

Seeing is Achieving

Uncovering the Hidden Vision Problems that May Impact Student Performance

By Shane Foster, OD



Have you ever had a student that was fidgety, had difficulty concentrating or complained of headaches? Did you ever think that a vision problem might be to blame?

It goes without saying that vision plays a crucial role in the learning process. In fact, 80% of what we learn every day comes to us as visual input. However, 1 in 5 school-aged children has a vision problem that may hinder their ability to learn and succeed in the classroom. Most people are familiar with common vision disorders like nearsightedness, farsightedness and astigmatism, but these are only a few of the conditions that affect vision.

Interestingly, many of the vision problems that interfere with the learning process are much more difficult to diagnosis, and they may go unnoticed at first, which can delay intervention and interfere with childhood development. These conditions are categorized as binocular vision disorders (problems with eye

muscle control) and accommodative disorders (problems with the eyes' focusing system).

Binocular vision involves the manner in which the two eyes work together as a team ("bi-" meaning two; "ocular" meaning eye). Each eye sends visual input through the optic nerve to the vision center of the brain, and the brain overlaps these images to create a single binocular view. If the eyes are misaligned, the brain may not be able to overlap the images, and the individual can see double. So, even if each eye can see "20/20," a person may still have issues with coordinating the two eyes together. The movement of each eye is controlled by six different eye muscles, which must move in unison with delicate coordination to keep both eyes pointed at the same object. If there is a slight misalignment, the brain will send signals to the eye muscles to make small adjustments to keep everything perfectly aligned.

However, some people have deficiencies in the eye coordination system that make it more difficult to overcome those minor misalignments. These conditions include:

- Convergence insufficiency (eyes have difficulty turning in/crossing)
- Convergence excess (eyes turn in or cross too much)
- Divergence insufficiency (eyes have difficulty turning out/uncrossing)
- Divergence excess (eyes turn out or uncross too much)

There are also muscles *inside* the eye that control the focusing of the internal crystalline lens, which helps us adjust our focal distance when we need to switch between viewing objects in the distance and viewing objects up close. This is called accommodation, and it is normally an automatic, thoughtless process that happens instantaneously when an individual shifts their attention from one object to another. Disorders associated with the focusing system are:

- Accommodative insufficiency (difficult focusing the eye muscles up close)
- Accommodative excess (difficulty relaxing the eye muscles for distance viewing)
- Accommodative infacility (difficulty adjusting the eyes' focus back and forth between distance and near)

Children with eye muscle disorders are often misdiagnosed with reading problems, learning disabilities, autism spectrum disorders and ADHD, since the symptoms of these conditions sometimes overlap with those of binocular vision or accommodative vision problems. These symptoms include:

- Headaches
- Eyestrain
- Fatigue
- Difficulty concentrating
- Short attention span
- Loss of place when reading
- Using a finger to follow lines when reading
- Skipping lines or re-reading lines
- Avoidance of reading/near work
- Intermittent blurred vision

Unless a proper comprehensive eye examination by a licensed eye care professional is performed, it may be difficult to discern if the child's issues stem from a behavioral issue or a vision issue. For this reason, it is recommended that all school-aged children have a comprehensive eye exam at least annually.

As educators, you may be the first to observe some of these symptoms of vision disorders in your students. As music teachers, the effects you see may be even more pronounced since reading music involves more complex visual coordination than reading text (discerning the vertical position of notes on the staff, attending to multiple staves at once, or jumping around a score due to various repeated sections).

It is important to report any suspected symptoms of visual problems so that these students can be referred on for proper evaluation and management. Remember that even children who pass a vision screening and have "20/20" vision may still have an underlying "hidden" vision disorder that can interfere with their ability to learn. Keep this in mind as you observe your students, watch for the warning signs discussed previously and use your position to advocate for their well-being. The action you take by simply recommending a comprehensive eye exam may change the course of that child's educational future, finally allowing them to unlock all of the tools necessary to have the opportunity to succeed. ■

Shane Foster, OD, is an optometrist from Athens, Ohio, who has a special interest in children's vision issues and the deep connection between vision and learning. In his roles as president of the Ohio Optometric Association and past president and board member of the Ohio Optometric Foundation, he is an advocate for children's vision issues and increasing access to eye care for the underserved.

