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# The integration of the neurosciences, child public health, and education practice: hemisphere-specific remediation strategies as a discipline partnered rehabilitation tool in ADD/ADHD

Gerry Leisman<sup>1,2,3\*</sup>, Raed Mualem<sup>1,4,5</sup> and Calixto Machado<sup>3,6</sup><sup>1</sup> The National Institute for Brain and Rehabilitation Sciences, Nazareth, Israel<sup>2</sup> Human Factors, Department of Biomechanics, ORT–Braude College of Engineering, Karmiel, Israel<sup>3</sup> Neurology, University of the Medical Sciences, Havana, Cuba<sup>4</sup> Nazareth Academic Institute, Nazareth, Israel<sup>5</sup> Oranim Academic College of Education, Qiriat Tivon, Israel<sup>6</sup> Institute for Neurology and Neurosurgery, Havana, Cuba

ADD/ADHD is the most common and most studied neurodevelopmental problem. Recent statistics from the U.S. Center for Disease Control state that 11% or approximately one out of every nine children in the US and one in five high school boys are diagnosed with ADD/ADHD. This number is thought to be increasing at around 15–20% per year. The US National Institute of Mental Health's Multi-modal Treatment Study has shown that medication has no long-term benefit for those with ADHD. To effectively address ADD/ADHD from within the framework of child public health, an interdisciplinary strategy is necessary that is based on a neuroeducational model that can be readily implemented on a large-scale within the educational system. This study is based on previous findings that ADD/ADHD children possess underactivity between sub-cortical and cortical regions. An imbalance of activity or arousal in one area can result in functional disconnections similar to that seen in split-brain patients. Since ADD/ADHD children exhibit deficient performance on tests developed to measure perceptual laterality, evidence of weak laterality or failure to develop laterality has been found across various modalities (auditory, visual, tactile). This has reportedly resulted in abnormal cerebral organization and ineffective cortical specialization necessary for the development of language and non-language function. This pilot study examines groups of ADD/ADHD and control elementary school children all of whom were administered all of the subtests of the Wechsler Individual Achievement Tests, the Brown Parent Questionnaire, and given objective performance measures on tests of motor and sensory coordinative abilities. Results measured after a 12-week remediation program aimed at increasing the activity of the hypothesized underactive right hemisphere function, yielded significant improvement of greater than 2 years in grade level in all domains except in mathematical reasoning. The treated group also displayed a significant improvement in behavior with a reduction in Brown scale behavioral scores. Non-treated control participants did not exhibit significant differences during the same 12 week period in academic measurements. Controls were significantly different from treatment participants in all domains after a 12-week period. The non-treatment group also demonstrated an increase in behavioral scores and increased symptoms of ADD/ADHD over the same time period when compared to the treated group. Results are discussed in the context of the concept of functional disconnectivity in ADD/ADHD children.

**Keywords:** attention deficit hyperactivity disorder, hemispheric function, rehabilitation, synchronized metronome, hemisphere-specific training**Citation:** Leisman G, Mualem R and Machado C (2013) The integration of the neurosciences, child public health, and education practice: hemisphere-specific remediation strategies as a discipline partnered rehabilitation tool in ADD/ADHD. *Front. Public Health* 1:22. doi: 10.3389/fpubh.2013.00022**Received:** 15 May 2013; **Accepted:** 12 July 2013;**Published online:** 25 July 2013.**Edited by:** Meir Lotan, Ariel University, Israel**Reviewed by:** Norma Beatriz Ojeda, University of Mississippi Medical Center, USA  
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\*Correspondence: Gerry Leisman, Department of Mechanical Engineering, The National Institute for Brain and Rehabilitation Science, ORT–Braude College of Engineering, Snunit 51 Street, P.O. Box 78, Karmiel 21982, Israel e–mail: gerry.leisman@staff.nazareth.ac.il

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