
Dyslexia: Learning Difficulties And Risk Factors

Dyslexia affects a child's ability to pronounce, write and spell words. Reading consists of many interconnecting elements; people are expected to connect symbols to sounds, join the sounds together to create words, interpret the words and combine them into sentences that are intelligible. Individuals with dyslexia have difficulties connecting symbols to sounds which affects all other aspects of their reading. The current definition of the term, according to Lyon, Shaywitz and Shaywitz (2003), is:

Dyslexia is a specific learning disability that is neurobiological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and back-ground knowledge. (p. 2)

Even though individuals with Dyslexia struggle with spelling and reading fluidly, they do not have a connection with a person's intelligence. Unfortunately, people with Dyslexia do not "grow out of it." It is permanent, yet through research on specific difficulties and supports, children and adults still have the potential to be successful.

Learning Difficulties

To identify dyslexia, there are three main facets: phonological weaknesses, a deficit in magnocellular function and damage to the brain. At an early age, children may exhibit traits that are easier to identify, such as difficulties in discerning which way is left or right, the month of the year and telling the difference between p, b, and d. (Raharjo, 2018, p. 128). According to the Diagnostic and Statistical Manual of Mental Disorder (DSM 5), "dyslexia is defined as a neurodevelopmental disorder characterised by impairments in decoding, word reading accuracy and fluency, and spelling (Colenbrander, Ricketts, & Breadmore, 2018)" the criteria for Dyslexia refers to specific difficulties such as, difficulty in written expression, difficulty in spelling, difficulty in comprehending a text, and inaccuracy, as well as little effort in attempting a reading (Raharjo, 2018, p. 128).

When a person has difficulties in written expressions, they usually make grammatical and punctuation errors. Someone that struggles with spelling will find it difficult to switch, add and subtract consonants and vowels. If a student struggles in understanding a text, they may be able to read it well, but not understand the deeper meaning and other thematic elements beyond surface level observations. If a student shows little effort, they may have difficulty hearing the words or may guess them entirely when reading aloud (Raharjo, 2018, p. 129). According to one study (Sorádová & Krá?ová, 2018), the majority of people have phonological difficulties and are likely to have trouble with learning a new language, particularly with reading, writing, and improving phonology. Learners with dyslexia will most likely struggle with segmenting and blending words into sounds (Sorádová & Krá?ová, 2018). Some learners may have difficulties remembering spoken words and recovering them from their long-term memory.

In addition to these, some learners may also suffer from disorders such as ADHD and ADD, dyspraxia or dyscalculia (Sorádová & Krá?ová, 2018). Since these children find reading difficult, they may have less exposure to written works; this prevents the development of word fluency and automaticity as well as lessens exposure to higher-level grammar and vocabulary. According to one source (), morphology may have a relation to early reading instruction; children struggling with their morphological skills may also see difficulties in spelling and reading (Colenbrander, 2018). Not every learner is the same' meaning that their symptoms will range in their severity; this contributes to their individual educational needs and approach to lesson content.

Background Information

In 1676, German physician, Johannes Schmidt noticed one of his patients suffered from a stroke. Although the recovery of the patient was quick, the patient showed difficulties in reading and writing. Based on his observations, Dr. Schmidt believed that there was an unknown area in the brain responsible for language skills and damage to it would lead to disabilities in writing and reading. In 1887, German neurologist, Adolph Kussmaul called for the study of reading issues as a type of learning difficulty (Mahmoodi-Shahrehabaki, 2018). He called reading difficulties "word blindness," a term which appealed to educators and doctors; the term was used in medical journals as a type of neurological disorder. Rudolf Berlin was the first person to coin the term, "dyslexia" in his paper the same year as Kussmaul. However, Berlin's term was not accepted on a grand scale until the 1980s (Mahmoodi-Shahrehabaki, 2018).

In addition to the interest in word blindness and writings in medical journals, a report conducted by Dr. Joseph Dejerine was published in the *Lancet Medical Journal* in 1891; his report included reading difficulties of a patient he observed suffering from brain trauma. He discovered that a person's symptoms may vary greatly depending on age and conditions experienced. Dejerine also found that his patient struggled with speaking and writing (Mahmoodi-Shahrehabaki, 2018). His conclusion was that the neurological damage in the brain caused the patient's linguistic problems. . The hypothetically neurological (or medical) models of Kussmaul and Dejerine continued to be extensively adopted by researchers for about a century (Mahmoodi-Shahrehabaki, 2018).

During the late 19th century, reading difficulties were considered results of neurological disorders; this conclusion did not have supporting research and there was no universal agreement between researchers. Dr. Samuel Orton, An American neurologist, proposed the term, "strephosymbolia" referring to the the learning disorder for symbols that appear to be reversed. Afterwards, he coined the term, "developmental alexia," or the inability to learn to read. In the 1930s, "dyslexia" was a term indicating a reading disability; both Greek words for 'days,' and 'lexia' are for absence and language respectively (Mahmoodi-Shahrehabaki, 2018). Children with reading and writing disorders continued to be investigated through intelligence measurement methods used by psychologists until the 1970s. Subsequently, investigation of reading and writing difficulties started to be conducted and evaluated from an educational outlook; it was discovered that children had various needs depending on the age and grade. This research on dyslexia led to changes in education for children with reading difficulties (Mahmoodi-Shahrehabaki, 2018).

Identifying Dyslexia

The goal of early identification is to locate as many children that are at-risk as possible. According to one study (Colenbrander, Ricketts, & Breadmore, 2018), methods have to be specific, yet sensitive to each student. If they are not specific, a misdiagnosis may occur resulting in wasted time and time and money on students that do not need that exact support. Methods need to be sensitive so that children do not go undiscovered; moreover, depending on a child's age and schooling, children may be more or less responsive to certain methods of identification. It is beneficial to identify a child as early as possible; before formal schooling, it may be difficult to trust measurements taken for a child. Pre-school education is an appropriate time to begin this process to determine the likelihood of a reading difficulty in a child (Colenbrander, et al., 2018).

Risk Factors

Children do not usually have one risk factor related to their reading difficulties; it is usually a combination of factors, such as genetic, environmental, etc. If there is a greater number of factors or if they are severe, a child will be more likely to develop word reading issues. The potential risk factors are: genetic, oral language, vocabulary knowledge, morphological awareness, hearing, and speech sound disorders (Colenbrander, et al., 2018). If a child has a family member who has a reading disability, they are at a greater risk at also developing a reading disability than a child without a family member who does not. According to a study, "40-66%... develop reading difficulties themselves, as compared with 6-14%" that do not have a family member with a reading difficulty (Colenbrander, et al., 2018).

Children that have oral language skills that are proper for their age are less likely to develop a reading difficulty. When a child is first starting to learn to read and spell, they need to learn how sounds relate to their letters; the combination of segmenting, sound mappings, and blending is known as phonics (Colenbrander, et al., 2018). Once developed, a child has multitude of pronunciations and spellings in their brain. Thus, if a child can blend, they can teach themselves to read words that they have not seen before. Phonemic awareness is the ability to pay attention to, reflect on, and understand the individual sounds in each word. A student's skill in phonemic awareness is a good predictor of difficulty or success with reading. Phonological difficulties are not always enough to cause dyslexia unless they are paired with other risk factors. Letter knowledge is another potential risk factor; a child needs to be aware of letter names and sounds to learn phoneme-grapheme connections (Colenbrander, et al., 2018).

According to one source, a poor vocabulary knowledge is related to poor reading comprehension; however, it depends at what stage of formal schooling they are (Colenbrander, et al., 2018). A student's oral vocabulary knowledge in pre-kindergarten or kindergarten is not a definitive predictor of their future abilities; progress in later years of elementary schooling are a stronger indicator of this ability. Children with dyslexia are show signs of weak morphological skills; morphology is the study of words, formation of words, and relationships with other words. There is research to support that morphological skills relate to reading and writing skills; however, there are still debates on whether formal elementary reading instruction should include lessons in morphology (Colenbrander, et al., 2018).

Difficulties in hearing are a strong indicator in early identification of reading difficulties; it impacts other skills such as vocabulary and phonological skills. On average, children that are deaf are approximately three years behind their grade level by the end of elementary school. Children

that are affected by temporary hearing loss may also be affected. Children affected by glue ear, unilateral deafness, or mild-to-moderate deafness are all at risk of developing a reading difficulty. However, a child affected by fluctuating and mild-to-moderate hearing loss are at a lower risk of developing language and vocabulary difficulties compared to those with profound deafness (Colenbrander, et al., 2018). Nevertheless, all levels of hearing loss should be considered a potential risk factor.

A child with a speech-sound disorder, excluding difficulties caused by motor, sensory or physical conditions is at a greater risk of developing a reading difficulty. However, a child with a speech-sound disorder is at a greater risk of developing spelling and reading difficulties if they have another language difficulty altogether or if someone in their family had a reading issue (Colenbrander, et al., 2018). Lastly, other factors related to reading skills are short-term memory, working memory, executive functioning, and rapid automatic naming. Rapid automatic naming is a person's ability to recognize and call aloud a series of items in front of them, including colors and letters. One risk factor is not enough in determining if a child has a reading difficulty. Stronger evidence is related to the amount of risk factors and the severity of them as a child is developing (Colenbrander, et al., 2018)..