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82 Heart Rate Variability Biofeedback for Mild Traumatic Brain Injury

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Objective: Heart rate variability (HRV) can be an indicator of the flexibility of the central and autonomic nervous systems. Heart rate variability biofeedback (HRV-BF) has been shown to validate the neuro-peripheral relationship and enhance the interaction between top-down and bottom-up processes. Few previous studies have focused on the treatment outcomes of HRV-BF in traumatic brain injury, and such studies have been mostly limited to pilot studies or case reports. The purpose of this study is to investigate the efficacy of HRV-BF for neuropsychological functioning in patients with mild traumatic brain injury (mTBI).

Participants and Methods: Forty-one patients with mTBI were referred from the neurosurgery outpatient program and randomly assigned to a psychoeducation group or a HRV-BF intervention group. The psychoeducation group received standard medical care and one 60-minute psychoeducation session after brain injury. The HRV-BF group received standard medical care and one 60-minute session of the HRV-BF intervention weekly for 10 weeks. All participants received performance-based and self-reported neuropsychological measures of memory, executive function, mood, and information processing at week 1 of injury (pretest) and week 12 (posttest).

Results: Participants in HRV-BF improved significantly after the intervention compared with the psychoeducation group on the Verbal Learning Test, Frontal Assessment Battery, Verbal Fluency Test, Paced Auditory Serial Addition Test, Trail Making Test, Dysexecutive

Questionnaire, Depression Inventory, and Checklist of Post-concussion Symptoms.

Conclusions: HRV-BF was found to be an efficacious and efficient intervention for improving neuropsychological functioning in patients with mTBI and a potential candidate for mTBI rehabilitation.

Categories: Cognitive Intervention/Rehabilitation

Keyword 1: concussion/ mild traumatic brain injury

Keyword 2: neuromodulation

Keyword 3: cognitive functioning

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83 Efficacy of a Tablet-Based Cognitive Flexibility Intervention in Youth with Executive Function Deficits

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Objective: Executive functions (EFs) are considered to be both unitary and diverse functions with common conceptualizations consisting of inhibitory control, working memory, and cognitive flexibility. Current research indicates that these abilities develop along different timelines and that working memory and inhibitory control may be foundational for cognitive flexibility, or the ability to shift attention between tasks or operations. Very few interventions target cognitive flexibility despite its importance for academic or occupational tasks, social skills, problem-solving, and goal-directed behavior in general, and the ability is commonly impaired in individuals with neurodevelopmental disorders (NDDs) such as autism spectrum disorder, attention deficit hyperactivity disorder, and learning disorders. The current study investigated a tablet-based cognitive flexibility intervention, Dino Island (DI), that combines a game-based, process-specific intervention with compensatory metacognitive strategies as

delivered by classroom aides within a school setting.

Participants and Methods: 20 children between ages 6-12 years ($\bar{x} = 10.83$ years) with NDDs and identified executive function deficits and their assigned classroom aides (i.e., "interventionists") were randomly assigned to either DI or an educational game control condition. Interventionists completed a 2-4 hour online training course and a brief, remote Q&A session with the research team, which provided key information for delivering the intervention such as game-play and metacognitive/behavioral strategy instruction. Fidelity checks were conducted weekly. Interventionists were instructed to deliver 14-16 hours of intervention during the school day over 6-8 weeks, divided into 3-4 weekly sessions of 30-60 minutes each. Baseline and post-intervention assessments consisted of cognitive measures of cognitive flexibility (Minnesota Executive Function Scale), working memory (Wechsler Intelligence Scales for Children, 4th Edn. Integrated Spatial Span) and parent-completed EF rating scales (Behavior Rating Inventory of Executive Function).

Results: Samples sizes were smaller than expected due to COVID-19 related disruptions within schools, so nonparametric analyses were conducted to explore trends in the data. Results of the Mann-Whitney U test indicated that participants within the DI condition made greater gains in cognitive flexibility with a trend towards significance ($p = 0.115$). After dummy coding for positive change, results also indicated that gains in spatial working memory differed by condition ($p = 0.127$). Similarly, gains in task monitoring trended towards significant difference by condition.

Conclusions: DI, a novel EF intervention, may be beneficial to cognitive flexibility, working memory, and monitoring skills within youth with EF deficits. Though there were many absences and upheavals within the participating schools related to COVID-19, it is promising to see differences in outcomes with such a small sample. This poster will expand upon the current results as well as future directions for the DI intervention.

Categories: Cognitive Intervention/Rehabilitation

Keyword 1: cognitive rehabilitation

Keyword 2: executive functions

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84 Preferred Compensatory Cognitive Training Strategies Among Older Adults with Mild Cognitive Difficulties

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Objective: Older adults experiencing mild cognitive difficulties (MCD) may benefit from compensatory cognitive training (CCT) to address cognitive changes. CCT can be delivered over various lengths of time and can focus on a specific cognitive domain (e.g., memory) or multiple domains. Identifying the most relevant and impactful portions of a CCT intervention could allow for more effective and streamlined delivery of compensatory strategies, perhaps allowing this type of training to be included in feedback sessions or brief interventions. This study sought to investigate which factors older adults with MCD found to be most beneficial and applicable to their daily lives after completion of a brief telehealth CCT program.

Participants and Methods: Adults age 55+ with documented MCD ($n=28$) and an optional care partner (CP; $n=18$) were recruited for video-chat delivery of a 6-week, motivationally-enhanced CCT program adapted from CogSMART. The six weeks included content addressing: Education and Lifestyle Strategies (Session 1); Organization, Prioritization, and Prospective Memory (Session 2); Attention, Concentration, and Working Memory (Session 3); Learning and Memory (Session 4); Executive Functions: Decision-Making, Problem-Solving, and Planning (Session 5); and Skills Integration and Next Steps (Session 6). After completing the course, participants ($n=25$) provided open-ended feedback on course content, including the areas they found most helpful. They were also asked which strategies from the course they had successfully applied in their daily lives, and which they expected to continue using following the course. Qualitative data were coded and analyzed by two researchers.