What Skills are Required for Fluent Reading? Rapid Naming, Reading Fluency, and the Search for the Nature of Dyslexia

Is reading a visual, or a verbal, task? This question was at the heart of the research into developmental dyslexia for much of the 20th century. On one hand, we read with our eyes; clearly, visual processing plays a role in reading. On the other hand, researchers studying the development of reading skill have known since the 1970s that early reading depends upon a language-based skill, termed phonological awareness. Phonological awareness, or PA, is the ability to accurately perceive and identify phonemes, which are the smallest component parts (the ‘molecules’) of our spoken language. Further, they learned that accurate mapping of phonemes, or sound units, to graphemes, or sound symbols, lays the groundwork for accurate decoding of letters, letter combinations, and ultimately, words. Researchers found that many children with dyslexia had trouble with phonological awareness, further supporting the phonological theory of dyslexia.

However, as is often the case, that is not the end of the story. Some children with severe dyslexia have intact phonological, and decoding skills. They are able to decode words, but are unable to read efficiently, and with fluency. It turns out that, at the same time as the research on PA was being done, other researchers were investigating the connections between the visual and verbal pathways in the brain. One of these researchers, Martha Bridge Denckla, MD - who currently serves on The Board of Trustees of The Lab School -- was developing a task in which individuals are asked to name familiar objects, such as colors, letters, or numbers, as quickly as they can. It turns out that this skill -- which Dr. Denckla termed ‘rapid automatized naming’ (RAN) -- identified children with reading difficulties. Dr. Denckla describes the processes involved in RAN as “see it, say it” skills. Her findings suggested that the ability to efficiently “see it, say it” is a critical skill for learning to read fluently.

Research into both PA and RAN has continued over the past several decades, and the use of brain-based research approaches, such as fMRI, has furthered our understanding of these two processes. PA continues to be seen as a core language-based deficit underlying dyslexia in many children. RAN’s “see it, say it” skill captures a number of neurological processes required for fluent reading, including the capacity to memorize familiar visual forms (e.g., letters) by sight, and the capacity to automatically link those visual forms with their phonological labels. In other words, RAN captures the ability to quickly identify letters, and to automatically know the sounds associated with each letter. Longitudinal research conducted with students has supported the notion that RAN “taps mechanisms that are causally related to the growth of reading skills” in young children (Lervag & Hulme, 2009).

Recent research has investigated how these two deficits, PA and RAN, relate to one another, and which aspects of reading skill they are best able to predict. One study by Cronin (2011) identified four groups of students in Kindergarten: students with phonological deficits, students with RAN deficits, students with neither deficit, and students with both deficits (the ‘double deficit’ group). Between Kindergarten and fifth grade, students with the double deficit showed
the least growth in word identification and passage comprehension, with the greatest deficit in decoding skill. In other words, both PA and RAN predicted reading development in the elementary years, and students with both deficits showed the greatest impairment.

The fact that these two skills, PA and RAN, are essential for reading makes sense, when we reflect on it. Decoding the letters of our language is a key building block for early reading, particularly in the elementary grades; the earliest stages of reading involve decoding larger and larger words. However, once we become fluent readers, how many words do we actually decode? Very few, in fact. The vast majority -- well over 90% -- of words read by successful readers are 'sight words;' they are instantly identified, from visual memory. This automaticity speeds up the process of reading significantly, and frees the brain up for the more important task of comprehension. Without rapid automatized naming, and the reading fluency that results from it, we would spend most of our energy decoding words, and very little of it would be available for understanding what we read.

As with all complex research efforts, there continues to be debate about the relationship of these two foundational reading skills. Some researchers believe that RAN constitutes a subset of phonological awareness, because it involves associating visual symbols with phonological information (Vaessen, Gerretsen, & Blomert, 2009). Other researchers have put forth evidence supporting a 'double deficit hypothesis,' which states that PA and RAN are separate skills, each of which are necessary, but not sufficient, for kids to develop fluent reading skills. The double-deficit hypothesis further theorizes that children with weaknesses in both PA and RAN will have the most reading difficulty. At the core of this debate is the understanding that there are many interrelated brain processes necessary for reading, and that dyslexia, as a result, has many origins. Indeed, current theories of reading, such as the double deficit hypothesis, are expanding our knowledge about the multiple cognitive factors that influence reading skill. Contemporary research continues to shed light on the relationship among these important skills and has identified PA and RAN as some of the best predictors of reading acquisition. As this research continues, we will continue to learn more about the unique learning profile of each of our students, and be able to better target interventions that meet the individual needs of our developing readers.

References:


