



The Under-Achieving Child

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In short, behavioural Optometrists do not treat dyslexia in children and adults. This is clearly stated in policies and publications of Optometry Australia, the Australasian College of Behavioural Optometrists, the American Academy of Optometry, and the American Optometric Association. Psychologists test for and diagnose dyslexia.

However, a behavioural optometrist will test, diagnose and manage any visual dysfunction that may also co-exist with the diagnosis of dyslexia, which may interfere with the process of reading and writing, as well as limiting the potential benefits of other therapies for the dyslexia.

A full assessment performed by behavioural optometrists may identify vision problems which can affect reading speed, fluency, concentration and comprehension. By identifying and treating the visual problem, often reading speed and comprehension improve without direct reading instruction. However, the primary concern of all optometrists are their patient's visual problems. Optometrists only treat the concurrent visual problems which affect reading and are not treating the dyslexia. This is a common misconception amongst critics of behavioural optometry. It may be that on occasions the results of an optometric examination are suggestive of dyslexia, and the optometrist would make an appropriate referral for further assessment.

Consistent with the behavioural optometry approach to this population, the American Academy of Optometry issued a comprehensive review in 2013. The position paper reviews recent studies providing new insights into accommodative and vergence



disorders that reinforce the need for comprehensive eye examinations and follow-up care for students who are struggling in school. It notes that the typical student with an accommodative or binocular disorder will often experience fatigue, loss of place when reading, decreasing comprehension over time, and difficulty completing assignments. These difficulties may not fit exclusively into the currently accepted categories of problems that adversely impact a student's school performance such as a specific learning disability, attention deficit hyperactivity disorder (ADHD), or language-based dyslexia. The position paper concludes that timely identification and treatment of eye focusing and teaming problems can remove a potential obstacle that may restrict a child from performing at his or her full potential ¹. It is widely acknowledged that causes of underachievement are multifactorial.

Evidence for this is amply provided in another Clinical Practice Guideline from the American Optometric Association on Care of the Patient with Learning Related Vision Problems. This compilation of 205 references concludes that vision problems, comprising deficits in visual efficiency and visual information processing, have a relatively high prevalence in the population, and can interfere with the ability to learn. These deficits may cause clinical signs and symptoms that range from asthenopia and blurred vision to delayed learning of the alphabet, difficulty with reading and spelling, and skipping words and losing place when reading. They respond favorably to the appropriate use of lenses, prisms, and vision therapy, either alone or in combination ².

Regarding specific conditions associated with under-achievement, such as ADHD, in their journal article offered for continuing education credit by the California Optometric Association, Hong and Press identify the role of visual factors in various childhood behavioral disorders. Included in this is a rationale for the impact of vision disorders on ADHD ³.



Even when accommodation and vergence are normal, eye movement abnormalities can occur with dyslexic children which contribute to their reading difficulties. In studying this relationship, Tiadi and colleagues published credible evidence that dyslexic children exhibit many more difficulties of control of saccades during fixation than age-matched non-dyslexic children. They concluded that orthoptic as well as visuo-attentional training in dyslexic children could help them to better focus their attention and therefore decrease reading errors and/or word omission ⁴.

Behavioural optometry has never taken the stance that vision is an underlying cause of dyslexia, but it is common clinical experience, and there is now strong published evidence, that children in this group have a higher incidence of visual dysfunction than the general population, once again highlighting the dangers of relying on outdated meta-studies.

The role of abnormalities in visual attention and its influence on reading has mushroomed in the last ten years. For instance, Facchetti's laboratory in Italy has established a causal link between visual spatial attention and reading acquisition. They conclude: "Independent of speech-sound perception, as well as non-alphabetic cross-modal mapping skills, visual attentional functioning predicts future reading emergence and development disorders. These findings virtually close not only a long-lasting debate on the causal role of visual spatial attention deficits in dyslexia but also open the way to a new approach for early identification and more efficient prevention of dyslexia ⁵.

Much of the evidence points toward vision playing a more prominent role in dyslexia. A particularly compelling paper by Vidayasagar and Pammer argues that attentional mechanisms controlled by the dorsal visual stream help in serial scanning of letters, and that any deficits in this process will cause a cascade of effects, including impairments in visual processing of graphemes, their translation into phonemes and the development



of phonemic awareness. This view of dyslexia localizes the core deficit within the visual system and supports the role of optometry in early detection and intervention ⁶.

Research continues to point toward untreated visual abnormalities as a risk factor in the development of dyslexia. A study by Ortiz and colleagues in Spain compared children from preschool with and without risk for dyslexia in auditory and visual temporal order judgment tasks. Results revealed that the visual as well as the auditory perception of children at risk for dyslexia is impaired. The difficulties of children at risk in visual and auditory perceptive processing affected both linguistic and nonlinguistic stimuli. They concluded that these visual and auditory perceptual deficits reflect a basic temporal processing deficit contributing to the failure to learn to read, rather than being the consequence of reading difficulties ⁷.

Creavin et al (2015)⁸ studied 172 children with severe reading impediment (SRI) and found that 2 in 10 children with dyslexia have proven vision problems. Abnormalities in sensory fusion at near were higher in children with SRI compared with their peers (1 in 6 vs 1 in 10), as were children with stereo acuity worse than 60 seconds of arc (1 in 6 vs 1 in 10). There may not be a direct association between dyslexia and vision problems, but children with dyslexia have at least the same if not greater incidence of vision dysfunction than the general population. In fact, the Creavin study demonstrates that dyslexic children have vision problems that occur **50% more frequently** than in the general population.

In the UK, where the Creavin paper population was based, there are 375,000 children with dyslexia and 60,000 with dyslexia have associated vision problems, according to the study. With these rates of concurrent visual dysfunction, it would logically follow that a visual assessment should be part of assisting a child who has indications of, or has been diagnosed with dyslexia.



To quote Evan Brown, in a study in process, *“Clinically, primary care optometrists are frequently consulted by parents and teachers of children and teenagers underperforming in literacy achievement, looking to eliminate vision as a contributing factor. Standard primary care assessment limited to visual acuity, ocular health and refractive error are unlikely to uncover a visual dysfunction related to learning as these ocular conditions only have weak correlations to academic performance^{9 10.}”*

When considering refractive error, hyperopia has been shown to have the strongest association with decreased reading performance^{11 12 13.}

To adequately answer the question of whether a vision problem exists, that may be contributing to a learning difficulty, the literature suggests best practice involves a full survey should be conducted of visual efficiency skills, also known as functional vision skills (oculomotor function, binocular and accommodative function) and visual information processing skills (visual perception abilities and visual-motor integration abilities)”. Optometric treatment of functional visual skills dysfunction has a very strong evidence basis, as summarised by Ciuffreda^{14.}

References

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