Hidden Components of Reading & Spelling

By Linda Balsiger, M.S., CCC-SLP

Once a child learns the alphabet, isn't "sounding out" words and learning sight words a natural progression? For many it is, but some children have hidden processing deficits that hinder their ability to become successful readers. What are some of the underlying skills needed for success in reading and spelling?

Phonological Awareness

Phonological Awareness is the ability to distinguish and manipulate sounds in words. Early phonological awareness skills include the ability to identify words that rhyme, produce rhyming words, identify the initial and final sounds of words, and learn the sound-letter associations for the alphabet. Other skills that are needed by the end of kindergarten are the ability to blend sounds into words, and the ability to break a word apart into its distinct sounds (*cat* = c + a + t). Children should also be able to substitute or delete sounds from words. For example, they should be able to tell you that *crash* without the /r/ is *cash*, or that changing the /l/ in *play* to a /r/ makes *pray*. These tasks seem easy and natural to most children, yet can be very difficult for others. Children who lack phonological awareness face significant difficulty with reading and may be at risk for dyslexia – a disorder in the ability to process the phonological components of language.

Phonological Memory and Sequencing

Phonological Memory is an area of working memory where sounds are stored when a reader is attempting to decode a word that they don't recognize. For example, early readers store the sounds /s + p + l + a + sh/ as they attempt to "sound out" the word *splash*. They must "hold" these sounds in working memory in the correct sequential order in order to blend them together to make a word. As reading skills progress, readers hold the syllables of multi-syllabic words in memory instead of individual sounds. Readers with poor phonological memory or weak sequencing skills will often substitute a sound, leave out a sound, or transpose the order of sounds in a word. Spelling is the same thing in reverse – where the speller must break a word into its sounds, hold them in the correct sequential order, and then transcribe the letters for those sounds.

Visual Memory

Visual memory is important for learning to recognize common sight words that can't be "sounded out". Readers with poor visual memory mix up words such as *how/who* and *from/for/form*. Weak visual sequential memory makes spelling of sight words difficult as well, and transpositions of letters are common.

Visual-Linguistic Retrieval Efficiency

Visual-linguistic retrieval efficiency refers to the speed with which a person can process visual information and retrieve and verbalize the name or sound that represents it. This involves many different areas of the brain – located in the left hemisphere for most people. This processing loop includes the occipital lobe (visual processing), Wernicke's area of the temporal lobe (language processing), the angular gyrus, and Broca's area of the frontal lobe (speech production). Weaknesses in visual processing of orthographic patterns, in the "look up" of words or sounds/syllables, or in the transmission between areas of the brain can slow this process down. Oftentimes, persons with dyslexia bypass or underutilize portions of the normal reading "circuitry", and rely heavily on compensatory routes for processing.

The efficiency of this retrieval-processing loop can be assessed by testing how quickly a child can verbalize the names for alphabet letters or numbers, the names for colors, or the names of objects. These "rapid naming" skills are highly correlated with reading fluency and reading disorders, due to the rapid linguistic retrieval and phonological processing (of sounds, syllables, and whole words) that is needed for fluent reading. This retrieval and processing loop needs to be highly automatic because it is exercised repeatedly during reading. Brain studies show significant differences in the use of these brain circuits in persons with dyslexia. Research has shown that after specialized intervention, the brain pathways begin to resemble those of "normal" readers.

What if these skills are missing?

As you can see, successful reading and spelling requires many underlying processing skills. Children who are poor readers or spellers typically have deficits in one or more of these areas, and need specialized treatment to develop those skills. A learning evaluation should assess all of these underlying skills, in addition to basic skills in reading, writing, and spelling. Only then can a proper treatment plan be developed. Trying to improve reading without strengthening these underlying skills is like trying to walk without legs or trying to read without first learning the alphabet!

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