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Teri Lawton

Perception Dynamics Institute, USA

Dynamic visual attention neurotraining to improve visual timing significantly improves attention, working memory, processing speed and reading fluency in children and adults

Studies to improve the brain's visual timing by using dynamic visual attention neurotraining (*PATH to Reading/Insight* neurotraining) improved vision and cognitive skills in children and adults. We found that improving the speed and sensitivity of figure-ground movement discrimination, remediating visual timing deficits in the dorsal stream, improves processing speed and reading fluency, and the executive control functions of attention and working memory in people with learning problems, Traumatic Brain Injuries (TBI), older adults, and in typically developing children. This patented neurotraining, visually-based cognitive training designed to improve magnocellular function at both low and high levels in the dorsal stream, the input to the executive control networks coding working memory and attention, represents a novel type of visually-based cognitive therapy, using a paradigm shift to improve visual and cognitive skills rapidly. Standardized tests were administered at the beginning and end of the *PATH* neurotraining to evaluate improvements in visual and cognitive skills. Movement-discrimination cognitive neurotraining (10-15 minutes twice a week for 8-16 weeks) remediated both low-level visual timing deficits and high-level cognitive functioning, including selective and sustained attention, reading fluency, processing speed, and working memory for all the people we studied. Magnetoencephalography (MEG) brain imaging showed that this movement-discrimination training improved the dorsal stream, attention, and executive control networks in both dyslexics and those with TBIs. Remediating visual timing deficits in the dorsal stream revealed the causal role of visual movement discrimination training in improving high-level cognitive functions such as focusing and switching attention, reading fluency, processing speed, and working memory.

Biography

Teri Lawton completed her PhD at UCSB in 1983, and postdoctoral studies at Caltech. She is the CEO and Director of Research at Perception Dynamics Institute, providing Cognitive Neuroscience Remediation for all ages. She is the author of over 72 published scientific papers, holds several patents, and has spent more than four decades studying the neurobiology of the visual system. She has been developing neurotraining devices, patented in the U.S. and worldwide, to improve perception and cognition since the late seventies, having over 40 years' experience doing visual psychophysical studies and over 30 years' experience running controlled validation studies.

tlawton@pathtoreading.com

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