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Editorial

Advances in the Treatment of Dyslexia

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Developmental dyslexia is a complex neurodevelopmental disorder that can affect reading skills, necessitating important global research efforts to enhance its diagnosis and management. These transformative developments promise a new chapter for dyslexia treatment as renewed hope sparked earlier this month in the form of a flurry of eye research and technology innovation. Recent progress in understanding these concepts will be reviewed in the following paragraphs, with an emphasis on barreling through this process from the vision science/optometry perspective, as explored in this editorial.

One area of focus is foveal crowding, or how the spacing of letters and words interferes with recognition when the reader reads. Sequential information retrieval may ideally be supported by applying crowding effects counteracting visual therapies leading to improved reading speed and accuracy [1]. Additionally, eye-tracking technology has become critical in diagnosis as it can detect abnormal saccadic movements and gaze patterns which can be used for individualized treatment [2].

Neurofeedback interventions have also indicated efficacy for improvements in attention and cognitive control in individuals with dyslexia and attention issues. Within the context of reading exercises and guided by the International Classification of Function and Disability-Child and Youth (ICF-CY) model, these interventions resulted in notable reading performance improvements [3]. Moreover, genetic and molecular research advances have also discovered how some environmental conditions and reading disability-susceptibility genes (such as DCDC2 and DNAAF4) impact reading disability, along with potential routes towards personalized therapies [4,5].

On the other hand, technology tools, including speech-to-text systems and assistive software, can be successful in improving reading comprehension and supporting writing skills among dyslexic students [6]. Moreover, complex games that focus on addressing rhythmic abilities have been shown to effectively treat phonological deficits through motor coordination and auditory exercises [7]. They move away from traditional forms of learning and intervention.

Additionally, structural changes in the cingulo-opercular network related with reduced reading fluency in the children with dyslexia have been reported [8] using cortical thickness and brain connectivity [8] analyses. Imaging biomarkers identified from these studies have since led to interventions based on sensory integration and executive function-based reading programs [9].

One of the most not able and "revolutionary" discoveries to emerge from dyslexia research is color perception differences. Research by Dr. Sandra Stark regarding substantial disparity of photoreceptors in terms of dyslexics and non-dyslexics, along with fact that dyslexics have a 75% red and 20% green foveal ratio, shows that this does have effect on performance of near vision tasks [10] and dyslexia symptoms. This finding accounts for dyslexics' increased ability to perceive direction of motion when using blue compared to green gaps in dynamic optotype measurements (Dyop), and provides importantly associated information for visual therapies [10]. Further validating Dr. Stark's research, studies by Dr. Isiaka Sanni indicated that Dyop color perception could be potentially diagnostic in evaluating dyslexia-related symptoms, as well as migraines and ADHD-related conditions [11]. In addition, Professor Paul Harris reported that glasses are not sufficiently therapeutic for conditions such as migraines and dyslexia compared to the effectiveness of tinted contact lenses [12]. This difference can be traced back to the difference between contact lenses, which tint the entire visual field and therefore provide increased and more stable vision, and eyeglasses that at most affect the central vision field [12].

As ever, the key to effective management is early detection. This technology has the potential to be integrated into large-scale screening programs, examples are dysDiTect, a program employing machine learning to capture dyslexia during Chinese dictation tasks [5]. Dyslexia management has increasingly become more holistic and effective by combining traditional optometric science with new technical developments.

Dyslexia management continues to evolve, emphasizing the need for interdisciplinary approaches, taking advantage of advancements in technology, and focusing on personalized care. Vision-based therapies play an important role alongside neuroplasticity-driven-based interventions to facilitate reading rehabilitation. These tools and approaches will continue to evolve and we look forward to seeing more inclusive educational environments and improved quality of life for those who have dyslexia.

Bibliography

1. Liu WJ., *et al*. "Crowding accompanied by fovea in children suffering from developmental dyslexia". *Annals of Dyslexia* (2024).
2. Nguyen TKC., *et al*. "Eye tracking as a support for those with dyslexia: a review". *D Disability and Rehabilitation: Assistive Technology* (2024).
3. Joveini G., *et al*. "Neurofeedback intervention for dyslexia disorders: A systematic review". *Applied Neuropsychology Child* (2024).
4. Rinne N., *et al*. "Susceptibility genes for developmental dyslexia DNAAF4|DCDC2|NRSN1". *Cerebral Cortex* (2024).
5. Liu HW., *et al*. "DysDiTect: A novel dyslexia identification method based on CNN-Positional-LSTM-Attention model with Chinese dictation task". *Brain Science* (2024).
6. Almgren Bäck G., *et al*. "Experiences of dyslexic students in the turn to assistive technology in support of written language skills: a five years follow-up". *Disability and Rehabilitation: Assistive Technology* (2024).
7. Vonthron F., *et al*. "A serious game to train rhythmic abilities in children with dyslexia: feasibility and usability study". *JMIR Serious Games* (2024).
8. Horowitz-Kraus T., *et al*. "Localized differences (alterations) in cortical thickness and sulcal depth of the cingulo-opercular network associated with lower reading fluency". *Brain Research* (2024).
9. Farah R., *et al*. "Executive-functions-based reading training leads to greater integration of sensory-motor systems during reading fluency in children with dyslexia". *Cerebral Cortex* (2024).
10. Stark S and Optom B. "A comparison of Dyop color perception and dyslexia diagnosis". Consulting services customized to your specific needs.
11. Sanni IO and OD M. "Use of Dyop colors test for color acuity assessments". Visual considerations in managing the dizzy patient: a case series.
12. Harris P and OD FCOVD. "Relieve migraines with tinted lenses". *Optometry Times* 7.2 (2015): 30.