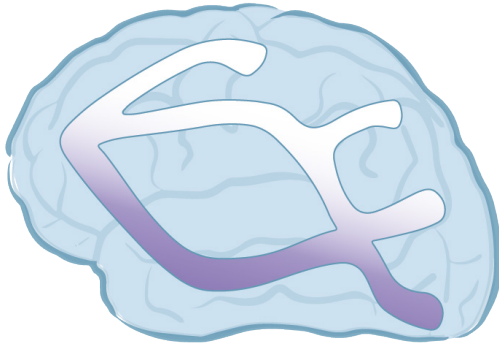


Reaction Time



Brain Network

Reaction time involves posterior hubs including the occipito-temporal association area, the temporal-parietal junction, and parietal lobe as well as the inferior frontal gyrus. These are bimodal multisensory association hubs critical to linking visual, spatial, and auditory information.

Academic Relevance

Nearly two-thirds of Carroll students have an RT weakness before they complete any cognitive intervention. These students often have average to above-average phonemic awareness and are able to master Orton-Gillingham principles and rules. They may be able to identify sight words and decode unfamiliar words accurately, but are not able to do so quickly and automatically. This makes reading slow and laborious. These students usually have low reading fluency scores, both single-word and connected text.

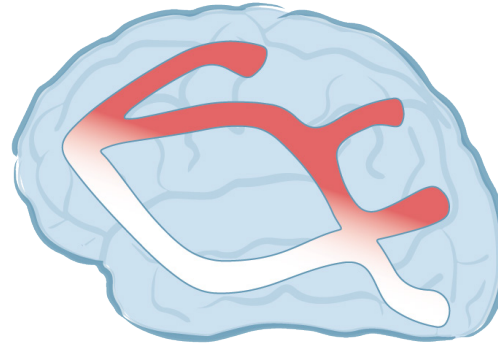
Targeted Cognitive Intervention

During a Reaction Time TCI, students are engaged in activities requiring response to the visual features of non-text stimuli. This requires linking visual and auditory systems as well as executive functions for response selection. As they progress through levels, students must become faster and more accurate in their responses.

Activities

Reaction Field, Lane Changer, Mahjong

Working Memory



Brain Network

Working memory requires good functional connections among the dorsolateral prefrontal cortex, the inferior frontal gyrus, cingulate, and parietal, temporal, and occipital hubs.

Academic Relevance

Working memory involves the ability to store and manipulate information, sustain attention, and avoid distractibility. Carroll students may have problems with visual working memory, verbal working memory, or both. Students assigned to this intervention are likely to have lower phonemic awareness, be less able to identify sight-words quickly and accurately, and generally struggle with reading comprehension and mathematics.

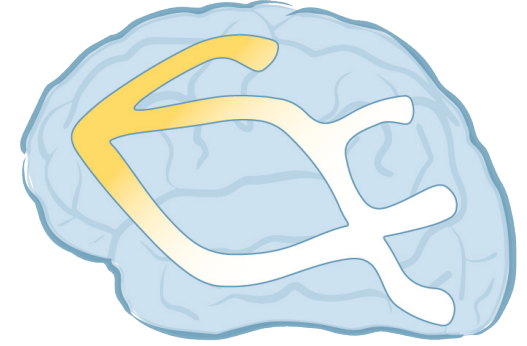
Targeted Cognitive Intervention

Activities in the WM TCI require students to hold onto and recreate or transform visual stimuli. As they progress through levels, students must develop strategies for memorizing increasingly complex sequences of information.

Activities

Water Lilies, Jigsaw 9, Candy Factory

Executive Function



Brain Network

The dorsolateral prefrontal cortex, cingulate gyrus, and inferior frontal gyrus must work together to regulate the task-specific functions of the sensory integration hubs (parietal lobe, temporo-parietal junction, and the ventral occipital-temporal cortex).

Academic Relevance

Students assigned to an Executive Function TCI tend to have reading fluency scores on the high end as compared to other Carroll School students, but struggle with the higher-order thinking necessary for reading comprehension and more complex math problems. They most likely have trouble making contextual inferences and completing multi-step projects or problems.

Targeted Cognitive Intervention

The activities in the EF TCI present students with the challenges of responding in different ways to changing patterns (shifting attention), and working to solve multi-step problems (planning).

Activities

Fresh Squeeze, Sudoku, Bee Balloon

