

Learning to Read Words: theory, findings, and issues. Linnea C. Ehri. (2005)
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Adapted from Linnea Ehri's Distinguished Scientific Contributions Award address at the annual meeting of the Society for the Scientific Study of Reading held in Amsterdam, The Netherlands, June 2004.

Highlights.

(provided by Charles Arthur)

Abstract: With practice, all words come to be read automatically by sight, which is the most efficient, unobtrusive way to read words in text. The process of learning sight words involves forming connections between graphemes and phonemes to bond spellings of the words to their pronunciations and meanings in memory. The process is enabled by phonemic awareness and by knowledge of the alphabetic system, which functions as a powerful mnemonic to secure spellings in memory.

Introduction

One of the great mysteries that has challenged researchers is how people learn to read and comprehend text rapidly with ease. When people read text, the print fills their minds with ideas. The route to these ideas begins with individual printed words. Eye movement studies show that when readers read a text, their eyes land on practically every word (Rayner & Pollatsek, 1989)

Words are the basic units that readers' eyes pick up and process to construct meaning out of print. The key to understanding how reading skill develops is understanding how beginners learn to recognize written words accurately and automatically.

Sight Word Reading

When sight words are known well enough, readers can recognize their pronunciation and meanings automatically without any attention or effort at sounding out letters (LaGerg & Samuels, 1974) (this is done almost involuntarily) (It happens automatically, and is not a matter of choice. ...word reading operates unconsciously. ...each of the other ways of reading words requires conscious attention. ... this disrupts comprehension, at least momentarily.

Sight Word Learning

The process at the heart of sight word learning is a connection-forming process. Connections are formed that link spellings of written words to their pronunciations and meanings in memory. (The visual explanation for the 'look-say', whole-word method of teaching reading) does not explain how the spellings of words are capable of being encoded in memory easily with very little practice. They do not explain how skilled readers are able to recognize many thousands of words in an instant with high accuracy.

The connections (between spellings and sounds in pronunciations) are formed out of readers' knowledge of the alphabetic system. This includes knowledge of grapheme-phoneme relations and phonemic awareness, that is, knowing how to distinguish the separate phonemes in pronunciations of words. When readers learn a sight word, they look at the spelling, they pronounce the word, they distinguish separate phonemes in the pronunciation, and they recognize how the graphemes match up to phonemes in that word. Reading the word a few times secures its connection in memory.

This connection-forming process also depicts memory for irregularly spelled words. It turns out that most letters in irregularly spelled words conform to grapheme-phoneme conventions.

Knowledge of these graphophonemic relations must be learned through either explicit instruction or implicit instruction and practice before bonding can occur. As readers learn about spelling patterns that recur in different words, these larger units are used to form connections to remember words. These chunks include spellings of common little words appearing in larger words, spellings of common rimes, and spellings of morphemes and syllables.

When readers acquire sufficient knowledge of the alphabetic system, they are able to learn sight words quickly and to remember them long term. Sight word learning this rapid and lasting is possible only because readers possess a powerful mnemonic system in the form of alphabetic knowledge that is activated when words are read.

To summarize, readers learn to process spellings of words as phonemic maps that lay out elements of their pronunciations visually. Beginners become skilled at computing these mapping relations spontaneously when they read new words. This is the critical event for sight word learning. Grapheme-phoneme connections provide a powerful mnemonic system. They provide the glue that bonds letters in written words to their pronunciations in memory along with meanings. Once the alphabetic mapping system is known, readers can build a vocabulary of sight words easily.

(comment: The genius of an alphabetic writing system is that it connects reading and writing to innate spoken language abilities.)

Phases of Development

(Ehri has identified and studied four phases of development towards full automatic sight word reading: pre-alphabetic, partial alphabetic, full alphabetic and consolidated alphabetic. These are not stages that need to be learned in sequence, but phases that “simply characterize the predominant types of alphabetic knowledge.)

One advantage of representing sight words completely in memory is that word reading becomes much more accurate, and similarly spelled words are seldom confused. At this phase, readers are able to decode unfamiliar words, they can invent spellings that represent all the phonemes, and they can remember correct spellings of words better than partial phase readers.

The consolidated phase emerges as full phase readers retain increasingly more sight words in memory. As they become familiar with letter patterns that recur in different words, the grapheme-phoneme connections in these words become consolidated into larger units. These include spellings of rimes, syllables, morphemes, and whole words that have become unitized. Knowing letter chunks is valuable for remembering how to read multisyllabic words. Readers who know the relevant chunks can learn a word such as interesting more easily, because fewer connections are required to secure the word in memory. The number is reduced from 10 grapheme-phonemes to four syllabic chunks.

(Visually learning correct spellings of words improves memory for spoken words.)

(All of) this constitutes one more reason why beginners need a strong alphabetic foundation when they learn to read. It helps them acquire new reading vocabulary.

These findings bear on Share’s (1995, 1999, 2004) self-teaching mechanism. They raise questions about the claim that learners need to apply a decoding procedure to retain sight words in memory when the words are read (as mature readers). ...This suggests that it is not the conscious application of a decoding procedure (i.e., sounding out letters and blending them) that is critical, at the final stage

of reading, but the implicit, spontaneous activation of alphabetic knowledge that connects graphemes to phonemes to secure the spellings of specific words in memory. Use of a decoding strategy may help students apply (and acquire) this knowledge, but it is the knowledge rather than the act of decoding that is critical (for skillful reading).

Relevance to Transparent Orthographies

Several European alphabetic languages (use) two dimensions, orthographic depth and syllabic complexity. The English writing system stands apart from the other languages in being both deep and complex. This suggests that English might very well be a unique case.

It is important to note that even when sight words are unitized and read from memory, the process of accessing them in memory is still phonological in that graphophonemic connections are rapidly activated to retrieve pronunciations and meanings in memory.

In some transparent languages the partial alphabetic phase might not be relevant. (A comparison was made of) kindergartners who were receiving instruction with a whole-word method to beginners taught with a phonics method. After about 3 months of reading instruction, (it was) found that the whole-word group did exhibit the partial phase in their reading and spelling. In contrast, beginners who were taught with the phonics method did not show evidence of the partial phase but started out reading by decoding words.

(comment: In an analysis in a Share (2004) study, it was determined that just saying or sounding out individual letters in words was insufficient. Students could not remember the words. Ehri asserted that it was important that the letters be sounded out in blending fashion to pronounce the words as identifiable wholes so they become word units in memory. The sounds of letters in the spellings must be connected to units of whole words. It was also stated that care must be given to how hard the words were for beginning readers.) Decoding skills may not be sufficient to move readers to the full phase if they are not practiced as a tool for building a sight vocabulary but are simply applied as a strategy for sounding out the letters in words.

(comment: how is it possible that connections between spellings and pronunciations can be learned so thoroughly and eventually quickly after the use of an alphabetic writing system is learned? How are these units of speech and written language able to be so tightly bonded? Answer to this question can be found in the following report by Ehri)

“Grapheme-phoneme Knowledge is Essential for Learning to Read Words in English”. Linnea Ehri. Chapter 1, in **Word Recognition in Beginning Literacy**. Jamie L Metsala and Linnea Ehri (eds.) (1998)

Basic Processes to Explain

Learning to read involves two basic processes. One process involves learning to decipher the print; the other involves comprehending the meaning of the print. When children attain reading skill, they learn to perform both of these processes in a way that allows their attention to focus on the meaning of the text while the mechanics of reading, including deciphering, operate unobtrusively and out of awareness for the most part.

How do beginners achieve this mature state of reading? Can simple practice of reading text lead to mature forms of reading, just as practice of learning to speak leads to mature speaking abilities? Is there anything special about reading that might be hard to learn and might not be acquired through

practice? To answer these questions, we need to clarify the nature of the processes involved in reading and learning to read.

It is important to note that children acquire comprehension skill in the course of learning to speak. ...However, children do not acquire deciphering skill in the course of learning to speak. This achievement requires special experiences that do not occur in the normal course of conversations between parents and children, or even in sessions where parents read books to their children.

Processing spoken language is not governed by “end” organs such as eyes or ears, but rather is governed by central phonological structures in the brain. Such processing far exceeds the limits of the ear. The critical phonemic segments that speakers and listeners must process do not lie in the signal itself; rather they lie in the brain and are detected and processed successfully by speaker and listeners because they both possess the same mental equipment.

These facts about speech make it apparent why learning to decipher print is not the “natural” process that learning to speak is. The brain is specialized for processing spoken language, but it has no special central equipment for processing written language. In order for reading and writing skills to develop, what needs to happen is that written language must penetrate and gain a foothold in the central equipment used to process speech. Graphemes must become attached to “deep” phonemes, not simply to “surface” sounds within words. Such penetration and attachment, however, are not straight-forward steps, because speech is seamless on the surface, with no breaks signaling phonemic units. Special experiences are needed to engage the brain in deciphering print.
(comment: thus making mature reading “nearly” a natural process?)

Reading Words in text

Readers’ processing letters and words in the text is referred to as *deciphering skills*. *Lexical knowledge* refers to something like a dictionary of words that readers hold in memory.

One way to read words is to determine the sounds of letters and blend them into pronunciations that approximate real words. This is a strategy that enables readers to read words they have never before seen. Whereas beginning readers decode words by attacking individual letters, more advanced readers process chunks of letters when they decode words.

A very different way to read is by sight. With sufficient practice, all words acquire status as sight words. Sight of the written word activates its spelling, pronunciation, and meaning immediately in memory, without any decoding steps required. ... You can tell when readers are reading words by sight because they read the words as whole units, with no pauses between sounds, and they read the words within one second of seeing them. When sight words are known well enough, readers can recognize their pronunciation and meanings automatically. That is, they can read these words without expending any attention or effort decoding the words. They recognize these words instantly, even when they try to ignore them. The ability makes sight word reading especially valuable for text reading. ... It turns out that automaticity of word reading is the secret of efficient text reading.... Being able to read words by sight automatically is the key to skilled reading of text. This allows readers to process words in text quickly, without attention directed at the word itself.

I suggest that establishing sight words in memory is the way that written language gains a foothold in the central mechanism that regulate speech. This allows readers to use their knowledge of speech to process written language.

(comment: however to perform this function, the reader's eyes must be trained to pay attention to the details of the printed words. This is not a natural process. It must all be learned in order to trigger the automatic word reading process necessary for reading text and making sense of it.)

Sight Word Learning Requires Alphabetic knowledge

To explain sight word reading, we must specify how readers are able to look at printed words they have read before and recognize those specific words while bypassing thousands of other words (in memory) including those with very similar spellings or meanings. ... The kind of process we have found to be at the heart of sight word learning is a connection-forming process. Connections are formed that link the written forms of words to their pronunciations and meanings. This information is stored in the reader's mental dictionary or lexicon.

The traditional view of sight words holds that readers memorize associations between the visual shapes of words and the meaning. (This cannot explain how readers are) able to recognize in an instant any one of many thousands of words. ... Moreover, skilled readers can remember how to read new sight words with very little practice. Memorizing arbitrary associations between the shapes and meanings of words cannot explain how skilled readers do what they do. Sight word reading must involve remembering letters in the words. These are the distinctive cues that make one word different from all the others.

Findings of my research indicate that readers learn sight words by forming connections between graphemes in the spellings and phonemes underlying the pronunciations of individual words. The connections are formed out of readers' general knowledge of grapheme-phoneme correspondences that recur in many words. ... this secures the sight word in memory.

In order to secure complete representations of sight words in memory, readers need sufficient familiarity with letter shapes. They need to know how to distinguish the functional (letter) units that typically symbolize phonemes in words. They need to know how to segment pronunciations into constituent phonemes that match up to the (letters) they see in spellings. It is in performing this graphophonic (letter/sound) analysis for individual words that the spellings of words penetrate and become attached to reader's knowledge of spoken words in a way that links written language to the central mechanism governing spoken language.

There are three graphophonic capabilities that enable beginners to secure complete representations of sight words in memory: knowledge of letter shapes, knowledge of how letters typically symbolize phonemes in words, and phoneme segmentation skill.

Conclusion

It is important that teachers make sure that the alphabetic foundation for learning to read is well established during the first year of instruction. The ground to cover (during this year) includes teaching phonemic awareness, letter knowledge, decoding, sight word reading, and spelling as well as teaching how these skills are incorporated into text reading and writing. Students will have a better chance of achieving subsequent milestones with the proper foundation in place. Later milestones include achieving speed and automaticity in reading sight words during text reading, and advancing to the consolidated phase in acquiring knowledge and use of the alphabetic system for reading and writing. (This is not easy). It requires a professionally trained teacher who understands the processes I have discussed here, who knows how to cultivate them through instruction, and who can tell through observation and assessment whether each student is making satisfactory progress.