



American Academy of Optometry
Binocular Vision, Perception, and Pediatric Optometry

Position Paper on Optometric Care of the Struggling Student For parents, educators, and other professionals

August 2013

Recent studies have provided new insights into disorders of eye focusing (accommodation) and eye teaming (vergence) that reinforce the need for comprehensive eye examinations and follow-up care for students who are struggling in school.¹⁻¹¹ These disorders may occur even when individuals have 20/20 eyesight, and can impact students when reading and studying. The typical student with an eye focusing or eye teaming disorder will often experience fatigue, loss of place when reading, and difficulty completing assignments.¹⁻⁴ Other common symptoms include skipping small words, rereading sentences, inserting words that do not exist in the text, and experiencing decreasing comprehension the longer that he or she reads.^{1,2,5} (See Box 1 for an example). Teachers and parents are often at a loss to explain the source of a student's problems. The difficulties that they observe 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. Parents, teachers and other professionals often have several common questions when seeking information about disorders of eye focusing and eye teaming.

How common are eye focusing and eye teaming problems?

Recent studies suggest that 5-10% of school-aged children have an eye teaming or eye-focusing problem.^{6,7,12} Some children report significant symptoms while others experience minimal symptoms. Vision testing that emphasizes a child's ability to read letters on a distance eye chart does not test for eye focusing or eye teaming problems. Even if a child is able to see the 20/20 letters, he or she may have a problem with eye focusing or eye teaming. Additionally, studies have shown that a significant number of students who pass a vision screening for eyesight (ability to see 20/20) have a disorder of eye focusing or eye teaming.^{7,12}

When should a student have an eye examination?

The American Optometric Association recommends that school-aged children who have no symptoms have a comprehensive eye examination performed by an eye care professional every two years, while children who have symptoms or are at additional risk for vision problems be examined annually or as recommended.¹³ This examination should assess visual acuity (ability to see clearly), refractive status (the need for glasses or contact lenses to see clearly), health of the eyes, as well as eye focusing and eye teaming skills.

Will all eye examinations identify problems with eye focusing or eye teaming skills?

Eye care providers, like other health care professionals, typically use a problem-based approach, yet some may not provide an expanded assessment of eye focusing or eye teaming, especially in cases where the patient does not report specific symptoms. When the parent or student tells the eye doctor that there are difficulties with school performance and requests a comprehensive vision assessment, it is important that the eye doctor perform a thorough evaluation of eye focusing and eye teaming or refer the patient to another doctor who provides this form of care.

What will I observe if my child has eye focusing or eye teaming problems?

Students will often complain of eyestrain, fatigue, blur, words moving, headaches, or loss of place when reading and studying.^{1,2,5,7} Parents and teachers may observe behavioral problems affecting school performance such as inattention, avoiding reading and studying, making careless mistakes, and difficulty finishing assignments.^{4,8} Visually-related complaints reported by students and their parents are more common in children with eye focusing or eye teaming problems than in those with normal visual skills.^{2,4} However the absence of symptoms may be due to avoidance, or lack of awareness on the part of a child as to what it feels like when there is visual stress. Some children who experience symptoms may not complain, because they assume that this is normal.

How are the problems in eye focusing and teaming treated?

Numerous studies have indicated that specific treatment of eye focusing and teaming problems results in a reduction of symptoms and improvement in visual function.^{6,9,10,14} In fact, a recent study showed functional neurological changes following treatment with vision therapy for a common eye teaming problem.¹⁵ Treatment can include lenses, prisms, or vision therapy. If a student's problems with eye focusing or eye teaming are found during the eye examination, the intervention program should include a follow-up evaluation to monitor the student's vision status and to ensure that the intervention is successful. Three recent randomized clinical trials have investigated treatments for a common eye teaming problem called convergence insufficiency.^{21,22} These studies have shown that office-based treatment with vision therapy is significantly more effective than home-based treatment and that improvement is maintained for at least one year.^{9,11,16,23} Some studies have suggested that treatments for eye teaming problems can result in improvements in academic performance such as, reading comprehension, fluency and speed, and attention.¹⁷⁻²⁰ Parents should discuss treatment options with the eye care provider and understand the advantages and disadvantages of different treatment modalities.

Do all children with vision problems have a learning disability, attention deficit disorder, or dyslexia?

Vision problems can affect students with learning disabilities, language-based dyslexia, or ADHD as well as students without these conditions. Students with learning, reading, or attention problems typically have several factors that impact school performance. Vision problems may be one of these factors and should be treated in these students. Treatment of the vision condition is not intended to cure the learning disability, ADHD, or dyslexia. Instead, the treatment is designed to remove obstacles to efficient learning. For example, if a nearsighted (difficulty seeing far away) student with learning problems had difficulty copying from the board and wearing glasses eliminated this difficulty, it would be clear that the glasses did not “cure” the learning problem; instead, the glasses eliminated a visual obstacle to learning. Similarly, if a student with a reading problem experienced difficulty concentrating on the text due to an eye teaming problem, and concentration improved through glasses, prism, or vision therapy, the treatment did not “cure” the reading disability. Rather, the student was able to sustain concentration comfortably and efficiently thereby benefitting more fully from educational remediation.

SUMMARY

In summary, recent research has clearly shown that problems in eye focusing and eye teaming are common in students and should be evaluated, especially in children who are struggling in school. If a problem is found, then effective treatment should be prescribed. 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.

Box 1 An example of a student with an eye teaming problem with 20/20 eyesight who did not need glasses or contact lenses.

Zach is a nine-year old child who was struggling in the first few months of third grade. His teacher noticed him rubbing his eyes during classroom work and he was often the last child to finish his work. He regularly asked to go to the school nurse because of headaches. His teacher also noticed that his oral reading was choppy, although he seemed to be able to decode words and was a good speller. His teacher asked the school nurse to do a vision screening. The school nurse reported that Zach had 20/20 eyesight in each eye, but she recommended that he have an eye exam because of his headaches. His parents took him to an eye doctor recommended by their pediatrician who reported that Zach's eyes were healthy and that he didn't need glasses. Another health care provider suspected that allergies were the cause of Zach's headaches and suggested allergy testing. As the year progressed, Zach's classroom performance continued to deteriorate. His parents and teacher were concerned about his low reading comprehension score on the mid-year standardized test. Homework was becoming very difficult and Zach became very reluctant to read at home. After his teacher advocated for a second opinion, his parents took Zach to an optometrist who diagnosed him with an eye teaming problem called convergence insufficiency and prescribed optometric vision therapy. Zach received four months of office-based vision therapy supplemented with assigned home therapy, and his parents and teacher noticed significant changes. Of note, he completed his classroom work and homework much faster, no longer rubbed his eyes, read willingly at home and enjoyed it, and his headaches were gone. Nothing had changed in his curriculum or his overall health, but Zach was a more engaged and successful student after the visual problem was resolved.

NOTICE: *This report is furnished for general information purposes only. It does not constitute the practice of optometry or medicine, nor should it be relied upon for dealing with a specific, individual medical or health condition. Please consult a qualified eye care professional for advice about a specific condition.*

References

1. Barnhardt C, Cotter SA, Mitchell GL, Scheiman M, Kulp MT, Group CS. Symptoms in children with convergence insufficiency: Before and after treatment. *Optom Vis Sci* 2012; 89:1512-20.
2. Borsting E, Rouse M, Mitchell G, et al. Validity and reliability of the revised convergence insufficiency symptom survey in children ages 9-18 years. *Optom Vis Sci* 2003;80:832-8.
3. Chase C, Tosha C, Borsting E, Ridder W. Visual discomfort and objective measures of static accommodation in college students. *Optom Vis Sci* 2009;86:883-89.
4. Rouse M, Borsting E, Mitchell GL, et al. Academic behaviors in children with convergence insufficiency with and without parent-reported ADHD. *Opt Vis Sci* 2009;86:1169-77.
5. Sterner B, Gellerstedt M, Sjoström A. Accommodation and the relationship to subjective symptoms with near work for young school children. *Ophthalmic Physiol Opt* 2006;26:148-55.
6. Abdi S, Rydberg A. Asthenopia in schoolchildren, Orthoptic and ophthalmological findings and treatment. *Doc Ophthalmol* 2005;111:65-72.
7. Borsting E, Rouse MW, Deland PN, et al. Association of symptoms and convergence and accommodative insufficiency in school-age children. *Optometry* 2003;74:25-34.
8. Borsting E, Rouse M, Chu R. Measuring ADHD behaviors in children with symptomatic accommodative dysfunction or convergence insufficiency: A preliminary study. *Optometry* 2005;76:588-92.
9. Convergence Insufficiency Treatment Trial (CITT) Study Group. Randomized clinical trial of treatments for symptomatic convergence insufficiency in children. *Arch Ophthalmol* 2008;126:1336-49.
10. Scheiman M, Cotter S, Kulp MT, et al. Treatment of accommodative dysfunction in children: Results from a randomized clinical trial. *Optom Vis Sci* 2011;88:1343-52.
11. Scheiman M, Mitchell L, Cotter S, et al. A randomized clinical trial of treatments for convergence insufficiency in children. *Arch Ophthalmol* 2005;123:14-24.
12. Rouse M, Borsting E, Hyman L, et al. Frequency of convergence insufficiency among fifth and sixth graders. *Optom Vis Sci* 1999;76:643-9.

13. The American Optometric Association Consensus Panel on Pediatric Eye and Vision Examination. *Pediatric Eye and Vision Examination*. 2nd ed. St Louis, MO: American Optometric Association; 2002.
14. Sterner B, Abrahamsson M, Sjostrom A. The effects of accommodative facility training on a group of children with impaired relative accommodation--a comparison between dioptric treatment and sham treatment. *Ophthalmic Physiol Opt* 2001;21:470-6.
15. Alvarez TL, Vicci VR, Alkan Y, et al. Vision therapy in adults with convergence insufficiency: clinical and functional magnetic resonance imaging measures. *Optom Vis Sci* 2010;87:E985-1002.
16. Scheiman M, Mitchell GL, Cotter S, et al. A randomized clinical trial of vision therapy/orthoptics versus pencil pushups for the treatment of convergence insufficiency in young adults. *Optom Vis Sci* 2005;82:583-95.
17. Atzmon D, Nemet P, Ishay A, Karni E. A randomized prospective masked and matched comparative study of orthoptic treatment versus conventional reading tutoring treatment for reading disabilities in 62 children. *Bin Vis Eye Muscle Surg Q* 1993;8:91-106.
18. Dusek WA, Pierscionek BK, McClelland JF. An evaluation of clinical treatment of convergence insufficiency for children with reading difficulties. *BMC Ophthalmol* 2011;11:21.
19. Stavis M, Murray M, Jenkins P, Wood R, Brenham B, Jass J. Objective improvement from base-in prisms for reading discomfort associated with mini-convergence insufficiency type exophoria in school children. *Binocul Vis Strabismus Q* 2002;17:135-42.
20. Borsting E, Mitchell GL, Kulp MT, et al. Improvement in academic behaviors after successful treatment of convergence insufficiency. *Optom Vis Sci* 2012;89:12-8.
21. Scheiman M, Gwiazda J, T L. Non-surgical interventions for convergence insufficiency. *Cochrane Database of Systematic Reviews* 2011, Issue 3. Art. No.: CD006768. DOI: 10.1002/14651858.CD006768.pub2.
22. Lavrich JB. Convergence insufficiency and its current treatment. *Curr Opin Ophthalmol* 2010;21:356-60.
23. Convergence Insufficiency Treatment Trial Study Group. Long-term effectiveness of treatments for symptomatic convergence insufficiency in children. *Optom Vis Sci* 2009;86:1096-103.