Efficacy of the Interactive Metronome® for Improving Attention in Veterans Returning to School Settings: A Pilot Study

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ABSTRACT

The purpose of this project was to measure the effectiveness of the Interactive Metronome specific to improving attention.

- Could veterans that have expressed concern of attention problems benefit from the Interactive Metronome?
- Will the IM intervention lead to gains in attention that will lead to higher satisfaction in the attainment of higher education or job security?

INTRODUCTION

With the inception of the GI Bill, there has been an increased enrollment of veterans in colleges and universities. However, veterans' adjustment to school is different than that of a civilians'.
•Concerns of PTSD, TBI, depression
•Issues with memory, attention, concentration, and executive functions leave an impact on daily life

93% of veteran participants described troubles with the occupation of school, one of the factors being adequate concentration.

An RCT at the Defense and Veterans Brain Injury Center at Fort Carson, studied those with blast related TBI and related cognitive complaints. Those who received standard rehabilitation care (SRC) and IM therapy versus SRC alone showed positive neuropsychological outcomes in areas such as attention, immediate memory, and delayed memory.

MATERIALS & METHODS

Recruited veteran (prior Active Duty or contractors) students and employees from East Carolina University who self-identified as having problems with attention. Subjects were given the IM-Home system after meeting with the PI to complete the Canadian Occupational Performance Measure (COPM), d2 Test of Attention, and learning to use the system. After 15 at home sessions (4-6 weeks) with the IM based on the attention protocol, participants retook the COPM and D2.

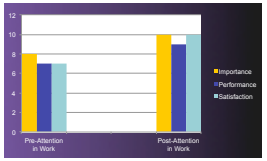
The IM is a computerized program that operates on the theory of "training the brain to plan, sequence, and process information more effectively through repetition of interactive exercises". It's been shown to improve: attention, motor planning, focus, and aggression.

RESULTS

Participant 1

Female, 55, Full Time University Employee.
Government Contractor for 14 years.
Has felt that in the last 3 years she's been more forgetful, can't remember names, last minutes appointments, has to work harder at keeping attention.

COPM



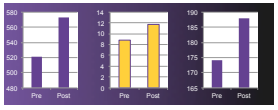
IM LFA

% Performance Change From A to B*

Task Avg	Var Avg	SRO%
74.88	58.02	651.67
83.47	83.44	116.65
64.47	31.71	399.70
70.57	59.55	
82.56	82.08	800.90
-6.50	-10.64	-79.19
66.38	73.29	99.85
62.66	60.36	214.21

d2 Test of Attention

L to R: Total Numbers Processed, Percentage of Errors, Concentration Performance

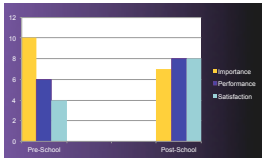


"I have consistently been able to stay more on one task and be more efficient." She also reported being much more focused.

Participant 2

Male, 29, Full Time Student , Employed Part Time.
Prior Army for 5 years.
Has noticed change in attention and more forgetfulness as time has gone on. Reports lapses of concentration while studying and in the classroom.

COPM



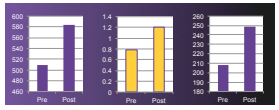
IM LFA

% Performance Change From A to B*

Task Avg	Var Avg	SRO%
72.47	62.30	256.62
68.33	60.34	727.14
66.34	47.14	700.90
53.85	55.41	620.72
52.76	32.65	503.91
25.67	6.06	37.76
58.67	52.54	233.3
43.53	35.09	117.02
51.16	41.86	236.31
52.19	50	122.29

d2 Test of Attention

L to R: Total Numbers Processed, Percentage of Errors, Concentration Performance

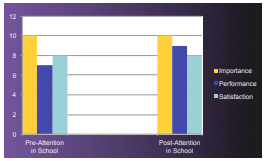


Participant reported no differences in lapses of concentration or a change in attention.

Participant 3

Male, 38, Full Time Student
Prior Marine Corps for 3 years
Wanted to improve attention, narrow focus. Has noticed that he less able to multitask and is more scattered.

COPM



IM LFA

% Performance Change From A to B*

Task Avg	Var Avg	SRO%
82.03	51.22	1252.73
70.06	57.14	325.13
49.27	28.57	47.66
65.82	10.81	399.70
82.63	37.14	
68.62	29.73	433.3
77.97	74.71	833.61
69.16	14.29	
77.04	-55.17	
71.57	35.94	356.22
47.75	24.39	

d2 Test of Attention

L to R: Total Numbers Processed, Percentage of Errors, Concentration Performance

Participant reported that he is a a little better with multitasking and has started using other methods to help with organization.

DISCUSSION

- Through the COPM, we found that all participants rated their satisfaction with attention in school or work higher than before they started the IM.
- With minor exceptions, participants improved in their performance with the IM over 15 sessions.
- All participants were able to process more information in their post-test d2 Test of Attention. Although two of the three participants also showed an increase in percentage of errors, they all improved in the Concentration Performance measure. This measures the coordination of speed and accuracy of performance in the test.
- Two of the three participants felt that the IM helped with better attention, thus improving their school and work performance.
- Based on our results and past studies, we believe that the Interactive Metronome is a valuable tool in the rehabilitation process and may be especially helpful for veterans.
- Another large, longitudinal randomized control trial with a more homogenous sample will give clearer indications of the efficacy of the Interactive Metronome.

REFERENCES

Davidson, L., Erickson, M. W., Radomski, M. V., & Voydetich, D. (2009). Occupational therapy for service members with mild traumatic brain injury. *AJOT: American Journal of Occupational Therapy, 63*(5), 646+.
IM Certification Provider Training Manual (2009).
Nelson, L., MacDonald, M., Glover, C. ,Brewer, K. (2013) Effects of interactive metronome therapy on cognitive functioning after blast-related brain injury: A randomized controlled pilot trial. *Neuropsychology, 27*(6), 666-679.
O'Herrin, E. (2011). Enhancing Veteran Success in Higher Education. *Peer Review, 13*(1), 15-18.
Plach, H. L., & Sells, C. H. (2013). Occupational performance needs of young veterans. *AJOT: American Journal of Occupational Therapy, 67*(1), 73+.

ACKNOWLEDGEMENTS

I would like to thank my research advisor, Dr. Trujillo for the time and mentoring he has provided me in this process. Thank you to my advisory committee for helping me grow as a researcher and student.
Thank you to Interactive Metronome for providing our veterans with the equipment and support we needed to complete this project.