (1995). Components of phonological awareness. Reading and Writing: An Interdisciplinary Journal, 7, 171-188.

Hoover, W. A., & Gough, P. B. (1990). The simple view of reading. Reading and Writing, 2, 127-160.

Juel, C. (1996). What makes literacy tutoring effective? Reading Research Quarterly, 31, 268-289.

Liberman, I. Y., Shankweiler, D., & Liberman, A. M. (1989). The alphabetic principle and learning to read. In Shankweiler, D. & Liberman, I. Y. (Eds.), Phonology and reading disability: Solving the reading puzzle (pp. 133). Ann Arbor, MI: U. of Michigan Press.

Lindamood, C. H., & Lindamood, P. C. (l984). Auditory Discrimination in Depth. Austin, TX: PROED, Inc.

Lundberg, I., Frost, J., & Peterson, O. (l988). Effects of an extensive program for stimulating phonological awareness in preschool children. Reading Research Quarterly, 23, 263-284.

Mastropieri, M. A. & Scruggs, T. E. (1997). Best practices in promoting reading comprehension in students with learning disabilities: 1976-1996. Remedial and Special Education, 18, 1970213.

Nagy, W. E., Herman, P. A., & Anderson, R. C. (1985). Learning words from context. Reading Research Quarterly, 20, 233-253.

Oka, E., & Paris, S. (1986). Patterns of motivation and reading skills in underachieving children. In S. Ceci (Ed.), Handbook of cognitive, social, and neuropsychological aspects of learning disabilities (Vol. 2). Hillsdale, NJ: Erlbaum.

Rashotte, C. A., Torgesen, J. K., & Wagner, R. K. (1997). Growth in reading accuracy and fluency as a result of intensive intervention. Paper presented at the annual meetings of the Florida Branch of the International Dyslexia Association, Miami, FL, September.

Scarborough, H. S. (1998). Early identification of children at risk for reading disabilities: Phonological awareness and some other promising predictors. In Shapiro, B. K., Accardo, P. J., & Capute, A. J. (Eds.) Specific Reading Disability: A view of the spectrum. (pp. 75-120). Timonium, MD: York Press, Inc.

Share, D. L., & Stanovich, K. E. (1995). Cognitive processes in early reading development: A model of acquisition and individual differences. Issues in Education: Contributions from Educational Psychology, 1, 157.

Siegel, L. S. (1989). IQ is irrelevant to the definition of learning disabilities. Journal of Learning Disabilities, 22, 469-479.

Stanovich, K. E., & Siegel, L. S. (1994). The phenotypic performance profile of reading-disabled children: A regression-based test of the phonological-core variable-difference model. Journal of Educational Psychology, 86, 24-53.

Stanovich, K. E. (l986). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. Reading Research Quarterly, 21, 360-406.

Stanovich, K. E., Cunningham, A. E., & Cramer, B. B. (l984). Assessing phonological awareness in kindergarten children: Issues of task comparability. Journal of Experimental Child Psychology, 38, 175-190.

Torgesen, J. K. (in press). Assessment and instruction for phonemic awareness and word reading skills. In H. W. Catts and A. G. Kamhi (Eds.) Language Basis of Reading Disabilities. Needham Heights, MA: Allyn & Bacon.

Torgesen, J. K. (1998) Individual differences in response to reading intervention. Paper presented at the Pacific Coast Research Conference, LaJolla, CA, February.

Torgesen, J. K., & Burgess, S. R. (1998). Consistency of reading-related phonological processes throughout early childhood: Evidence from longitudinal-correlational and instructional studies. In J. Metsala & L. Ehri (Eds.). Word Recognition in Beginning Reading. Hillsdale, NJ: Lawrence Erlbaum Associates.

Torgesen, J. K., Burgess, S., & Rashotte, C. A. (1996). Predicting phonologically based reading disabilities: What is gained by waiting a year? Paper presented at the annual meetings of the Society for the Scientific Study of Reading, New York, April.

Torgesen, J. K., Wagner, R. K., & Rashotte, C. A. (1994). Longitudinal studies of phonological processing and reading. Journal of Learning Disabilities, 27, 276-286.

Torgesen, J. K., Wagner, R. K., & Rashotte, C. A. (1997). The prevention and remediation of severe reading disabilities: Keeping the end in mind. Scientific Studies of Reading, 1, 217-234.

Vaughn, S. & Schumm, J. S. (1996) Classroom ecologies: Classroom interactions and implications for inclusion of students with learning disabilities (pp. 107-124). In D. L. Speece & B. K. Keogh (Eds.), Research on classroom ecologies. Mahwah, NJ: Lawrence Erlbaum Associates.

Wagner, R. K., Torgesen, J. K., & Rashotte, C. A. (1994). The development of reading-related phonological processing abilities: New evidence of bidirectional causality from a latent variable longitudinal study. Developmental Psychology, 30, 73-87.

Wagner, R. K., Torgesen, J. K., Rashotte, C. A., Hecht, S. A., Barker, T. A., Burgess, S. R., Donahue, J., & Garon, T. (1997). Changing causal relations between phonological processing abilities and word-level reading as children develop from beginning to fluent readers: A five-year longitudinal study. Developmental Psychology, 33, 468-479.

Whitehurst, G. J. & Lonigan, C. J. (in press). Child development and emergent literacy. Child Development, 69.

Wilson, B. A. (1988). Instructor manual. Millbury, MA: Wilson Language Training.

Yopp, H. K. (l988). The validity and reliability of phonemic awareness tests. Reading Research Quarterly, 23, 159-177.

Reprinted with permission from the Sping/Summer 1998 issue of AMERICAN EDUCATOR, the quarterly journal of the American Federation of Teachers.

Related Topics

Advocacy
Assessment and Evaluation
Intervention and Prevention
School-Wide Efforts
Struggling Readers

"I used to walk to school with my nose buried in a book." — Coolio