Master thesis opportunity

Evaluation of interlimb reflex behaviour during combined Action Observation and Motor Imagery of walking

Background:
Action observation in combination with motor imagery (AOMI) is a powerful technique that originated in sports psychology and is used in rehabilitation, in particular in neurorehabilitation. The mechanisms of both techniques are based on brain area activation similar to movement execution. It was shown that seeing another person walking recreates a mental representation of the observed gait which can also be studied by assessing the lower limb reflex behaviour. During the real performance of different movements (e.g. walking, standing with arm swing, sitting and writing) it has been found that there is a task-dependent interlimb reflex-behaviour. This points to the fact that there is a task-dependent linkage between the neuronal circuits controlling arm- and leg movements. So far, it has not been investigated whether such an interlimb linkage can be evoked through AOMI.

Aim: The aim of the project is to investigate the possible existence of interlimb reflexes due to AOMI of walking and thereby to obtain a more detailed understanding of the underlying neurophysiological processes of this rehabilitation method.

Tasks:
The successful candidate will recruit and test about 15 neurological patients with movement disorders of the lower limb and the same number of healthy age-matched participants using electrical nerve stimulation and EMG-recordings during AO of short video clips presenting a walking figure and concurrent MI. Furthermore, she/he will be responsible for the processing and analysis of the data under supervision. A study protocol will have to be proposed to the research group and an application submitted to the local ethical committee. Recruitment, assessment and outcome analysis of will be organised by the candidate.

Requirements:
- Interests in neurophysiological measurements
- Proficiency in use of MS Office
- Basic knowledge of statistical analysis with appropriate software
- Expertise in Matlab coding would be appreciated but is not necessary
- Highly motivated and team-oriented working morale

Offer:
- Introduction and supervision throughout the entire project
- Exciting opportunities in an interdisciplinary environment of clinical research and rehabilitation
- Possibility to visit various departments involved in rehabilitation of neurologic and orthopaedic patients.

Time period:
Begin is negotiable. Duration: 6 to 9 months.

For further questions, please contact Dr. F. Behrendt, Research Department, Reha Rheinfelden (f.behrendt@reha-rhf.ch). To view other opportunities at our department, go to: https://www.reha-rheinfelden.ch/ueber-uns/wissenschafter/themenboerse-praktika