



“See-N-Read”

A Brief Neurosystems Overview of Visual Pathways Governing Reading: A Neuropsychology Perspective

Reading is a complex function, requiring a working relationship among multiple brain areas. It is important to recognize the contribution of each area of the brain involved in reading, however, the focus of this synopsis is to address the contribution of visual pathways, subcortical and cortical pathways (deep brain and higher level visual brain areas).

Many very bright children and adults who do not have vision problems struggle with words affecting reading rate, fluency, accuracy and comprehension. There are various underlying reasons for these difficulties, yet it is important to understand that the brain can reorganize itself as well as develop new connections and pathways.

The occipital area of the brain is the cortical brain center of the visual system. It is linked with deeper subcortical brain areas associated with visual attention, efficient light-dark modulation and the efficient speed-rate of eye movement that influence visual brain pathways helping us to focus, analyze and store information within the visual brain.

The higher cortical visual system involves a hierarchy of related pathways regulating reception, analysis and storage of visual stimuli. Primary cortical visual brain areas are responsible for visual reception of stimuli-symbols. Sedentary areas are responsible for synthesis of visual stimuli. This area converts projections of incoming visual stimuli into complex visual perception. Individual pieces of stimuli are coded into visual patterns relying on well modulated eye movements to do so. The tertiary visual brain areas connect visual stimuli with other sensory pathways and aid in visual/spatial organization such as understanding the spatial position of lines of letters.

Briefly, I will note these visual perceptual pathways of the left brain hemisphere are quite different in function than those of the right hemisphere. The left hemisphere pathways are very closely associated with speech and language. This is why, for example, if someone has difficulty recognizing the visual formation of letters yet the sound-phonetic cue is efficient (requiring intact auditory pathways), the associated visual-auditory speech centers may prompt visual recognition.

Reading programs that build upon efficient eye movement, head/neck positions, body positions related to reading and writing, eye/hand motor coordination, horizontal/vertical formation of letters, visual memory, sight-symbol/sound-symbol/tactile symbol synthesis and multi sensory memory and expression of visual included stimuli promote the visual coding process of reading. Building upon these brain pathways promotes childrens learning and potential for success at home, school and beyond.

Another very important point in understanding the working relationship of multiple brain areas for all learning, not just reading, is that the brain is the only organ in the human system that learns with complexity and can reorganize itself and form growth based upon stimuli from internal/body cues and from external/environmental cues. **THE BRAIN LEARNS!!!!**

The See-N-Read is a good example of an external/environmental cue that promotes the working relationship of visual brain pathways necessary for reading. The See-N-Read can aid in developing reading rate, accuracy, fluency and comprehension. It reduces pattern glare. Pattern glare is created by spacing between lines on text (ie. lines on a striped shirt often appear to move). The See-N-Read blocks pattern glare resulting in more efficient eye scanning (eye moving from point-to-point) and eye fixations (eyes fixed at a certain point). The user can also control the rate/pace of vertical movement of the See-N-Read as well as vertical-horizontal movement thereby with practice, further increasing reading efficiency. It can aid in preventing unnecessary head/neck and eye/hand incoordination related to inefficient eye movement and inefficient focusing. Fatigue, body strain, head tilt and headaches when reading can also be decreased. It can also lessen having to use fingers to guide eyes that can slow reading rate.

The See-N-Read was developed by dedicated educators. It is a guide for developing the reading process. Reading skills can improve at any age. The See-N-Read is encouraging for the use because easy use makes it adaptable and motivating. Practice with the See-N-Read can help make reading skills more automatic that encourages reading for pleasure. Congratulations to the See-N-Read developers. You have the ability to touch the lives of many.