interactive metronome®

IM Training Helps Joseph Chase Down His Dreams

Joseph is 18 years old. He is the oldest of two children and lives at home with his mother, father, and younger brother. He has been diagnosed with Asperger's Syndrome, which causes difficulty functioning in social situations and struggles in academic performance. Joseph is currently enrolled at Lexington High School where he receives special services in a self-contained environment. Joseph is involved in several extra-curricular, which include running Varsity Cross Country and participating in activities sponsored by his church. Joseph is also working a part-time job at a Retirement Center where he hopes to begin pursuing his ambitions of becoming a chef. Joseph was seen for Interactive Metronome training and speech and language evaluation at the Palmetto Language & Speech Center, LLC based on a physician referral.

The Interactive Metronome (IM) is a brain-based rehabilitation assessment and training program developed to directly improve the processing abilities that affect attention, motor planning, and sequencing. This, in turn, strengthens motor skills, including mobility, gross motor function, and many fundamental cognitive capacities such as planning, organizing and language.

The normative ranges for IM performance are as follows:

Age	6	7-8	9-10	11-12	13-15	16+
Extreme Deficiency	280+	270+	260+	240+	215+	200+
Severe Deficiency	175-279	170-269	160-259	155-239	150-214	147-199
Below Average	120-174	90-169	80-159	75-154	72-149	70-146
Average	*90-119*	*65-89*	*55-79*	*45-74*	*43-71*	*41-69*
Above Average	56-89	45-64	38-54	36-44	33-42	30-40
Exceptional	40-55	32-44	28-37	26-35	23-32	22-29
Superior	< 40	< 32	< 28	< 26	< 23	< 22

There are fourteen tasks measured in the long form assessment taken at the beginning, middle and end of IM training. Joseph's training included 15 sessions, administered over a three month period.

Before training began, Joseph scored in the extreme deficiency range. After completing the IM training, he scored in the exceptional range.

Results following 15 sessions with IM training:

Task	Milliseconds	
	Pre 7/25/08	Post 10/13/08
Both Hands	122	25
Right Hand	304	39
Left Hand	317	23
Both Toes	308	21
Right Toe	331	18
Left Toe	393	25
Both Heels	303	34
Right Heel	408	29
Left Heel	253	24
Right Hand/Left Toe	386	36
Left Hand/Right Toe	362	25
Balance Right Foot	312	16
Balance Left Foot	311	13
Both Hands (w/ guide sounds)	300	20
Total	315.0	24.9

Before and after Joseph's IM training his parents were given parent surveys. The Parent Survey asks the parents to rate Joseph's behavior on daily function tasks and communication tasks with ratings ranging from 1 being "strongly disagree" and 10 being "strongly agree." For example, a daily function task item is "My child is able to remember lists and information heard." An example of a communication task is "My child gives answers to Yes/No questions appropriately." The parents rated an improvement in 13 out of the 16 opinion statements.

* Along with IM training, the examiner also measured Joseph's speech and language skills. The results are can be found on the back.

Along with IM training, the examiner also measured Joseph's speech and language skills. The *Oral and Written Language Scale (OWLS)* was administered to Joseph before IM training, and again as a follow-up assessment. The OWLS was designed to measure listening comprehension and oral expression abilities in children from age 3 to 21. Derived scores for the OWLS can be obtained using raw score, standard score, percentile rank and age equivalent. The OWLS has a mean score of 100 with a standard deviation of 15.

	Raw Score		Standard Score		Percentile		Age Equiv.	
	Pre	*Post*	*Pre*	*Post*	*Pre*	*Post*	*Pre*	*Post*
Listening Comprehension	74	86	79	91	8	27	10-6	15-3
Oral Expression	77	83	88	94	21	34	13-6	16-3
Oral Composite	n/a	n/a	82	91	12	27	12-0	16-0

Based on raw scores, standard scores, percentiles and age equivalents with the above measures, Joseph showed significant gains in areas measured after receiving IM training.

The *Test of Pragmatic Language-2 (TOPL-2)* was administered prior and post-IM training. The TOPL-2 was designed to measure social skills and social language use in people ages 5 to through 18. The TOPL-2 measures seven core subcomponents of pragmatic language: physical context, audience, topic, purpose, visual-gestural cues, abstractions and pragmatic evaluation. Derived scores for the TOPL-2 can be obtained using raw score, percentile rank, pragmatic language usage index and age equivalent.

Raw Score		Percentile Rank		Pragmatic Language Usage Index		Age Equiv.	
Pre	*Post*	*Pre*	*Post*	*Pre*	*Post*	*Pre*	*Post*
19	30	5	37	76	95	8-7	14-7

Based on raw scores, percentiles, pragmatic language usage index and age equivalents with the above measures, Joseph showed significant gains in areas measured after receiving IM training.

The *Test of Auditory Processing Skills-3 (TAPS-3)* was also administered to Joseph before and after IM training. The TAPS-3 was designed to assess the processing of auditory information that pertains to the cognitive and communicative aspects of language. The TAPS-3 subtests were designed to provide information for four areas: auditory attention, basic phonemic skills, auditory memory and auditory cohesion. Derived scores for the TAPS-3 can be obtained using raw score conversion to scaled score, standard scores, percentiles, and test-age equivalents. All subtests were presented in a quiet listening environment without distractions.

Subtests	Raw Score		Scaled Score		Percentile	
	Pre	*Post*	*Pre*	*Post*	*Pre*	*Post*
Word Discrimination	31	32	10	12	50	75
Phonological Segmentation	31	34	8	10	25	50
Phonological Blending	26	32	12	13	75	84
Number Memory (Forward)	27	27	13	12	84	75
Number Memory (Reversed)	16	22	10	13	50	84
Word Memory	20	20	8	8	25	25
Sentence Memory	18	21	4	5	2	5
Auditory Comprehension	20	29	7	11	16	63
Auditory Reasoning	9	16	4	6	2	9

INDEX AND OVERALL SCORES

	Sum of Scaled Scores		Standard Score		Percentile	
	Pre	*Post*	*Pre*	*Post*	*Pre*	*Post*
Phonological Skills (Subtests 1-3)	30	35	100	109	50	73
Memory (Subtests 4-7)	35	38	94	98	34	45
Cohesion (Subtests 8 and 9)	11	17	78	93	7	32
Overall	76	90	92	100	30	50

Based on standard scores with the above measures, Joseph showed significant gains in areas measured after receiving IM training.

Summary of Findings

- During pre-testing, Joseph scored in the extreme deficiency range. After completing the IM training, he scored in the exceptional range.
- In support of the IM assessment, the formal speech language evaluation measurements also support that Joseph made significant gains.
- Joseph's parents also report (based on the Parent Survey) that he has made improvement on daily function and communication tasks.

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