Introduction: The case of a 9-years-old boy with astatic myoclonic epilepsy will be discussed. In particular, we will present the impact of a neuropsychological and psychophysiological integrated treatment on executive functions, self-regulation, behaviour and school performances in the light of the clinical complexity of the case.
Objectives: 1. To accurately measure the relation among every neuropsychological and neurophysiological component and their contribution in determining the cognitive disability profile and the every-day reality adaptation. 2. To assess and to discuss the combined treatment outcomes in terms of efficacy and efficiency and the methodological implications in the frame of a neuroconstructivist model of progressive modularization.
Methodology: NFB Training (single channel at Cz): Thalpha and Theta inhibition; by the time we were submitting this study 20 more sessions had already been scheduled for this boy to enhance SMR and 15-18 Hz Beta. Neuropsychological rehabilitation: computer-based executive functions and working memory training 40 twice-a-week sessions: 20 sessions each treatment.
Results: Significant statistical and clinical results were obtained in both treatments with positive impact on cognitive, behavioural and educational variables. The outcomes were assessed after only 4 months of treatment by different raters and occurrence of important improvements were reported also in untreated cognitive functions.
Discussion: Results support clinical literature which reports, at empirical evidence level, maximum efficacy of combined therapy. Results achieved will be interpreted in the frame of Karmiloff-Smith's and Moscovich-Umiltà's modularization models: treatments could rely on mutual reinforcement deriving from neuroanatomical and neurofunctional common ground. A critical point of discussion, a starting point for further studies and for the creation of a decision flow chart is the possibility to assess the impact of every treatment and the priorities in the application of each intervention in relation to the subject global profile changing. There will also be the attempt to define a quasi-experimental design clinical research study.

Keywords: integrated approach, childhood epilepsy, intellectual development disability, neurofeedback

Paced Breathing with Biofeedback for Postural Control Improvement in Athletes

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Background: At the beginning of the 21st century Lehrer, Vaschillo&Vaschillo (2001) showed, that when a person breathes at so-called resonant frequency (about 6 breathes per minute) a high amplitude peak appears in heart rate variability (HRV) power spectrum at the 0.1 Hz. These oscillations causes resonance in cardiovascular system, and it is supposed to be useful for the treatment of depression, anxiety, panic disorder and other diseases (Hofman et al, 2005; Gevirtz, 2013; Lehrer&Gevirz, 2014).
We supposed that the biofeedback training with paced 6 per minute breathing will be useful for athletes, and will help them to improve their ability to control posture, emotions and finally to enhance their sport performance. Based on Lehrer, Vaschillo&Vaschillo protocol (2000, 2007) and Beauchamp et al (2012) application for sport psychology we organized a pilot practically oriented study.
Methods: Sixteen biathlon athletes (15-17 years old) took part in this study. For biofeedback (BFB) training the Thought Technology equipment was used. An athlete should breathe abdominally according to the pacer on the screen. Photopletysmogram (for HRV analysis) and breathing frequency and amplitude were recorded before, during and after BFB session. Shooting performance was tested on the special shooting simulator. For postural control assessment stabilometric equipment was used (Stabilan2.0). For further analysis pre- and

post-training data (HRV, stabilometric, shooting) were processed by statistical software (SPSS).
Results: After one session of 5 minutes abdominal breathing BFB training only six athletes had significant improvement of shooting performance. Despite the fact that it is not significant for the whole sample, there is a tendency for sports performance improvement after BFB training. Breathing at one's resonant frequency significantly improved postural control according to the stabilometric parameters in a simple stabilographic test, but not in Romberg test. HRV parameters were changing only during training, but not in post-training test comparing to pre-training test.

Keywords: heart rate variability, respiratory sinus arrhythmia, postural control, athletes

Changes in Biofeedback Stress Profile in Healthy Students After long-Term Mental Workload

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Introduction: Sympathetic nervous system plays a key role in connection between mental stress and negative health outcomes. Electrodermal activity (EDA) represents relatively direct marker of sympathetic activity, as the sweat glands are regulated solely by sympathetic innervation in contrast to most autonomic functions regulated by both branches of autonomic nervous system. Therefore, we aimed to evaluate the long-term effect of increased mental workload on EDA-linked stress profile in healthy students.
Methods: The EDA (μS) was recorded in 20 male university students (age 22.5±0.3 years, BMI 23.5±0.6) using ProComp Infiniti (Thought Technology Ltd, Canada) during stress profile: baseline (T1), Stroop test (T2), rest (T3), mental arithmetic (T4), rest (T5), negative emotion (T6), rest (T7). Duration of each period was 5 minutes. Examination was performed twice – at the beginning of term (P1) and a day before the last exam (P2).
Results: Significantly increased EDA was found in response to all the tasks (T2, T4, T6) as well as during recovery periods (T3, T5, T7) compared to baseline (T1) within both P1 and P2 ($p<0.001$ for all except T7 in P2, where $p=0.011$). Significantly decreased values of EDA were found in P2 compared to P1 ($p<0.001$ for T2, $p<0.01$ for T1,T3-T7).
Conclusions: The EDA was a sensitive psychophysiological marker of sympathetic arousal in response to acute stress. Increased EDA during complete stress profile could indicate persisting sympathetic activation even after cessation of stressor. Surprisingly, lower sympathetic activity was found after long-term mental workload. This finding could represent the effect of psychological coping mechanisms activation as well as an subtle alteration of complex allostatic reaction to stress. Detailed study may bring important information about the long-term effects of stress and pathophysiology of related health outcomes.
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Keywords: mental workload, autonomic nervous system, stress profile, sympathetic arousal

Sympathetic Arousal During Continuous Performance Task in Mental Disorders

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