

# Dyslexia

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Dyslexia is a learning disorder that disrupts how the brain processes written language. Individuals with dyslexia encounter challenges in reading and related skills. Dyslexia is not attributed to problems with intelligence, hearing, or vision. The disorder involves difficulty reading due to problems identifying speech sounds and learning how they relate to letters and words (decoding). Dyslexia comes in developmental or acquired forms, with various symptoms persisting into adolescence and adulthood. It tends to run in families, suggesting a genetic basis linked to specific genes influencing brain processes related to reading and language.

## Causes:



Dyslexia results from individual differences in the parts of the brain that enable reading. It is linked to certain genes, including DCDC2, DYX1C1, KIAA0319, and ROBO1, affecting how the brain processes reading and language. These genes are associated with brain development and the formation of neural circuits involved in language processing. Dyslexia is thought to arise from disruptions in the normal functioning of these genes, impacting the development and organization of neural pathways crucial for fluent reading. The disorder can be either developmental or acquired, with acquired dyslexia occurring following neurological insult, such as traumatic brain injury or stroke. While the signs and symptoms of acquired dyslexia overlap with the developmental form, they require different treatment methods. Additionally, pure alexia, a form of acquired dyslexia, constitutes a distinct category within this group. The interplay of genetic factors and neurological conditions contributes to the development of dyslexia, and a family history of dyslexia or other reading and learning disabilities increases the risk of its occurrence.

## Symptoms:

- Delayed onset of speech
- Lack of phonological awareness
- Difficulty in identifying or generating rhyming words
- Challenges counting the number of syllables in words
- Struggles with segmenting words into individual sounds
- Difficulty blending sounds, indicating reduced phonemic awareness
- Problems with word retrieval and naming things
- Poor spelling (dysorthographia or dysgraphia)
- Slow and labor-intensive reading and writing
- Avoidance of activities that involve reading



## Treatments:



Through the use of compensation strategies, therapy, and educational support, individuals with dyslexia can learn to read and write. There are techniques and technical aids that help manage or conceal symptoms of the disorder. Reducing stress and anxiety can sometimes improve written comprehension. Dyslexia intervention with alphabet-writing systems aims to increase awareness of correspondences between graphemes (letters) and phonemes (sounds), relating these to reading and spelling by teaching how sounds blend into words. Reinforced collateral training focused on reading and spelling may yield longer-lasting gains than oral phonological training alone. Early intervention is critical for reducing reading failure, and research does not suggest that specially-tailored fonts significantly help with reading. While there is limited evidence regarding the impact of music education, some interventions like atomoxetine may also be helpful for dyslexic individuals.

## References:

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