



Dyslexia

Dyslexia is a language-based learning disability that is characterized by difficulties in word recognition, decoding, and spelling due to problems identifying speech sounds and learning how to relate to letters and words, and affects areas of the brain that process language.

Etiology

Dyslexia is a genetic disorder linked to certain genes that affect how the brain processes reading and language. Premature birth or low birth rate may also increase the chances of dyslexia. Moreover, certain risk factors of dyslexia are environmental, such as exposure during pregnancy to nicotine, drugs, alcohol or infection that may alter brain development in the fetus.

Onset

The earliest signs of dyslexia emerge around 1 to 2 years of age when children first learn to make sounds. Children who don't say their first words until 15 months of age or their first phrases until 2 years of age have a higher risk of developing dyslexia.

Symptoms

Dyslexia is most commonly noticed and diagnosed in school aged children, or when children begin to learn how to read.

Prevalence

Dyslexia occurs in people of all backgrounds and intellectual levels. Dyslexia occurs in at least one in 10 people, putting more than 700 million children and adults worldwide. Additionally, as many as 15-20% of the US population suffers from symptoms of dyslexia.

Though, there are several signs before children attend school that may indicate a problem. The severity of dyslexia varies from person to person.



Signs (Mayo Clinic):	
Before School	School Age
<ul style="list-style-type: none">○ Late talking○ Learning new words slowly○ Problems forming words correctly, such as reversing sounds in words or confusing words that sound alike○ Problems remembering or naming letters, numbers and colors○ Difficulty learning nursery rhymes or playing rhyming games	<ul style="list-style-type: none">○ Reading well below the expected level for age○ Problems processing and understanding what he or she hears○ Difficulty finding the right word or forming answers to questions○ Problems remembering the sequence of things○ Difficulty seeing (and occasionally hearing) similarities and differences in letters and words○ Inability to sound out the pronunciation of an unfamiliar word○ Difficulty spelling○ Spending an unusually long-time completing tasks that involve reading or writing○ Avoiding activities that involve reading

Twice Exceptionality (2e) and Dyslexia

“Twice Exceptional” is a term used to refer to individuals with one or more disabilities presenting alongside one or more exceptional strengths.

Some broad characteristics of highly gifted children overlap with characteristics of students with Dyslexia. For example, many individuals with Dyslexia exhibit traits such as advanced verbal vocabulary, fluid reasoning and nonverbal problem solving. Students with Dyslexia are often considered creative problem-solvers and referred to as out-of-the-box thinkers.

Physiology

People with dyslexia experience a different distribution of metabolic activation and failure to the left hemisphere rear brain systems to function properly during reading. Moreover, there is a greater activation in the lower frontal areas of the brain. Studies have found that individuals with dyslexia have less gray matter in the left parietotemporal area, which could lead to problems processing the sound structure of language. It has been indicated that there is less white matter in the same area, which could lessen the ability or efficiency of the region of the brain to communicate with one another.



Dyslexia and Working Memory	Dyslexia and Executive Function
<p>Working memory helps an individual hold information in their brain to use in the short term, focus on a task and remember what to do next. If a student has impairments in working memory, they may have trouble remembering and following directions, computing problems in their head or retrieving information from memory when they need it.</p> <p>Learning to read relies on working memory. We must match each letter with the correct sound, put it together, and remember it for future use.</p> <p>The process of keeping multiple sounds and letters active is often too difficult for many individuals with dyslexia because they have poor auditory working memory. This means that they struggle to hold all the sound units in their head, which makes it hard for them to read.</p> <p>Poor working memory in individuals with dyslexia also makes it difficult to remember the sequence of information that is presented out loud, such as instructions, new vocabulary words, and even names.</p>	<p>Executive Function refers to the set of mental skills that help to perform tasks such as planning, prioritizing, initiating, organizing, paying attention to and remembering details, monitoring and self-regulation and controlling emotional reactions.</p> <p>Research has shown strong correlations between dyslexia symptoms and deficits in working memory and executive functioning.</p> <p>The ability to shift approaches and to synthesize information in novel ways is essential for effective reading, writing, note-taking, studying, and test-taking. When students with dyslexia need to coordinate the skills involved in tasks required by school, they often cannot produce the required outcome. These students often struggle with reading and writing demands because their weaknesses in the core executive function processes affect their accuracy, efficiency, and overall productivity.</p>

Treatment/Services Available

Early identification and intervention are critical to helping children with dyslexia. Teachers, therapists, and any other professionals working with the child are highly encouraged to collaborate and to teach the children using a systematic and explicit method that involves several senses at the same time. Individuals with dyslexia often need structured practice and immediate, corrective feedback to develop automatic word recognition skills. Schools should also get involved by implementing academic accommodations and modifications to help students with dyslexia.

Dyslexia and COGx

Students with Dyslexia often present with difficulties in one or more of the processing skills – attention, working memory, processing speed. The COGx approach to cases of dyslexia is to strengthen any weaknesses in the processing skills using science-based exercises, while teaching the student about the skills and their learning process. As the student’s skills, awareness and stamina develops, they are better able to make progress in speech therapy and reading remediation programs, which they can do concurrently or after COGx



References and Additional Resources:

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