Phonemic awareness: Yea, nay?

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The phonemic awareness concept has had a significant influence on understanding reading and its acquisition. Students with it tend to become better readers than those without it. This feature has led to interest in teaching it prior to reading instruction. However, this focus raises several issues about phonemic awareness that are as yet not fully resolved. Is phonemic awareness causal to reading acquisition? Consequential? Or is there a mediating variable between it and reading? Is the confusion due to differences in the chosen assessment methods? Can and should it be taught independent of graphemes? If it is to be taught, which activities are important? Rhyming and alliteration? Onsets and rimes? Elision? Blending and segmenting? All of the above?

So, what is phonemic awareness?

Various terms have been employed to describe phonemic awareness, such as phonological awareness, acoustic awareness, phonetic awareness, auditory analysis, sound categorisation, phonemic segmentation, phonological sensitivity, and phonemic analysis. Most authors, such as Goswami and Bryant (1990), reserve the term phonemic awareness to imply awareness of individual phonemes, whereas phonological awareness is considered a more global term that includes the earlier developing aspects, such as rhyme and syllable awareness (Melby-Lervåg, Lyster, & Hulme, 2012).

There has also been much discussion about how best to define phonemic awareness. Ball and Blachman (1991) refer to the ability to recognise that a spoken word consists of a sequence of individual sounds. Stanovich (1986) initially defined it as the "conscious access to the phonemic level of the speech stream and some ability to cognitively manipulate representations at this level" (p. 362). Later (1992, 1993), he suggested that the terms "conscious" and "awareness" themselves have no acceptable definitions, and he subsequently recommended phonological sensitivity as a generic term to encompass a continuum from shallow to deep sensitivity. This term acknowledges the wide range of tasks used to assess levels of sensitivity. As these alternatives have not gained currency, phonemic awareness will continue to be used here as implying both the knowledge of, and the capacity to manipulate, phonemes – acknowledging that the definition continues to have limitations. It is argued that both synthesis (also known as blending or telescoping) and analysis (also known as phoneme segmentation) are important elements of phonemic awareness – with synthesis usually preceding segmentation (Ouellette & Haley, 2013).

What is clear is that phonemic awareness concerns the structure of spoken words rather than their meaning. To understand the construction of our written code, readers need to be able to reflect upon the spelling-to-sound correspondences. To understand that the written word is composed of graphemes that correspond to phonemes (the alphabetic principle), beginning readers must first have some understanding that spoken words are composed of sounds (phonemic awareness), rather than conceiving of each word as a single indivisible sound stream. This awareness appears not to be a discrete state, but rather a sequence of development ranging from simple

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to complex, or – as Stanovich (1992, 1993b) would prefer – from shallow to deep.

A problem arising from differing definitions is that the tasks used to assess phonological or phonemic awareness also differ significantly. This problem of no common metric makes it difficult to compare study outcomes and obtain a high degree of consensus concerning causality.

Does development follow a sequence?

Although some authors suggest variations in the sequence (Ehri et al., 2001), the levels of phonological development from shallow to deep phonemic awareness have been delineated as follows:

Recognition that sentences are made up of words
Recognition that words can rhyme - then production thereof
Recognition that words can be broken down into syllables - then production thereof
Recognition that words can be broken down into onsets and rimes - then production thereof
Recognition that words can begin with the same sound - then production of such words
Recognition that words can end with the same sound - then production of such words
Recognition that words can have the same medial sound(s) - then production of such words
Recognition that words can be broken down into individual phonemes - then production thereof
Recognition that sounds can be deleted from words to make new words - then production thereof
Ability to blend sounds to make words
Ability to segment words into constituent sounds

It has been argued that these skills are hierarchical, and it's true that the correlations with reading increase as the complexity of the tasks increases – from low level skills such as syllable recognition to high level skills such as blending sounds (Manolitsis & Tafa, 2011). It may also be that the sequence is at least partly dependent on the experiences of individual students. The more focussed and structured the experience, the more likely it is that a student will have progressed to higher levels compared with same-age peers (Samuelsson et al., 2008). Additionally, there may be genetic effects that influence the ease with which individual students make phonological progress (Soden-Hensler, Taylor, & Schatschneider, 2012).

Research has not yet provided a clear picture of the developmental progression, partly because of the dearth of longitudinal studies and the lack of adequate assessment tools that can be administered to young children (Braze, McRoberts, & McDonough, 2011). Some even argue that the mooted progression may not be the typical experience:

> Therefore, to conclude, the outcome of our study suggests that it is no longer helpful to characterise phonological development in terms of a fixed sequence because this type of generalisation obscures important variation that occurs in response to the demands of the assessment task, the type of instruction taking place in the classroom and the nature of the spoken and written languages under investigation (Duncan et al., 2013, p.417).

Phoneme Awareness

Awareness at the level of the phoneme has particular significance for the acquisition of reading because of its role in the development of the alphabetic principle – that the written word is simply a means of codifying the sound properties of the spoken word. In order to decode the written word, the child needs to appreciate the logic of the writing system and, as a prerequisite, the logic of oral word production.

There are two requirements of beginning reading for which phonemic awareness becomes immediately relevant: phonemic analysis (segmentation) and phonemic synthesis (blending). For most children, the ability to produce the finer discrimination of phonemes begins in about Year One of their schooling (Ball, 1993). Individual phonemes are more difficult to specify because their acoustic values vary with the phonemes that precede and follow them in a word (a phenomenon called co-articulation), whereas, syllables have relatively constant values in a word and hence should be more readily recognised. The fact that consonants are "folded" into vowels can be understood by noting the different tongue positions for the beginning /d/ sound when it is followed by /oo/ and by /i/.

In most children the ability to synthesise (blend) sounds into

words occurs earlier than analytic (segmentation) skills (Bryen & Gerber, 1987; Caravolas & Bruck, 1993; Solomons, 1992; Torgesen et al., 1992; Yopp, 1992). Thus, it is easier for children to respond with the word cat when presented with the sounds c - at or c-a-t , than it is to supply c-a-t when asked to tell what sounds they hear in cat.

Tasks used to assess beginning (or shallow) phonemic awareness tend to emphasise sensitivity to rhyme and alliteration; for example, finding a word that begins or ends with the same sound as the stimulus word. A more complex task would involve the manipulation, or separation of sounds in a word, for example, What is the first sound you hear in cat? What word is left if you remove the /t/ from stand? (Torgesen et al., 1994). Other tasks used for assessment may include counting the sounds in words, adding, deleting or manipulating sounds, and categorising sounds at the beginning, middle, or end of words. The deletion task, while it has good reliability (Lervåg et al., 2009), also has a strong working memory element.

There are now numerous normed and unnormed tests available. Some are available from publishers, such as the Comprehensive Test of Phonological Processing (CTOPP; Wagner, Torgesen, & Rashotte, 1999) whilst some are free from the Net, such as Dynamic Indicators of Basic Early Literacy Skills (DIBELS; University of Oregon, 2002a) or the Abecedarian Reading Assessment (Wren & Watts, 2002). There is also the Phonological Awareness Literacy Screening (PALS) test online. PALS is the state-provided screening tool for Virginia's Early Intervention Reading Initiative (EIRI). A useful resource in making decisions about which test to employ is an extensive and thorough review by Kame'enui (2002).

As indicated above, deeper levels of awareness (i.e., at the phoneme level) tend to develop during first grade upon exposure to reading instruction. Some have argued then that phonemic awareness may be a consequence of learning to read rather than a causal factor in its development (Morais et al., 1987; Morais, 1991). There is increasing consensus that the data are best explained by considering the relationship between phonemic awareness and reading development as a reciprocal one (Duncan et al., 2013; Stanovich, 1992).

Might phonemic awareness be a consequence of reading development?

If that were the case, is there a purpose to attempting to teach it prior to reading instruction? If it were strictly true, then it should not be possible to teach phoneme awareness without recourse to letters. Yet there are numerous studies showing that it can be taught as a purely oral skill. There is some confusion here, as some studies use the term phonological awareness as synonymous with phoneme awareness, while others confine the meaning of phoneme awareness to the higher order processes such as blending and segmenting. Additionally, many different tools have been employed to measure progress; some formal normed tests, and others experimenter designed curriculum-based measures. So perhaps the best position for now is to assume the reciprocality assertion (Duncan et al., 2013; Stanovich, 1992).

A threshold phonemic awareness level may be beneficial (though not sufficient) for beginning reading development, but as reading develops, increasingly the student becomes more sensitive and better able to manipulate sounds at the phoneme level. Additionally, as orthographic skills develop, some phonemic awareness tasks may be completed without recourse to phonology at all (Castles & Coltheart, 2004; Duncan et al., 2013).

> Such findings favour the idea of reciprocal causation whereby phoneme awareness, letter knowledge, and reading skills interact in the process of learning to read and phoneme awareness develops rapidly in readers who primarily encounter consistent grapheme–phoneme relationships (Nag & Snowling, 2012, p.405).

The acquisition of phonemic awareness is not guaranteed simply through maturation; in fact, about a third of students require varying degrees of assistance to promote its development (Adams, 1990). If they don't receive this help, many will employ less effective strategies, such as attempting to remember every word as a unique picture, or by various guessing strategies.

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So, if you consider that phoneme awareness needs to be taught separately what do you teach?

Do you purchase one of the many available texts such as the classroom curriculum by Adams, Foorman, Lundberg, and Beeler (1998) and work your way through the oral activities, or do you contrive your own? That depends upon your own phonological ability along with a capacity to create effective and efficient instruction, and the tools to continuously assess the results of your intervention. Such activity should not be inordinately long, as literacy time is too valuable to spend on marginal issues (so, maybe 20 hours).

There are also many resources provided by education departments and other organisations online, such as at

http://www.phonologicalawareness.org/

http://pbskids.org/games/index.html

http://www.readingresource.net/,

http://www.starfall.com.

http://www.doe.virginia.gov/instruction/virginia_tiered_system_supports

There are also various free or

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cheap apps that would suit either home-based or school-based phoneme awareness development, such as at
http://www.loveandreilly.com.au,
http://pbskids.org/apps/,
https://itunes.apple.com/au/app/profs-phonics-1/id511712292?mt=8
https://sites.google.com/site/faveapps/reading/phonemic-awareness

Should you include letters (graphemes) in your otherwise oral phonemic awareness curriculum?

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 (Torgesen & Mathes, 1998, p. 9).

A question often asked about phoneme awareness training that precedes reading instruction is the degree to which the phonological skills will transfer to the reading task. Will students have forgotten such oral skills by the time reading instruction commences? Will they remember them, but not perceive the benefits in making use of them? Will they remember them, and appreciate the potential benefits in making use of them, but can't see how to incorporate the oral skills into the decoding task? Presumably, one role for a beginning reading teacher is to make salient to the reading task those phoneme awareness skills previously developed. If this is to be part of the teacher's curriculum, then a closer knit between the phoneme awareness training and the beginning reading instruction is advisable. Certainly, if the teacher's initial instruction is meaning-dominated or has an initial whole word emphasis, then students are unlikely to notice that phonological skills can be helpful.

> Overall, the data suggest that there is little value in training pre-schoolers in either letter forms or sounds in isolation in advance of providing instruction on the links between the two (Castles, Coltheart, Wilson, Valpied, & Wedgwood, 2009, p.68).

So, perhaps one should bypass the oral phonemic awareness activities, and move directly to the phonic processes of segmenting and blending (including letters not solely sounds) because they are activities more directly salient to reading. Additionally, it has been argued that letter-sound knowledge enhances phonemic awareness skills (Carroll, 2004), so a link between letter-sound associations and phoneme awareness may have several benefits.

Engelmann's (1999) take is that phonemic awareness has no purpose other than to assist decoding, and hence any attention to it should be tied closely to decoding. Hence, he recommends treating the proximal rather than distal proposed causes:

> The demonstration that phonological manipulations are precise components of a beginning word reading operation can be seen by constructing a task that is as similar as possible to a beginning decoding task but that does not refer to any symbols. It is a verbal skeleton of the task.

This perspective really involves a return to the initial teaching of phonics, which was the norm for code-oriented teachers prior to the phonemic awareness revolution. Prior to the introduction of pre-reading phonemic awareness, blending and segmenting were a normal part of phonics instruction (although without the name phonemic awareness).

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> At the current state of knowledge, it is adequate to conclude that the systematic instruction of letter-sound correspondences and decoding strategies, and the application of these skills in reading and writing activities, is the most effective method for improving literacy skills of children and adolescents with reading disabilities....The present results demonstrate that when phonemic awareness interventions are provided to school-aged children and adolescents with reading difficulties, they do not have a significant effect on a child's reading or spelling performance. This indicates that phonemic awareness and reading fluency trainings alone are not sufficient to achieve substantial improvements. However, the combination of these two treatment approaches, represented by phonics instruction, has the potential to increase the reading and spelling performance of children and adolescents with reading disabilities (GaluschkaIse, Krick, & Schulte-Körn, 2014, p.9).

So, where does that leave the significance of phonological processing in learning to read?

Here are some differing perspectives:

> A strong argument has been made for a causal relationship between reading and phoneme awareness. (Melby-Lervåg, 2012, p. 101).

> During the past four decades many explanations of reading disorders have been put forward ... visual processing, auditory discrimination, cross-modal transfer, eye movements, serial memory, attention, association learning, or rule learning. Most of these were eventually rejected due to a lack of supportive evidence ... In contrast, the phonological deficit hypothesis has clearly stood the test of time. (Tunmer, 2011, p. x).

> The results revealed no support for the theory that a preceding phonological awareness deficit caused the reading deficit in the risk children, since only a very small proportion of the risk children exhibited

phonological awareness problems in kindergarten and only part of these children developed a reading deficit. (Blomert & Willems, 2010, p.312).

Our results suggest that phonological awareness as measured by widely used tests is not as important for early literacy learning as many researchers and educators believe (e.g., Adams, 1990; Ehri et al., 2001; Lundberg, 1991). ... Current phonological awareness tests, it appears, demand more phonological skills than certain aspects of literacy learning do. ... We think that children need some phonological skills to learn about the sounds that letters represent and to learn how to combine letters to read and spell words. Like several other researchers (Castles & Coltheart, 2004; Snowling & Hulme, 1994), though, we conclude that phonological awareness as currently assessed is not a good measure of the phonological skills that are needed to learn to learn about letters and reading (Treiman, Pennington, Shriberg, & Boada, 2008, p.1336).

There is now a large, complex, and sometimes seemingly contradictory literature on the associations between different phonological skills and learning to read. This meta-analytic review substantially clarifies the patterns in this literature. It appears that phonemic skills measured in children at the earliest stages of learning to read are closely related to the early growth in children's word reading skills. We have argued that converging evidence from longitudinal and training studies suggests that this relationship may be a causal one, such that adequate phonemic skills may be one prerequisite for learning to read effectively. These effects seem to be essentially universal across the different alphabetic languages that have been studied. In contrast, the two other skills considered here (rime awareness and verbal short-term memory) are less closely correlated with individual differences in learning to read, and their relationships with reading seem to be explicable in terms of shared variance with phonemic skills. These findings have important applied implications (Melby-Lervåg, Lyster, & Hulme, 2012, p.21).

Individual differences in phonological awareness are closely related, concurrently and longitudinally, to variations in reading achievement (e.g., Lonigan, Burgess, & Anthony, 2000; Muter, Hulme, Snowling, & Stevenson, 2004; Wagner et al., 1997). Evidence supporting a causal role of phonological awareness in reading development comes from studies showing that training phonological awareness improves reading (e.g., Lundberg, Frost, & Petersen, 1988; Schneider, Küspert, Roth, Visé, & Marx, 1997; but see also Castles & Coltheart, 2004; Hulme, Snowling, Caravolas, & Carroll, 2005). (Duff & Hulme, 2012, p. 505).

The present study demonstrated that the training provided by phonics instruction, rather than learning to read per se, appeared sufficient to trigger excellent explicit sensitivity to phonemes across languages by the end of the first school year. (Duncan et al., 2013, p.415).

Given that the story is incomplete, and given all of the independent evidence about phonological factors in literacy growth, they will, and ought to, continue to be an important focus in the broad research agenda to understand how all children learn to read and why some find it a more challenging assignment than others. (Byrne, 2011, p.191).

Finally, it is clear from the research that purely code-based interventions, as important as they are, do not constitute a complete reading program. The Big Five variables highlighted in the report of the National Reading Panel (2000) include fluency, vocabulary, and comprehension instruction. Instruction in these variables produces symbiotic effects – each skill enhancing the other. For example, vocabulary instruction and comprehension instruction have been found to increase phonemic awareness beyond that achieved solely by phonemic awareness training (Al Otaiba et al., 2008; Ouellette & Haley, 2013).

The acquisition of phonemic awareness is not guaranteed simply through maturation; in fact, about a third of students require varying degrees of assistance to promote its development. If they don't receive this help, many will employ less effective strategies, such as attempting to remember every word as a unique picture, or by various guessing strategies.

Confused? So, what's the conclusion about phonology?

Encourage families to include word structure activities in their young children's games, such as nursery rhymes, I Spy, Pig Latin, and creating words with magnetic fridge letters. They can also encourage aspects of print awareness by showing how print differs from pictures (Robins, Treiman, Rosales, & Otake, 2012). Whether these activities will have a measurable priming effect for

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children when they begin to address the literacy challenge is not yet solidly research-grounded. However, in the absence of a clear consensus, and accepting that the activities are not harmful (and may be fun), it is a worthwhile enterprise.

In school, assess all students on arrival using a combination of phonemic awareness and letter-sounds/name fluency measures (and possibly include a naming speed task). Assume that those students who struggle with these tasks will require intensive intervention from the beginning. Adopt a response-to-intervention model to ensure these students are not left to languish. Plan for extended oversight and intervention for this cohort. While the debate on a causal role for phonemic awareness continues, assume there is such a relationship. Include phonemic awareness activities, initially on blending and segmenting - introducing letters at this time or before to assist integration of the skills. Explicitly tie phonemic awareness activities into your initial phonics program. For any students who struggle with blending and segmenting, first increase practice opportunities by increasing allocated time. If this is ineffective, consider introducing simpler phonological activities, such as rhyming and alliteration before returning to blending and segmenting.

Maintain a regimen of continuous evaluation. Teach all relevant skills to fluency. Encourage parental participation with regular teacher-parent contact and shared programming to increase engaged literacy time. Provide additional training in content and method to those teachers in need. Anticipate initial teacher resistance, but develop an evidence-based culture in the school that values data. Expect that it will be a long, but worthwhile endeavour. Bear in mind, too, that phonology ain't everything. Due attention must also be paid to other important aspects of literacy, such as comprehension, reading fluency, and oral language, including vocabulary.

References

This article is based on an abbreviated version of Dr Kerry Hempenstall's blog post of the same name, kindly used here with his permission. The original post, complete with full bibliographic details for all in-text references, can be found at the following web address.

http://www.nifdi.org/news/hempenstall-blog/456-phonemic-awareness-yea-nay

From the LDA Bulletin, Volume 47, No 1, Autumn 2015
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