Validation of Mendi neurofeedback device

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Abstract

Blood flow measurement is a new attractive method for measuring cortical brain activity in real time. New methods have developed rapidly over the past five years and validated against brain imaging methods such as functional Magnetic Resonance Imaging (fMRI) with good results, especially for recording activity in the prefrontal lobe that is related e.g., to executive function, impulse control, affect regulation and planning. (e.g., Moriguchi et al. 2017; VicosaBonetti et al. 2019). In recent years, flexible wireless equipment has been introduced and this year the Swedish company Mendi presents a consumer product for neurofeedback training at home, with the ability to measure blood flow and oxygenation. The advantages of this system compared to other methods in cognitive neuroscience are the possibilities of the system in studies outside of laboratory environments (Herold, 2018). In a recent study Mendi device was validated with a Biopac fNIRS100. The aim of the study was to investigate whether Mendi's wireless systems can provide reliable measurements of brain activity in relation to established laboratory equipment. In the study, 18 people performed a standardized cognitive test that is known to activate the brain's prefrontal lobes. The cognitive test was done while measuring activity with both the Biopac and Mendi equipments. The measurements lasted a total of 30 minutes per person and included about 52,000 measurement values. The results showed a very good agreement between the brain activity measurements for the two equipment’s. In summary, it can be said that Mendi's system is at least as good as an established laboratory equipment for measuring blood flow in the frontal lobes.

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