What Every Teacher Should Know about Phonological Awareness

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Phonological awareness is one of the most important education concepts of this decade. Teachers are talking about it, parents are trying to understand it, and publishers of early reading materials are trying to include it. Yet, it is a concept that is easily misunderstood. Some confuse it with phonics; others consider it a part of general print awareness. It is neither of these things.

Likewise, there are questions about how to teach phonological awareness to children. Unless we thoroughly understand the concept and its role in reading development, we may easily teach it in ways that produce no real benefit. This paper summarizes in question and answer form what is known about the nature of phonological awareness, why it is important in reading growth, why children differ from one another in their ability to acquire it, and how we may most effectively incorporate it into reading instruction.

You'll find answers to these questions inside...

You'll also find...

What is phonological awareness?

To understand phonological awareness, we must first know what a phoneme is. A phoneme is the smallest unit of sound in our language that makes a difference in a word's meaning. For example, the word *cat* has three phonemes, /k/- /a/- /t/. By changing the first phoneme, we can produce the word *bat*. Changing the second phoneme creates the word *cot*, and we can create the word *cab* by altering the final phoneme. Words in English (in fact, in all languages) are composed of strings of phonemes. This is fortunate, because it allows us to create all the words we will ever need by using various combinations of just 44 different speech sounds!

Speech scientists have discovered that the human brain is specifically adapted for processing many different kinds of linguistic information, and one part of our biological endowment allows us to process the complex phonological information in speech without actually being aware of the individual phonemes themselves. This is one of the human abilities that makes acquiring speech a natural process, so that almost everyone in the world learns to *speak* a language with very little direct instruction. However, because phonemes are represented by letters in print, learning to *read* requires that children become *consciously* aware of phonemes as individual segments in words. In fact, **phonological awareness is most commonly defined as one's sensitivity to, or explicit awareness of, the phonological structure of words in one's language. In short, it involves the ability to notice, think about, or manipulate the individual sounds in words.**

One of the early signs of emerging sensitivity to the phonological structure of words is the ability to play rhyming games. In order to tell whether two words rhyme, the child must attend to the sounds in the words rather than to the meaning of the words. In addition, the child must focus attention on only one part of a word rather than on the way it sounds as a whole. As children grow in awareness of the phonemes in words, they become able to judge whether words have the same first or last sounds; with further development, they become able to isolate and pronounce the first, last, or middle sounds in words. At its highest levels of development, awareness of individual phonemes in words is evidenced by the ability to separately pronounce the sounds in even multi-syllable words or to tell exactly how two words like *task* and *tacks* are different. (The order of the last two phonemes is reversed.)

Acquiring phonological awareness involves two things: learning that words can be divided into segments of sound smaller than a syllable, and learning about individual phonemes themselves. As children acquire more and more conscious knowledge of the distinctive features of phonemes (how they sound when they occur in words, or how they feel when they are pronounced), they become more adept at noticing their identity and order when they occur in words. For example, while children in the first semester of first grade might be able to isolate and identify the first or last sound of a word like *man*, by the end of first grade, most children can easily, and relatively automatically, segment all the sounds in a more complex word like *clap*.

Why is phonological awareness important in learning to read?

Phonological awareness is important because it strongly supports learning how the words in our language are represented in print. When children learn to read, they must acquire two different kinds of skills. They must learn how to identify printed words, and they must learn how to comprehend written material. Their major challenge when they first enter school is to learn to accurately identify printed words, and this brings them face to face with the alphabetic principle. English is an alphabetic language, meaning that words are represented in print roughly at the level of phonemes. For example, the word *cat* has three phonemes, and three letters are used to represent them; the word *which* also has three phonemes, but five letters are used to represent them.

In our language, the alphabetic principle presents two important learning challenges to children. First, individual phonemes are not readily apparent as individual segments in normal speech. When we say the word *dog*, for example, the phonemes overlap with one another (they are co-articulated), so that we hear a single burst of sound rather than three individual segments. Co-articulating the phonemes in words (e.g., starting to pronounce the second phoneme, /r/, in the word *frost* while we are still saying the first phoneme, /f/) makes speech fluent, but it also makes it hard for many children to become aware of phonemes as individual segments of sound within words.

The second challenge presented by the alphabetic principle in our language is that there is not always a regular one-to-one correspondence between letters and phonemes. For example, some phonemes are represented by more than one letter (e.g., ch, sh, wh, ai, oi). In addition, sometimes the phoneme represented by a letter changes, depending on other letters in the word (*not* vs. *note*, *fit* vs. *fight*, *not* vs. *notion*), or pronunciation of parts of some words may not follow any regular letter-phoneme correspondence patterns, such as in *yacht* or *choir*.

If understanding and using the alphabetic principle in reading words presents such learning challenges for children, the obvious question, and one repeatedly asked over the last century, is whether it is really necessary for children to understand the principle and master its use in order to become good readers. On the basis of research on reading, reading development, and reading instruction conducted over the past twenty years, we now know the answer to this question is very strongly in the affirmative (Beck & Juel, 1995). Children who quickly come to understand the relationships between letters and phonemes, and who learn to use this information as an aid to identifying words in print, almost invariably become better readers than children who have difficulty acquiring these skills (Share & Stanovich, 1995).

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There are at least three ways that phonological awareness is important in learning beginning word reading skills.

- It helps children understand the alphabetic principle. Without at least a beginning level of phonological awareness, children have no way of understanding how the words from their oral language are represented in print. Unless they understand that words have sound segments at the level of the phoneme, they cannot take advantage of an alphabetic script (Liberman, Shankweiler, & Liberman, 1989). They will also not be able to understand the rationale for learning individual letter sounds, and the common strategy of "sounding out" words in beginning reading will not make sense to them.

- It helps children notice the regular ways letters represent sounds in words. If children can notice all four phonemes in the spoken word *flat*, it helps them understand the way the letters in the written word correspond to the sounds. This ability to notice the match between the letters and sounds in words has two potential benefits to children learning to read. First, it reinforces knowledge of individual letter-sound correspondences, and second, it helps in forming mental representations of words so they can be accurately recognized when they are encountered in print again. Research has shown that the associations children form between the letters and sounds in words creates the kind of "sight-word" representations that are the basis of fluent reading (Ehri, in press).

- It makes it possible to generate possibilities for words in context that are only partially "sounded out." For example, consider a first-grade child who encounters a sentence such as "John's father put his bicycle in the car," and cannot recognize the fifth word. A relatively early level of phonological awareness supports the ability to search one's mental dictionary for words that begin with similar sounds. Thus, if the child knows the sound represented by the letter b, he/she can mentally search for words that begin with that sound and fit the context. As children acquire more knowledge of phonics and can sound out more letters in words, their search for words with similar phonemes in them can proceed much more quickly and accurately.

As is clear from this analysis, phonemic awareness has its primary impact on reading growth through its effect on children's ability to phonetically decode words in text. Although phonetic decoding skills should never be considered the end goal of reading, research shows that, for most children, acquiring these skills is a critical step toward effective reading.

To illustrate the impact that deficient phonological awareness can have on the growth of reading skills, the graphs on the next page compare the growth of word-reading ability in two groups of children who began first grade with different levels of phonological awareness. The numbers at the

right of the graphs represent the average grade-level score at the end of fifth grade of children who scored above and below the 20th percentile on phonological awareness tests at the beginning of first grade. In other words, one of the groups of children fell in the bottom 20% on measures of phonological awareness (in a sample of 200 children), and the other group consisted of everyone scoring above the 20th percentile (Torgesen, Wagner, & Rashotte, 1994). All children had general verbal ability in the normal range.

From the first graph, we can see that children with weak phonological awareness ended up about two grade levels below their peers in sight-word reading ability. The second graph shows that their phonetic reading skills were more than three grade levels below those of their peers. On a measure of reading comprehension, the children with weak phonological awareness obtained a grade score of 3.9, which was three years behind the score of 6.9 obtained by their peers.

Of course, phonological awareness is not the only knowledge or skill required to learn to read. Longitudinal research has shown us that phonological awareness is necessary, but not sufficient, for becoming a good reader. Other phonological abilities may also affect children's ability to acquire phonetic decoding ability and sight-word fluency, and a good vocabulary, general knowledge about the world, good thinking skills, and an interest in reading are clearly important in the development of reading comprehension.

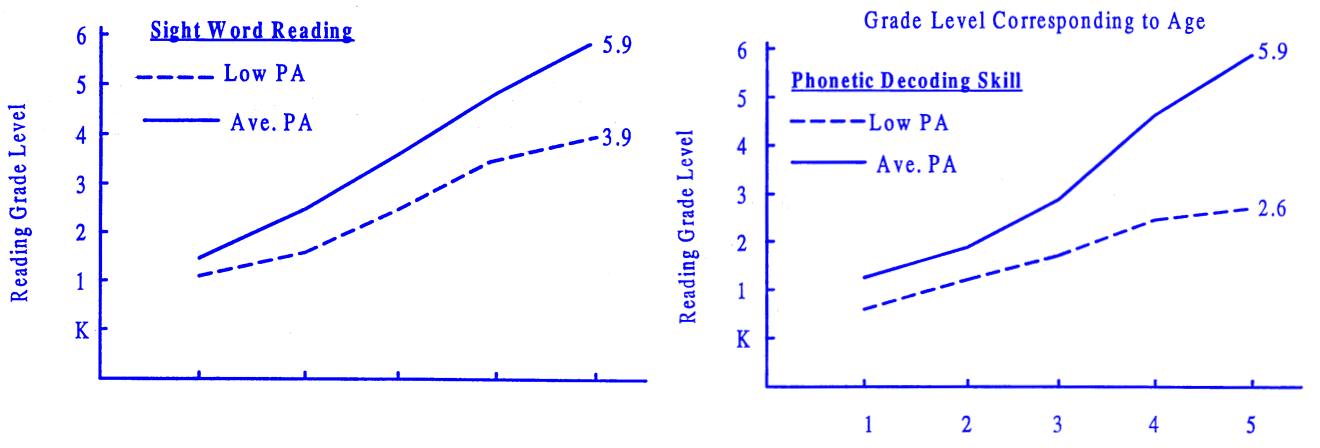

Figure 1. Growth of sight-word and phonetic decoding skill in children who begin first grade below the 20th percentile in phonological awareness.

What is the normal developmental course for phonological awareness?

Although gathering reliable information about normal growth rates in phonological awareness is one of the tasks remaining for further research, it is possible to outline some broad benchmarks of development for the early school years. In looking at the table below, it is important to remember these are all oral language tasks. They do not require any letter knowledge.

It should be remembered that "average" development in one school district may not be "average" in another. Phonological awareness at school entry varies substantially in children from different kinds of home and cultural backgrounds. Nevertheless, children who fall very far below the rate of development outlined in this table are likely to experience difficulties acquiring early reading skills.

A few recent studies have found that children may begin to develop early forms of phonological awareness as young as two and a half to three years of age. However, it is important to recognize that when we speak of phonological awareness in children as young as three years old, we are speaking of a very different level of this ability than is shown by most first-grade children. The tasks used to assess phonological awareness in young children differ in at least two important ways from those used with older children. First, many of these tasks assess sensitivity to syllables and rhyme, which are more global aspects of the phonological structure of words than phonemes. These measures assess general phonological sensitivity rather than phonemic awareness. Second, some tasks, such as those that involve judging whether words have similar beginning sounds, require a less fully explicit knowledge of phonemes than tasks that ask children to pronounce or manipulate individual phonemes in words. Tasks that assess a more general level of phonological sensitivity (such as awareness of syllables or sensitivity to rhyme) are not as predictive of reading growth as are measures that specifically assess awareness of phonemes in words.

At Age...	***The Average Child Can...***
Beginning Kindergarten	Tell whether two words rhyme. Generate a rhyme for a simple word like *cat* or *dot.* (or be easily taught to do these tasks)
End of Kindergarten	Isolate and pronounce the beginning sound in a word like *nose* or *fudge.* Blend the sounds in two-phoneme words like *boy* (/b/-/oi/) or *me* (/m/ ñ /e/).
Midway through First Grade	Isolate and pronounce all the sounds in two- and three-phoneme words. Blend the sounds in four-phoneme words containing initial consonant blends.
End of First Grade	Isolate and pronounce the sounds in four-phoneme words containing initial blends. Blend the sounds in four- and five-phoneme words containing initial and final blends.

What causes differences among children in phonological awareness?

When children enter school, there are substantial differences in their level of phonological awareness, and their response to instruction in kindergarten produces an even larger range of individual differences by the end of the school year. The factors that cause individual differences among children in phonological awareness when they enter school are genetic endowment and preschool linguistic experience.

Research conducted over the last 20 years has shown children vary significantly "in the phonological component of their natural capacity for language" (Liberman, Shankweiler, & Liberman, 1989). This phonological ability, or talent, is a trait that is strongly heritable. In other words, children can vary in their talent for processing the phonological features of language in the same way they vary among one another in musical ability, height, or hair color. In fact, large scale studies involving identical twins have shown about half of all the variation in linguistically related phonological skills is inherited (Olsen, Forsberg, & Wise, 1994).

Talent in phonological processing can vary quite independently from other areas of intellectual ability, although many studies show that it is at least moderately correlated with general learning ability. It is clearly possible, for example, to be average or above average in general intelligence while being severely deficient in the ability to acquire phonological awareness.

Sometimes, a lack of talent for processing the phonological features of language produces noticeable effects on language and speech development prior to school entry, but frequently it does not. In other words, it is possible to have a lack of talent in the area of phonological processing that does not affect the ability to become a good speaker/hearer of one's native language, but which does affect early reading development. The reason for this is that reading requires children to become consciously aware of the phonemic segments in words while speech does not.

The child's preschool linguistic environment can also exert a strong influence on sensitivity to the phonological structure of words at the time of school entry. Early experience with nursery rhymes, for example, can help children begin to notice and think about the phonological structure of words. Several research studies have shown that children who know more about nursery rhymes at age three are those who tend to be more highly developed in general phonological awareness at age four, and in phonemic awareness at age six (Bryant, MacLean, Bradley, & Crossland, 1990). Some very recent work has begun to verify that children who come from backgrounds in which they have been more frequently exposed to letters and their names and to various kinds of reading activities show more advanced phonological awareness upon school entry than those with less experience in these areas.

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After children enter school, the growth of their phonological awareness depends not only on what they are taught, but on their response to that instruction. Reading programs that contain explicit instruction in phonics produce more rapid growth in phonological awareness than approaches that do not provide direct instruction in this area. In addition, children who respond well to early reading instruction grow much more rapidly in phonological awareness than those who experience difficulties learning early reading skills. In this sense, phonological awareness is both a cause and a consequence of differences among children in the rate at which they learn to read. Those who begin reading instruction with sufficiently developed phonological awareness understand the instruction better, master the alphabetic principle faster, and learn to read quite easily. In contrast, those who enter first grade with weak phonological awareness do not respond well to early reading instruction and thus do not have the learning experiences or acquire the reading knowledge and skill that stimulates further growth and refinement of phonological awareness.

Can direct instruction in phonological awareness help children learn to read more easily?

There have been many research studies showing that it is possible to stimulate growth in phonological awareness by explicit instruction. We also know the effectiveness of oral language training in phonological awareness is significantly improved if, at some point in the training, children are helped to apply their newly acquired phonological awareness directly to very simple reading and spelling tasks (Bradley & Bryant, 1985) . For example, children who have been taught a few letter sounds and who have achieved a beginning level of phonemic awareness should be able to identify the first letter of a word when they hear it pronounced. They might also be led to substitute different letters at the beginning of a word like *cat* to make different words. They could also be asked to pronounce the "sounds" of the letters *a* and *t*, and then blend them together to form a word.

Most instructional programs in phonemic awareness begin with oral language activities. However, most also conclude by leading children to apply their newly acquired ability to think about the phonemic segments in words to reading and spelling activities. This is a very important point. Stimulation of phonological awareness should never be considered an isolated instructional end in itself. It will be most useful as part of the reading curriculum if it is blended seamlessly with instruction and experiences using letter-sound correspondences to read and spell words.

We also know from recent research that instructional programs in this area must go beyond very beginning levels of general phonological awareness to activities that draw attention to the phonemes in words. Thus, programs that only teach rhyme or syllable awareness will not be as effective as those that help children to become aware of individual phonemes in words.

Unfortunately, it is in the area of instruction in phonological awareness that many of our most important unanswered questions still lie (Blachman, in press). This, of course, does not mean we should delay implementing what we know, but rather we should be open to refinements in our knowledge in this area as research progresses. For example, we do not yet have specific information, beyond the simple distinction already made, about how much phonological awareness is optimal for beginning reading instruction. We might say, "the more the merrier," but if we concentrate too much time in developing more phonological awareness than is needed before we begin actual instruction in reading, this may be a waste of valuable instructional time. Further, it is not yet clear what the optimal combination of training tasks might be. We know training using oral language activities can stimulate the growth of phonological awareness, but it is also clear that direct instruction in phonics and spelling can also produce development in this area.

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Another important question is whether training in phonological awareness before the beginning of reading instruction can actually prevent serious reading disabilities. We know classroom-level or small-group training in phonological awareness consistently produces improvements in reading growth for groups of children. However, in all studies conducted thus far, there has always been a large range of individual differences in response to the instruction, with the most phonologically impaired children showing the least growth in response to small-group or classroom-level instruction.

It is very likely that classroom-level instruction in phonological awareness, by itself, will not be sufficient to prevent reading disabilities in children who have serious deficiencies in phonological processing. These children will require more intensive, detailed, and explicit instruction in order to achieve the levels of phonemic awareness required to support good reading growth. Although we do not know precisely what such instruction might eventually look like, one program that has been used successfully to stimulate phonological awareness in severely impaired children and adults actually helps them to discover the mouth movements or articulatory gestures that are associated with each phoneme (Lindamood & Lindamood, 1984). One of the goals of this method of instruction is to provide a way for individuals to *feel* the sounds in words as well as hear them.

On the basis of very substantial and consistent research findings, it is clear that high-quality instruction to enhance phonological awareness should be part of reading instruction for every child. This instruction will accelerate the reading growth of all children, and it appears to be vital in order for at least 20% of children to acquire useful reading skills. However, it is also clear this instruction is only one small part of an effective overall reading curriculum. Good training in phonological awareness should be combined with systematic, direct, and explicit instruction in phonics as well as rich experiences with language and literature to make a strong early reading curriculum. This balanced reading curriculum should also include early and consistent experiences with writing, both as a means to help children learn more about the alphabetic principle and to enhance their awareness of reading and writing as meaningful activities. Of course, all this instruction should be provided within a supportive, rewarding context that provides instructional adjustments for children depending upon the different ways they respond to the basic reading curriculum.

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Related Curriculum Materials

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