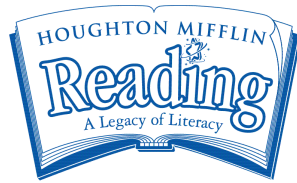


Current Research

IN READING / LANGUAGE ARTS



From Phonemic Awareness to Fluency: Effective Decoding Instruction in a Research-Based Reading Program

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Introduction

In today's society, it is absolutely critical that every child has the fullest opportunities to become an accomplished reader. Anyone unable to read and write *proficiently* faces enormous social, personal, and economic limitations in today's complex, information-flooded world. There is widespread agreement that the reading demands are greater now than at any previous time in history. To function successfully, readers must be able to construct complex understandings, make critical comparisons, draw inventive conclusions, and carefully evaluate the materials they read. In addition, to fully capitalize on the power of reading, readers must also be able to appreciate the artistry of an accomplished author. Reading involves these multiple goals and much more. This view of reading as an active, dynamic, constructive, and critical process is the view reflected in recent reviews of reading research (e.g., National Research Council, 1998; National Reading Panel, 2000) and is the view of reading reflected in this paper.

One feature that distinguishes reading from other vehicles for acquiring, evaluating, applying, and appreciating information, such as listening to a lecture or witnessing a demonstration, is that reading depends on the ability to translate print into meaning. The first vitally important step in reading is being able to decode or recognize print. The

process of being able to translate or transcode printed words into their spoken language equivalent has been variously labeled as word identification, word recognition, or decoding.

The *Literacy Dictionary* (Harris & Hodges, 1995) defines word recognition as "the process of determining the pronunciation and some degree of meaning of a word in written or printed form." (p. 283) Reading is sometimes seen as involving two major factors: word recognition that determines a word's pronunciation; and comprehension, or understanding its meaning.

English is an alphabetic language in that there is an orderly relationship between the phonemes (sounds) that are part of the oral form of language and the graphemes (letters and letter combinations such as "sh" and "th") that make up the printed form of the language. We refer to this orderly relationship in which the graphemes of written language represent the phonemes of oral language as the *alphabetic principle*. In order to understand that there is an orderly relationship, learners must be aware of sounds, or phonemes, of the spoken form of the language (phonemic awareness), and they must become very familiar with the letters of the alphabet (orthographic familiarity). Children can identify thousands of words they have never seen in print before if they learn a body of information about

the sounds the various graphemes are likely to represent. This body of information is referred to as *phonics*. The National Research Council (1998) highlighted the importance of the alphabetic principle and phonics when they observed, "Visual word recognition can flourish only when children displace the belief that print is like pictures with the insight that written words are comprised of letters that, in turn, map to speech sounds." (p. 45)

Although there is an "orderly" relationship between the sounds and graphemes of English, it is not a perfect one-to-one relationship. (If it were, "was" would rhyme with "pass" and "put" would be pronounced as "putt.") Therefore, readers who use their knowledge of phonics and other word identification skills are often uncertain they have decoded a word correctly if that word is not one they have heard before. For example, when encountering the word *cabal* for the first time in print, the reader may not know whether it is pronounced as a homophone for *cable* or whether the *a* in the first syllable is a short *a*, a long *a*, a *schwa*, or pronounced like the *a* in *father*. Moreover, the reader may not know whether the accent is on the first or the second syllable. This makes a very critical point—the application of the alphabetic principle, or more specifically, phonics, leads to a decisive decoding of a word only when that word is in the reader's mental lexicon—the store of words he knows in terms of their pronunciation; otherwise the reader must confirm his decoding attempt with an outside source such as a dictionary, a computer, or a knowledgeable person.

While failing to have a word in a reader's listening/speaking vocabulary can be a serious limitation for decoding, having a word in one's listening/speaking vocabulary can support the decoding of a word that is new in printed form in a major way. For example, the child who in mid-first grade encounters the word *water* for the first time might try pronouncing the first part of the word so that it rhymes with *hat* and then add the common word ending *er* to get /wàt-er/. However, if that child has been taught that reading should make sense, she might recognize her attempt as close to the real word *water* and consider this pronunciation a good possibility. If she had encountered the word in the sentence, "The water was too deep for swimming," checking the tentative pronunciation in the sentence context would have confirmed the decoding of the word.

There is at least one other important way in which decoding and comprehension are related. In the last example, we attempted to show how comprehension or knowledge of word meaning affects decoding. There is also, however, very clear evidence that decoding affects comprehension. Beyond the obvious case in which a young child who cannot decode is completely cut off from comprehending written text, incomplete or inadequate decoding can limit comprehension. Particularly beyond the beginning stages of learning to read, as the comprehension demands of reading materials steadily increase, it is not sufficient for decoding to be accurate; it must also be rapid and efficient. This ability to decode rapidly, accurately, and efficiently is known as *fluency*. The *Literacy Dictionary* (Harris & Hodges, 1995) more comprehensively defines fluency as "freedom from word-identification problems that might hinder comprehension in silent reading or the expression of ideas in oral reading; automaticity." (p. 85)

Well over two decades ago, Laberge and Samuels (1974) showed that a lack of decoding fluency resulted in poor comprehension. They demonstrated that comprehending text always requires active attention; however, decoding words can become so automatic that it can be accomplished with minimal active attention. Since human beings have limited attention capacity, this theoretical formulation, The Theory of Automaticity, explains that if a reader has to devote sizeable attention to decoding, insufficient attention will be available for comprehending, that is, actively constructing the meaning of text.

In the following sections, we outline the research findings and theoretical formulations that have implications for building the skills that will allow students not only to decode written texts, but also to develop the decoding efficiency that supports constructive, critical-reading comprehension. Although fluent decoding is not sufficient for high levels of reading comprehension, it is definitely a prerequisite for comprehension.

Foundations for Learning to Decode

Understanding the Functions and Value of Reading

It is critically important that children learn to decode in the early grades. There is evidence that children who do not have a successful start in learning to read are not likely to catch up with their peers and become proficient readers (Frances, Shaywitz, Stuebing, Shaywitz & Fletcher, 1996). What do children need in order to be successful in learning to read? Adams (1990), in her comprehensive review of the topic of learning to decode, concludes that “. . . the most important activity for building the knowledge and skills eventually required for reading is that of reading aloud to children.” (p. 86) She goes on to elaborate:

It is not just reading to children that makes the difference, it is enjoying the books with them and reflecting on their form and content. It is developing and supporting the children's curiosity about text and the meanings it conveys. It is encouraging the children to examine the print. And it is showing the children that we value and enjoy reading and that we hope they will too. (p. 87)

Adams estimates that preschool children who live in literacy-rich environments come to school having been read to for over 1,000 hours and that this figure may be double in some cases. She also points out, however, that preschool children from environments that provide few literacy experiences have been read to for 25 hours or less, and some not at all. She suggests that there is much that needs to be done to provide children with the fullest opportunities to learn to read:

To this end, the great value of research on prereaders may lie in the clues it gives us toward determining what the less prepared prereader needs most to learn. For these children, we have not a classroom moment to waste. The evidence strongly suggests that we must help them to develop their awareness of the phonemic composition of words. And we must also teach them the letters of the alphabet and the phonemic

significance of each. But what else? The 'reading-ready' child enters school with a substantial base of prereading skills and wealth of experience with and knowledge about the pleasures and functions of text and about literary language and styles. (p. 90)

Adams goes on to cite the importance of creating a literate classroom environment; of relating reading to work, play, and living; and of providing opportunities to see how reading provides needed information. She concludes that just as we must provide for the physical and emotional needs of young children, “We must do as much with reading. In our society, their lives depend on it.” (p. 107)

In the sections that follow we outline the importance of teaching and developing a number of more specific areas important for reading success. Those factors, however, should be considered in the broad context of ensuring that children have many opportunities to understand the functions, the benefits, and the joys of reading, and ensuring, as fully as possible, that they have many opportunities for developing confidence in their ability to learn to read.

Language Development

There is a clear and obvious link between the various aspects of language development. Listening, speaking, reading, and writing are all forms of language development, and as such are highly interrelated. Listening and speaking skills, oral forms of language, develop earlier and form a foundation for building reading and writing skills, written forms of language development. The word *home*, for example, raises a host of meanings, associations, and memories regardless of whether it is read or heard. As the National Research Council (1998) points out, “Many basic cognitive processes are shared during reading and listening. Syntactic and inferential processes as well as background and word knowledge play a role in both.” (p. 64) That council goes on to cite studies that show that the correlations between listening comprehension and reading comprehension tend to be low in the early grades, but they rise through about sixth grade. The relationship between language development and reading achievement is lower in the early grades for several reasons. First, achievement in reading in the early grades is highly dependent on decoding skills, which are less directly related to language development. Second, most beginning reading

materials minimize language and conceptual challenges in order to allow children to focus their energies and attention on word identification. Even beginning reading instruction, however, should include language expansion activities so that children build the language skills and background information they will need to read more complex reading materials as they progress through the grades.

Concepts of Print

The term *concepts of print* refers to children's knowledge of the conventions of printed English language, for example, that we read English from left to right and top to bottom. The term also describes familiarity with and the ability to use terms like *letter*, *word*, and *sentence* as applied to print. It also describes the insight that there is a correspondence between the number of printed words in a text and the number of spoken words that are read, and the ability to apply that insight while reading, often referred to as the ability to "track print." As the Learning First Alliance document (1998) indicates, "Children need to know that stories and other texts are written from left to right, and that there is a one-to-one correspondence between the words on a page and the words a reader says." (p. 11)

Letter Recognition

Letters are the building blocks of print. It seems only reasonable that learning to read depends completely on the ability to accurately and rapidly recognize the letters of the alphabet and to discriminate each letter from the others, sometimes referred to as orthographic familiarity. Indeed, there is massive research evidence to support this conclusion (Andersen, et al., 1985; Adams, 1990; Ehri, 1991; National Research Council, 1998). For example, Adams (1990) concludes, "There exists a wealth of evidence that the speed and accuracy with which young readers can recognize individual letters is a critical determinant of their reading proficiency and future growth." (p. 112)

Phonemic Awareness

Concepts of print and letter recognition deal with the visual dimensions of language; phonemic awareness deals with the oral dimensions of language. As explained in other parts of this

paper, English is an alphabetic language, which means that a small number of graphemes represent the sounds of the oral forms of the language. In English there are approximately 42 to 44 different speech sounds. (Linguistic experts disagree on the exact number, and the number of different sounds varies from one English dialect to another.) The terms *phonological* and *phonemic awareness* refer to the insight that spoken language consists of identifiable units; for example, that utterances are composed of spoken words, that spoken words consist of one or more syllables, that spoken words and syllables are composed of sounds.

Measures of phonemic awareness are among the best, if not the best, predictors of success in learning to read (Adams, 1990; National Research Council, 1998; Learning First Alliance, 1998; National Reading Panel, 2000). In the early stages of learning to read, children rely on "sounding out" words—associating printed letters with the sounds of oral language and blending these sounds together. If children have not developed the insight that oral words are composed of a limited number of units called sounds, they will not be able to use this fundamental approach to word identification. Being able to think about the sounds in spoken words (phonemic segmentation) is critically and directly related to spelling ability, and being able to blend sounds together to form oral words (phonemic blending) is critically important and directly related to acquiring reading skills. While the term phonological awareness refers to a variety of sound units in spoken language such as spoken word, syllable, onsets, and rimes, the critical units for reading appear to be phonemes, and the critical phonemic awareness skills appear to be blending and segmenting phonemes (National Reading Panel, 2000). (See Pikulski & Templeton, 1998, for a fuller discussion of phonemic awareness.)

Identifying Words

Researchers have demonstrated that learning to read words is not a matter of memorizing the visual appearance of each written word. Such a process would place overwhelming demands on memory. Rather, learners must make connections between the letters in the visual array of written words and the sounds that correspond to those letters. Beginning readers, therefore, need to pronounce a word as they look at the spelling of the word, thinking about the connections between the letters and the sounds.

Beginning readers who learn to examine written words this way, often referred to as *sequential decoding*, are much more likely to remember individual words and to recognize these words when they see them again in print. With repeated exposure to words, this type of examination leads to the automatic recognition of the words, without conscious examination or attention to individual letter-sound associations. When this automatic recognition occurs, the reader has immediate access to the meaning of the word, its grammatical role in a sentence, and its pronunciation. The rapid and fluent recognition of words during reading ensures that the reader is able to think about and reflect upon the meaning of what is being read, as opposed to having to allocate the mental resources to decoding many words on the page. However, to achieve fluent, automatic recognition of words, developing readers must initially carefully attend to and process the letters in printed words and the sounds associated with those letters.

Phases of Development in Learning to Decode Words

A number of researchers have investigated the development of decoding in readers. Different developmental phases have been identified, distinguished by the different types and amounts of alphabetic information that readers use to decode and remember written words. *Alphabetic information* refers to the ways in which individual letters and letter combinations symbolize sounds; combinations of letters include simple digraphs and clusters such as *ch*, *th*, *bl*, and *str*; spelling patterns (rimes) such as *-at* *-est* *-ump*, and *-ike*; and meaningful units, or *morphemes*, such as the affixes *pre-*, *dis-*, *-tion*, and the Latin word root *-spect-* (*inspect*).

The work of Linnea Ehri (for example, 1985, 1991, 1995) has been particularly informative in exploring the developmental process of learning to read words. Ehri has identified four developmental phases: *pre-alphabetic*, *partial alphabetic*, *full alphabetic*, and *consolidated alphabetic*.

The *pre-alphabetic phase* characterizes how emergent readers “read” words: They do not make associations between letters and sounds because they have not yet gained insight into the alphabetic principle. Rather, they associate particular visual characteristics of words, and the context in which they occur, with a meaning. For example they may “read” the word *produce* in a supermarket as “fruit”

or “veggies;” they use context and meaning to generate a response to print, but their response lacks accuracy because they cannot yet make use of the alphabetic principle.

In the *partial alphabetic phase* children attend to at least some salient sounds within words; they make connections between some of the letters and sounds, usually at the beginning and endings of words. They are not yet systematically processing the letters in a word and aren’t consciously attending to vowels. A child may learn to read the word *sun*, for example, by noticing the letters *s* and *n* and realizing that these letters correspond to the sounds she hears when she says the word. In this type of *partial* connection, *sn* stays in a child’s memory and may help her to identify *sun* when she next sees it; however, since only partial information is used, words like *sign* and *soon* may also be misidentified as *sun*. Children at this stage need instruction and experiences that will help them move to the full alphabetic phase.

In the *full alphabetic phase* children can and do attend consciously to all of the sounds within a word. Because of this, they are able to form complete connections between the letters in the written word and the sounds in the spoken word. Most importantly, this ability allows them to 1) *decode* words they have not seen before because they now know the sounds that letters are most likely to represent and can reliably make use of those letter/sound associations, and 2) learn and remember sight words much more easily and effectively.

Through careful attention to print in sequential decoding, children begin to notice that the same *patterns* of letters, such as *-at* and *-ike* occur in many words. Instruction that focuses on these patterns and the experience of reading these patterns over and over in words leads to the ability to process or “chunk” the letters as a single unit rather than as three separate letters. When readers are able to do this, they are in the *consolidated alphabetic phase*. A word such as *shake*, for example, is now read as two units, *sh* and *ake*, whereas at the full alphabetic level it would be read as three parts, *sh* + *a* + *k*. This ability to read letter patterns as units allows the more rapid identification and processing of words during reading, making reading words a much more *automatic* process. This building of fluency, in turn, allows the reader to spend more time *thinking* about what is being read. Over time, readers’ sight vocabularies include many *polysyllabic* words.

Syllable patterns come to play a role in word recognition (Taft, 1991) as well as meaning or *morphemic* patterns (Derwing, Smith, & Wiebe, 1995; Fowler & Liberman, 1995; Templeton, 1992). More advanced readers, therefore, apply their knowledge of spelling *and* meaning patterns in recognizing words.

A number of researchers have emphasized the role of *spelling* in the development of word knowledge (Ehri, 1986, 1997; Frith, 1985; Henderson, 1990; Templeton & Bear, 1992; Treiman, 1993). They have demonstrated that reading words and spelling words are not separate, distinct processes but rather processes that draw upon the same types of underlying word knowledge. The type of alphabetic information that readers use to *read* words is the same type of information they use to *spell* words. For example, a child in the *partial alphabetic* phase whose mental representation for the written word *sun* is *sn* is also likely to spell the word as *sn*. In fact, instruction in spelling is probably the best way for partial alphabetic readers to become fully phonemically aware. At this phase and at the *full alphabetic* phase, spelling can be a "pacemaker" for reading: In the process of spelling or writing, students extend their knowledge of the alphabetic system, and this knowledge informs the strategies they use to decode words during reading (Frith, 1985; Morris & Perney, 1984).

Beginning in first grade, when most children have developed *full alphabetic* knowledge, spelling instruction should be coordinated with reading instruction, as well-organized, systematic lessons in spelling are critical. Later, beginning in the *consolidated alphabetic* phase, reading becomes the "pacemaker" for spelling as students encounter repeated examples of the spelling patterns in words they read. After learners have experienced these words and patterns in print a number of times, they are then able to learn their conventional spellings.

Later still, through the examination of words such as *sign/signature* and *crumb/crumble*, students will learn how *meaning* is a clue to remembering the spelling of so many words; e.g., although the pronunciation of the letters in *sign* and *crumb* changes depending on the word in which they occur, their spelling does not change because it represents and preserves the meaning relationship that these words share (Templeton & Morris, 1999, 2000).

How Words Can Be Identified

Readers have several possibilities available for identifying written words:

1. Sequential decoding
2. Use of spelling patterns or analogy
3. Use of morphemic elements
4. Use of context clues
5. Automatic recognition
6. Strategically using combinations of the above

Beginning readers who are drawing upon full-alphabetic knowledge, through their knowledge of phonics and their ability to blend phonemes, are able to decode words sequentially, letter-by-letter, identifying the sound associated with each letter and then blending the sounds together. While this is a relatively time and energy-consuming way to identify words, it is reliable, and this careful processing of print allows the beginning reader to store letter patterns and eventually whole words that can be used to more efficiently and effectively decode words. As a result, beginning readers who carefully process print can move into the consolidated alphabetic stage of development and recognize common letter combinations or spelling patterns (*at, og, etc.*) as units.

Readers can also identify a word by analogy: If a part of the word looks like another word that they know, they can use that information to determine the identity of the unknown word. The unfamiliar word *snake* would be recognized as containing the pattern *-ake*, which also occurs in *cake*, a word that is known.

As students progress through the grades, they also increasingly use morphology to decode words (Scott & Nagy, 1994; Smith, 1998; Sternberg & Powell, 1983; Wysocki & Jenkins, 1987). Morphemes, the smallest units of *meaning* in a language, can be individual words that have meaning on their own, such as *desk* and *run*; they can be word parts that change and extend the meaning of words to which they are added, such as prefixes (*un-*, *re-*, *dis-*) or suffixes (*-ful* and *-ity*); and they can be Greek or Latin word roots that usually do not stand alone as words but are the meaning "anchor" to which affixes attach, such as *chron* ("time," as in *chronology*) and *tract* ("draw or pull," as in *tractor* and *attract*). Like the use of spelling patterns and word patterns, the use of morphemes to identify words is efficient

because the reader is responding to units larger than a single letter.

Beginning readers can sometimes use context to help identify an unknown word. Context includes the surrounding text as well as picture clues. However, there is substantial research showing that younger and poorer readers rely more on context than do skillful readers (Stanovich, 1980; Adams, 1990). If beginning readers rely heavily on context as a word identification strategy, they experience considerable difficulty in developing their sight-word vocabularies. Even when they correctly identify a word using context, they will most likely not know the word the next time they encounter it in print—they have no way of holding onto it in memory because they did not examine the connections between letters and sounds within the words. As Adams puts it, “To the extent that children use context to avoid fully processing and, thereby, learning about the spelling of words, it may in the long run slow their reading growth.” (p. 178)

On the other hand, contextual analysis is useful in that it can provide confirmation of an initial hypothesis about a word’s identity. *If* readers understand how to decode a word using phonics, their knowledge of spelling patterns, syllable patterns, and/or morphemic elements, *then* context can provide a useful “check” or confirmation of the word. This check occurs, however, *after* the word has at least been tentatively identified using more reliable, effective strategies such as letter-by-letter sounding out of the word or use of word parts.

The best means of identifying words during reading is to retrieve them from memory, without conscious effort, as sight words. A primary goal for beginning reading, therefore, is to assist children in developing sight vocabularies. It is critical that the important goal of developing a large fund of sight words not be confused with the outdated, discredited *sight approach* to teaching words in which beginning readers were instructed to learn words as “wholes” without reference to letter-sound associations and spelling patterns. Instead, research shows that instruction can best be done through 1) helping children to examine the spellings of words, thinking about how the spellings symbolize sounds, and then blending the sounds, and 2) engaging them in reading texts in which they have opportunities to reinforce their developing sight vocabulary and apply word recognition strategies to unfamiliar words, which become part of their sight vocabularies.

Developing readers need to be taught to be flexible and strategic in their approach to identifying words. In the initial stages of learning to read, they will need to rely on sequential decoding, paying careful attention to the orderly relationship that exists between letters and sounds and monitoring their decoding attempts to ensure that what they are reading makes sense. As their experience with printed words and word parts grows, they will recognize clusters of letters and whole words, which will move them toward greater fluency; however, even fluent readers will sometimes need to revert to sequential decoding in order to decode an unfamiliar word.

Characteristics of Effective Phonics Instruction

Children benefit from organized instruction that centers on sounds, letters, the relationships between sounds and letters, and the application of this knowledge to reading words and interesting texts. Effective phonics instruction has the following key characteristics:

Early

The process of learning to read begins early in the preschool years with the development of oral language and an understanding of the functions of print. In kindergarten, children should be taught to accurately identify the letters of the alphabet. Children’s alphabet knowledge is enhanced when they are engaged in activities where they learn to identify and name both upper case and lower case letters through games, songs, and activities that encourage them to practice writing the letters they are learning.

In addition to alphabet knowledge, children in kindergarten need to develop their phonemic awareness, progressing from identifying rhyming words and creating rhymes to learning that sentences are made up of separate words. They then learn that words are composed of syllables and of sounds that can be separated from each other, and manipulated and used in other words.

As children acquire knowledge of the alphabet and begin to hear and play with the sounds in words, they are ready for early instruction in associating letters and sounds, phonics. The benefit of phonics instruc-

tion in kindergarten is documented in the recent report of the National Reading Panel (2000): “The ability to read and spell was enhanced in kindergartners who received systematic phonics instruction.” (p. 9) The report also states: “Although conventional wisdom has suggested that kindergarten students might not be ready for phonics, this assumption was not supported by the data. The effects of systematic early phonics instruction were significant and substantial in kindergarten and first grade, indicating that systematic phonics programs should be implemented at those age and grade levels.” (p. 10)

Systematic

The recent National Reading Panel Report contrasted systematic and incidental phonics approaches in this way, “The hallmark of a systematic phonics approach or program is that a sequential set of phonics elements is delineated and these elements are taught along a dimension of explicitness depending on the type of phonics methods employed. Conversely, with incidental phonics instruction the teacher does not follow a planned sequence of phonics elements but highlights particular elements opportunistically when they appear in text.” (p. 8)

As a result of their rigorous analysis of the available research, the panel concluded: “The meta-analysis indicated that systematic phonics instruction enhances children’s success in learning to read and that systematic phonics instruction is significantly more effective than instruction that teaches little or no phonics.” (p. 9)

Thus, systematic phonics instruction refers to instruction that follows a carefully planned sequence; however, there is no one “correct” sequence for phonics instruction. Rather, there are logical principles that should guide a scope and sequence for teaching phonics. Those principles involve:

- a. Moving from easier to more difficult instructional activities. For example, introducing the sound for letters like *m* and *s* early because their sounds can be elongated and emphasized (it is easy to say *mmm*) as contrasted with the sounds for *t* or *b*, which cannot be held onto.
- b. Teaching in a sequence in which most useful information is taught early and less useful information is taught later. For example, teaching the sounds for *t* and *m* before the

sounds for *j* and *y* because many more words contain *t* and *m*.

- c. Introducing consonants and vowels in a sequence that permits children to read words.
- d. Introducing consonant digraphs and blends/ clusters after single consonants are taught.
- e. Providing blending instruction with words that contain the sound-letter relationships that the children are learning.
- f. Providing practice opportunities that include new sound-letter relationships as well as cumulative review of previously taught relationships. It is particularly important that children have opportunities to read texts that contain words that use recently taught phonics elements—often referred to as *decodable* texts.

Direct-Explicit

Phonics instruction is usually categorized as explicit or implicit. The National Reading Panel (2000) analysis indicated that “explicit, systematic phonics instruction is a valuable and essential part of a successful classroom reading program.” (p. 10) In *explicit phonics instruction*, the sounds associated with the letters are identified in isolation and then blended together to form words. The teacher directly tells students the sound represented by an individual letter. For example, “The letter *s* makes the sound /sss/.” When children have learned several letter/sound correspondences, including one or two vowels, they can read words by blending the sounds for the letters together. For example, students who have learned the sound-letter correspondences /s/ /a/ and /t/ can blend them to read *sat*.

On the other hand, the National Reading Panel defined implicit (also called analytic phonics) as: “teaching students to analyze letter-sound relations in previously learned words to avoid pronouncing sounds in isolation.” (p. 8)

The issue of whether phonics should be taught explicitly or implicitly has been among the most hotly debated topics in the field of reading. Critics of explicit phonics charge that many consonant sounds cannot be produced without distorting them by adding a vowel sound to make them pronounceable—e.g., in an attempt to blend the phonemes in *cup*, a child could add a schwa sound, which would result in something like

/k/ /ə/ /ù/ /p/ /ə/ and go unrecognized as *cup* by the novice reader. On the other hand, the 1985 Commission on Reading (Anderson, et al. 1985) points out that implicit phonics approaches, where sounds are never isolated, where instead children are told statements like "m has the sound heard at the beginning of mother," places very high phonemic segmentation demands on beginning readers, many of whom have difficulty with this skill. What can be concluded from research studies and reviews?

More than three decades ago Jeanne Chall (1967), based on her research review, concluded that explicit phonics is more effective and affirmed this position in her 1983 publication. The 1985 Commission on Reading (Anderson, et al. 1985), though cautious, arrived at the following conclusion, "In the judgment of the Commission, isolating sounds associated with most letters and teaching children to blend the sounds of the letters together to try to identify words are useful, constructive strategies. These are the strategies of explicit phonics." (p. 42) The Commission goes on to urge flexibility in phonics instruction. After examining all the reliable available evidence, the National Reading Panel (2000) concluded that explicit (synthetic) phonics has a positive and significant effect for low-socioeconomic-status children and for children who have difficulty learning to read. Thus, the major research reviews of beginning reading instruction support teaching phonics explicitly.

Efficient

Several important principles reflect the importance of teaching phonics efficiently. First, it is important to avoid teaching a large number of useless rules or generalizations. Many phonics rules can be learned by students, but memorizing rules does not facilitate children's reading growth. For example, it is probably not efficient to teach many generalities governing the pronunciation of vowels.

Second, it is equally important to avoid teaching phonics via "rote memorization," through drill and practice. Relatedly, it is best to avoid teaching many letter-sound relationships before providing real reading practice. As was mentioned earlier, letter-sound relationships that have high usage should be taught so that the children can read words as soon as possible, and so that reading in connected text can be used to practice and review phonics knowledge.

The National Reading Panel draws an unequivocal conclusion here: "Programs that focus too much on the teaching of letter-sound relations and not enough on putting them to use are unlikely to be effective in implementing systematic phonics instruction. Educators must keep the end in mind and ensure that children understand the purpose of learning letter sounds and are able to apply their skills accurately and fluently in their daily reading and writing activities." (p. 10)

Flexible and Strategic

Finally, an efficient phonics program adjusts the form and intensity of instruction to the needs of children who are learning to read; different children seem to need varying amounts of phonics instruction and practice. Consequently, frequent diagnostic checks should be part of instruction. While some students will quickly master decoding skills, others will require reteaching and appropriate forms of added practice.

In an efficient decoding program, teachers will *model* the various decoding processes for students, and demonstrate how these processes can be applied flexibly and strategically during the reading of real texts so that students will understand how to apply the decoding skills they have and to strategically use multiple sources of information to *confirm* a meaning suggested by an analysis of an unfamiliar word. Starting in first grade, teachers may begin to use think-alouds to demonstrate for students how skilled readers approach new words. To be effective, these think-aloud models should demonstrate how the reader identifies familiar chunks or word parts within the word and then applies a "sounding out" strategy, reading the sounds and parts from left to right. Once the word is read, the reader tries to connect the pronunciation with a known word. Teachers should also model *flexibility*, so that students' understand that attempts to apply their decoding strategy may not always be successful and that decoding some words may require multiple attempts. For example, a teacher can model a flexible strategy with a word like *habit*. Because this word's spelling follows a common pattern in which the vowel in the first syllable is quite often long, she pronounces it as /hābit/. This pronunciation, of course, does not sound like a word the students know. The teacher then tries a short vowel pronunciation for the first vowel, /hăb-it/. The students recognize this pronunciation, and the

teacher then reads the whole sentence in which the word occurs, and confirms—with the students—that this is indeed the correct word.

Extended

Decoding skills strategies should be flexible and grow as readers grow. In the middle and upper elementary grades, the strategy includes decoding multisyllabic words through dividing words into syllables and through the identification of base words and word roots, and prefixes and suffixes.

Students need instruction and guidance in decoding even as they move beyond the initial stages of learning to read. As they encounter longer words, one of their greatest challenges is to divide those words into pronounceable syllables. While mature readers, because of much practice in decoding, develop "a sense" of where to divide words they have not seen before (Adams, 1990), developing readers may need to be taught to flexibly and strategically use a small number of useful generalizations for dividing words and pronouncing syllables. For example, a third grader encountering the word *suddenly* in print for the first time might have difficulty with the beginning part of the word but recognize *ly* as a common ending; knowing that the beginning part of the word has the pattern of a vowel followed by two consonants and another vowel (referred to as a VCCV pattern) and that words with this pattern often divide between the two consonants, can serve as a useful next step to decoding the word; now there are two short syllables to read, *sud* and *den* which are easily pronounced by analogy, recognition of word parts, or sequential decoding. Notice, however, that the vowel sound in the second syllable needs to be adjusted to get at the real word *suddenly*. This also illustrates that meaning, deciding the tentative pronunciation arrived at through decoding, and flexibly adjusting the pronunciation, is a very important aspect of decoding.

Much of students' learning of sight words and of strategies for decoding longer and often more structurally complex words is related to their vocabulary growth. Students must read widely; and if, in addition, they understand how word parts combine to create words, they have at their disposal one of the most powerful strategies for not only decoding new words in reading but also for increasing their vocabularies.

Conclusions

Proficient reading is essential for success in today's world, and efficient decoding skills are essential, though not sufficient, for proficient reading. Students who fail to develop fluent decoding will not be proficient readers nor are they likely to succeed in school. Recent research, particularly major research syntheses (Adams, 1990; Learning First Alliance, 1998; National Reading Panel, 2000; Snow, et al., 1998) provides informed guidance about instructional practices that lead to the development of efficient decoding skills. Decoding skills need to build on a foundation of oral language and phonemic and orthographic awareness in children who understand the functions and value of reading. Early phonics instruction develops an understanding of the alphabetic principle and helps young children make use of the orderly relationship that exists between letters and sounds. Effective phonics instruction leads developing readers to systematically process print through sequential decoding and, through that processing, to develop the ability to rapidly recognize common groups of letters and whole words. Wide reading extends the rapid recognition of word parts and words. This fluency allows the maturing reader to focus attention on actively constructing and responding to the meaning of print.

Well over a decade ago, Keith Stanovich (1986; also see Cunningham & Stanovich, 1998) published what has become a classic article in the field of reading. He made the all-important point that students who receive excellent decoding instruction are off to a fast start in reading and are motivated to read widely. That wide reading, in turn, further enhances the development of reading skills and achievement of those students. Conversely, students with poor decoding skills are motivated to avoid reading and their failure to read limits the development of their reading skills and achievement. As a consequence, the gap between achieving and non-achieving readers widens as they progress through school. In other words, "The rich get richer and the poor get poorer." Thus decoding fluency is of monumental importance in that it unlocks the world of reading.

References

- Adams, M. J. (1990). Beginning to Read: Thinking and Learning About Print. Cambridge, MA: MIT Press.
- Anderson, R. C., Hiebert, E. H., Scott, J. A., & Wilkinson, I. A. G. (1985). Becoming a Nation of Readers. The National Academy of Education & the Center for the Study of Reading.
- Bear, D., Invernizzi, M., Templeton, S., & Johnson, F. (2000). Words Their Way: Word Study for Phonics, Spelling and Vocabulary Development (2nd ed.). Englewood Cliffs, NJ: Merrill/Prentice-Hall.
- Cunningham, A. E., & Stanovich, K. E. (1998). What Reading Does For The Mind. American Educator, 22, 8–17.
- Ehri, L. (1991). Development of the ability to read words. In R. Barr, M. Kamil, P. Mosenthal, & P. Pearson, eds. Handbook of Reading Research. (Vol II, pp. 383–417). New York: Longman.
- Ehri, L. (1997). Learning to read and learning to spell are one and the same, almost. In C. Perfetti, L. Rieben, & M. Fayol, eds. Learning to spell: Research, theory, and practice across languages (pp. 237–269). Mahwah, NJ: Lawrence Erlbaum.
- Ehri, L., & Wilce, L. (1985). Movement into reading: Is the first stage of printed word learning visual or phonetic? Reading Research Quarterly, 20, 163–179.
- Ehri, L., & Wilce, L. (1986). The influence of spellings on speech: Are alveolar flaps /d/ or /t/? In D. Yaden & S. Templeton, eds. Metalinguistic awareness and beginning literacy (pp. 101–114). Portsmouth, NH.
- Foorman, B. R., Francis, D. J., Shaywitz, S. E., Shaywitz, B. A., & Fletcher, J. M. (1999). The case for early remediation in California. State Board of Education. Read All About It! Readings to inform the profession. Sacramento, CA: Sacramento County Office of Education. pp. 103–115.
- Frances, D. J., Shaywitz, S. E., Stuebing, K. K., Shaywitz, B. A., & Fletcher, J. M. (1996). Developmental lag versus deficit models for reading disability: An individual growth curves analyses. Journal of Education Psychology, 88, 3–17.
- Harris, T. L., & Hodges, R. E. (1995). The literacy dictionary: The vocabulary of reading and writing. Newark, DE, The International Reading Association.
- Juel, C. (1999). Learning to read and write: A longitudinal study of 54 children from first through fourth grade. In California Reading Initiative. Read all about it: Readings to inform the profession. Sacramento, CA: Sacramento County Office of Education.
- LaBerge, D., & Samuels, S. J. (1974). Toward a theory of automatic information processing in reading. Cognitive Psychology, 6, 293–323.
- Learning First Alliance (1998). Every Child Reading: An Action Plan. Learning First Alliance.
- National Reading Council (1998). Preventing Reading Difficulties in Young Children. National Academy Press.
- National Reading Panel (2000). Report of the National Reading Panel, Teaching Children to Read. National Institutes of Health Pub. No. 00-4754.
- Smith, M. L. (1998). Sense and sensitivity: An investigation into fifth-grade children's knowledge of English derivational morphology and its relationship to vocabulary and reading ability. Dissertation Abstracts International Section A: Humanities and Social Sciences. Vol 59 (4-A): 1111.
- Stanovich, K. E. (1980). Toward an interactive-compensatory model of individual differences in the development of reading fluency. Reading Research Quarterly, 16, 32–71.
- Stanovich, K. E. (1986). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. Reading Research Quarterly, 21, 360–406.
- Templeton, S. (1992). Theory, nature, and pedagogy of higher order orthographic development in older students. In S. Templeton and D. R. Bear, eds. Development of orthographic knowledge and the foundation of literacy: A Memorial Festschrift for Edmund Henderson (pp. 253–277). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Templeton, S., & Morris, D. (2000). Spelling. In M. Kamil, P. Mosenthal, P.D. Pearson, & R. Barr, eds. Handbook of reading research: Volume 3 (pp. 525–543). Mahwah, NJ: Lawrence Erlbaum Associates.

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