Interactive Metronome® Helps Merle Overcome his Stress and Stay on Track

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Merle is a 36 year old male, a college student and a father who volunteered for the Brain Training project study. He is an Iraqi Conflict veteran who had difficulty with paying attention and "staying on track" with his thoughts. Merle reported that he was currently going through a separation and possible divorce from his wife, that he was caring for his children and navigating through negotiating custody, that he was attending college full-time, working part-time at two jobs and that he was navigating the bureaucracy of the Veterans Administration in order to meet his expenses and stay in school.

He chose to participate in the Interactive Metronome® (IM) study with the hope that doing so would primarily help him out in his studies; he also complained of psychosocial stressors impacting his daily performance and quality of life. Interactive Metronome® (IM) is the only training program that improves timing in the brain in an organized, systematic, flexible and engaging format. Research shows that engaging whole body movements in combination with cognitive tasks leads to overall better outcomes. IM is a patented and unique training tool that challenges thinking and movement simultaneously, providing real-time millisecond feedback to help synchronize the body's "internal clock."

Merle's initial approach to the IM tasks was somewhat immature; he required and asked for a good deal of reassurance, talking consistently during the tasks. He would try hard to maintain focus physically squinting his eyes, sticking out his tongue, attempting to stay very still, holding on to his chair to maintain balance and bending his knees to maintain his focus, as the tasks became more difficult. However, Merle would become easily frustrated due to the number of repetitions and would stop completely when he was not on beat in order to get back on the beat.

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He would comment on how IM equipment was inaccurate and was not properly registering his beats and that the IM program was "outdated", while wandering and looking around the room.

As he approached the latter tasks in the Long Form Assessment (LFA) he would sway back and forth and prep himself by doing dance moves to try and get coordinated. He became more frustrated with the simultaneous tasks and would claim, "That's not my real score. Whatever, I'm doing better than it says. Let's get it." Merle found tasks requiring fluid circular motion particularly challenging and would fall back on straight clapping. His competitiveness would emerge and remained consistent throughout the IM training although he remained frustrated with the time on task and the number of repetitions. However when doing well, Merle would have tendency to stop and celebrate and then start back up again. Midway through the intervention we began to share with Merle his burst reports set at 4. Using 'bursts" served as a motivator and over time Merle complained less about IM "tricking" him and he would focus on his scores. As we approached the latter sessions of the intervention we observed fewer incidents of his mind wandering or of his shifting focus when someone would walk by.

A number of best practices were used to assist Merle in improving his level of focus. We structured his program around a modified Plan B template and divided the plan into 5 phases for a total of 23 sessions, not including pre-interim-post LFA. We met with Merle on the average of 2 sessions per week. We would make changes in the session attributes based on weekly performance analysis and comparison reports with previous sessions, with first LFA and with best scores, with a focus on maintaining a balance between challenging Merle and allowing for a sense of success.

For example, we began his protocol using a Plan B template but increased the tempo to 60bpm (beats-per-minute) from the standard 54bpm given Merle's 90% early hit rate on the pre-LFA. He experienced early success and this became very important in maintaining his engagement in the intervention.

We maintained the tempo at 60bpm until the 5th session where we decreased it to 50bpm. This proved challenging for Merle; however, he quickly adjusted to the new tempo. On the 7th session we increased the difficulty level 150 to 100 while maintaining the tempo at 50bpm and by the 9th and 10th sessions we began to introduce lower extremity tasks with the difficulty level at 100 while increasing the difficulty level to auto difficulty for hand-related tasks.

Merle continued to make the anticipated solid adjustments as we moved him through the protocol with a combination of successes and challenges. Merle showed significant improvements by the interim LFA (14th session).

Evaluation

Merle reported improvement in organizational skills, concentration/focus, and ability to multi-task and in coping skills. Further, Merle reported a marked increase in ability to focus when studying and during lectures, in retention after reading and lectures, being more fluent and speedy when reading, when taking notes, during exams and when answering questions.

Performance on numerous tasks scored in the below average range, while several tasks revealed performances in the severe to extreme deficiency range. The significant early hit rate was consistent with impairment in impulse control that is characteristic of Merle.

His unadjusted score was 105.5 MS (milliseconds), with 90.6% of hits being early and 9.4% being late.

Merle demonstrated a fairly significant right/left side difference and experienced great difficulty with tasks requiring movement of the lower extremities. At interim LFA, Merle's total unadjusted score improved to 71.2 MS By the end of the the intervention Merle posted significant gains. His post LFA performance revealed a total unadjusted score of 17.6 MS with 57.8% early hit rate and 42.2% late hit rate. The right/left side difference was negligible at 14.3 MS and 19 MS respectively.

His "percentage within 15 MS" scores improved from 9.4% (pre) to 32% (interim) to 60.5% (post). Merle's total number of IAR (in-a-row) bursts improved from 1 (pre) to 11 (interim) to 27 (post). In addition, Merle produced a consistent increase in short form SRO% (super right on) and a lowered task average. His concentration, focus and endurance had much improved.

At a three-week follow up, Merle reported no noticeable dramatic changes in memory or sensory motor functioning. However, he reports feeling more confident in his everyday interactions including experiencing more clarity in his social functioning. His reading speed has improved and he is feeling confident about completing the two online summer compressed courses he is currently enrolled in. Although he is still under great stress, Merle feels he is experiencing an unusual sense of calm. This behavioral outcome is consistent with his vast improvement in timing and hemispheric balance. His improvement in focus and concentration reflects an increase in attentional-capture and as a result, less mind wandering.

Merle is excited about his newfound ability to cope and has said:

"My ability to deal with multiple high level stressors has enhanced. I feel like overall I can function at a higher rate of efficiency and speed."