



Which Vision Specialist Should See Your Child?

by David Grisham, OD, MS, FAAO

Scott impressed his teacher as an energetic 7 year old boy who wanted to do well, but he just couldn't concentrate on his reading lessons. He skipped over words, lost his place in print, and seemed to have a lot of reversal confusion with b's and d's. He fatigued quickly with a book in hand, but his mother said he could watch movies and play video games for hours. Scott was sent to the school nurse for vision screening. She found Scott to have 20/20 visual acuity with each eye when tested on a chart 10 feet away and sent him back to class with the report that a vision problem was not indicated. Just to be sure, the parents sent Scott to an ophthalmologist, a medical eye doctor, who confirmed the nurse's report of good vision. He found no significant refractive error, no strabismus, and normal eye health. The resource specialist at the school still suspected a visual tracking problem so she recommended another vision exam with an optometrist specializing in children's vision. This eye doctor reported that Scott not only had a tracking problem, i.e., couldn't move his eye accurately from one point to another, but also had a convergence insufficiency where print would double if he held the book within 8 inches of his face, which he often did. Three months of home vision therapy was recommended along with weekly office visits. Now the parents were really confused. Did Scott have a vision problem or not that affected his reading performance? They sought a third opinion at our University Eye Clinic. We examined Scott for vision acuity (he had 20/20), refractive error (normal), eye health (normal), eye tracking (immature), eye coordination or teaming (convergence deficiency), near focusing skills (deficient) and screened for a visual

perceptual dysfunction (immature visual-motor integration). We had to admit that both previous doctors were correct as far as they went with their examinations. Many parents find themselves in this situation where eye doctors seemingly disagree and the difference is often due to the depth and extent of the vision examination. Parents and teachers need to know what type of vision examination to ask for, to demand if necessary, from eye doctors.

There are three levels of vision examination that are offered by vision care practitioners. The first level is called a Primary Care or Visual Pathway Examination. This involves testing the optical performance of the eyes and establishing the health status of the visual system. All eye doctors, ophthalmologists and optometrists, measure visual acuity, check for refractive error and investigate for eye disease. Myopia or nearsightedness reduces vision at distance, but usually does not affect reading performance. In fact, superior reading is often found in nearsighted people compared to the farsighted or even those having no refractive error. Paradoxically, school vision screening is designed to find the myopes who need glasses for distant viewing, but who happen to be the best readers in class. Poor reading is associated with excessive farsightedness. Farsighted children must use their focusing power to clear up the image at distance and since they can usually do this, they do not flunk the visual acuity chart located 10 feet away. In the classroom, however, these farsighted children must constantly use excessive focusing power to read books clearly and this neuromuscular system can fatigue quickly. The eye doctor utilizes refractive techniques or drops to identify the student who

has significant farsightedness, but the school nurse will usually miss this important condition. Eye health is not usually an issue with children, except for minor infections of the lids and pink eye. I believe current school screening procedures are inadequate. Even a Primary Care Examination is insufficient and should not be considered a thorough vision examination for the child experiencing reading difficulties.

It is at the second level of investigation of the visual system that most vision problems occur which affect reading performance and comfort. Optometrists refer to this level of testing as a Visual Efficiency Examination. Besides testing for pathway integrity (first level), the optometrist also measures visual performance over time in tracking skills (smooth tracking and eye movements used in reading), convergence and divergence skills (board to book and back), near focusing amplitude and facility, and binocular fusion and depth perception. In the last 10 years, the research literature has shown the visual efficiency conditions listed in Table 1 to be much more prevalent in children having reading difficulties. Our studies at UC Berkeley have found that over half the children in remedial reading classes or special education have some visual efficiency dysfunction that can affect reading and comfort. These tracking and eye teaming conditions do not cause dyslexia, a neurologic problem, but they make reading more difficult and unpleasant than it needs to be. Common symptoms and behaviors of visual efficiency dysfunctions are listed in Table 2. Most ophthalmologists and optometrists in commercial settings do not offer this second level of testing. Ophthalmologists are simply not trained in these testing and



analysis techniques since these are not directed toward diagnosing eye disease. Commercial optometrists restrict their testing to the basics to keep costs down. Visual efficiency dysfunctions result from a mismatch between the maturity of child's visual skills and the visual accuracy and stamina required by school work, e.g., careful and accurate decoding of print, rapid copying of material from the board to paper, sustained convergence and near focusing of the eyes for a reading assignment. Our cultural requirement of at least 12 years of education has outstripped normal visual physiology for many and these kids are left behind with a sense of discomfort or dislike for sustained reading and class work. Many adult computer operators experience the same problems. Once these visual deficiencies are found, they can be easily managed with specially designed reading glasses or a short program of vision training that can improve eye tracking, teaming, and

focusing. The optometrist who specializes in children's vision or developmental vision is probably the best professional to complete a Visual Efficiency Examination and to deliver follow up care, but most recently graduated optometrists can perform this examination on request.

A third level of vision examination looks at the meaning that children extract from visual images, a Perceptual Skills Assessment. Is a child's visual perception automatic, organized, age appropriate and can perceptual information be easily remembered? Extraordinary reversal difficulty with letters and words can indicate perceptual immaturity. Difficulties with sight word identification, or late acquisition of math concepts, and poor copying skills can all be indicators of visual perceptual immaturity. School psychologists and resource specialists do some visual perceptual testing, but they rarely make recommendations for improving deficient perceptual skills. Most

optometrists, however, who specialize in children's vision do offer both testing and perceptual therapy services. Reading disabilities result from a multiplicity of factors, some of which are visual and perceptual in nature, so it is imperative that these visual factors be taken into account in the total management of the reading disabled child. When parents and teachers want to rule out visual factors that affect reading performance, they need to seek levels two and three of vision testing - first, a Visual Efficiency Evaluation and possibly, a Perceptual Skills Assessment. Scott's parents did and after three months of vision therapy (30 minutes per day) both his attitude and reading performance shot up beyond expectations.

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Table 1

Analysis of Literature Relating Visual Efficiency Disorders and Reading Progress

- Conditions Statistically Related to Good Reading:
 - Nearsightedness (Myopia)
- Conditions Statistically Related to Poor Reading:
 - Farsightedness (Hyperopia)
 - Different Refractive Errors in Each Eye (Anisometropia)
 - Deficient Eye Teaming (Exophoria, Hyperphoria, and Convergence Insufficiency)
 - Binocular Fusion Deficiency
 - Focusing Deficiency (Accommodative Insufficiency)
 - Tracking Deficiency (Oculomotor Dysfunction)

Table 2

Common Visual Symptoms and Behaviors Associated With Visual Efficiency Disorders

SYMPTOMS:

- Tired eyes when reading
- Intermittent blurring of print
- Blurred distance vision for awhile after reading
- Print moving, jumping, pulsating, or floating
- Double vision at near distances
- Eye strain or sense of discomfort with reading
- Frontal headaches initiated by reading
- Eye redness (inflammation), blinking, or sensitivity to light

BEHAVIORS:

- Frequent loss of place
- Rereading same line
- Skipping letters, words, or lines
- Covering one eye or tilting head when reading
- Becoming distracted, restless, or inattentive when reading
- Avoidance or dislike of reading