The role of the cerebellum in neuropsychiatric disorders (NPD) and neurological diseases

Area: Experimental Neuropsychology and Neuroscience

Ethic Permission: 2022-01799-01

Contact: If you are interested in writing your thesis within our project or have questions about the project, please contact Maurizio or Amelia Hansson amelia.hansson@med.lu.se

Supervisor: 1) **Susanna Vestberg**, Ph.D., Lic. Psychologist, Specialist in Neuropsychology

2) **Maurizio Cundari**, Ph.D. student, Lab. of associative learning, faculty of medicine, Lic. Psychologist, PTP in neuropsychology maurizio.cundari@med.lu.se

Project

We at the unit for Associative Learning (Faculty of Medicine at Lund University) have an ongoing research project where we use neurocognitive tests to increase the understanding and diagnosis of neuropsychiatric disorders and neurological diseases. Our focus is mainly on NPD and we have already tested over 100 people with ADHD and/or autism. We are now looking for psychology students who can help us with statistical analysis to develop and improve some neurocognitive test **(data are already collected).** You can choose on which cognitive domain (visuospatial abilities or executive functions for example) or psychological function (emotions recognition or inhibitions ability for example) you are interested in/ want to focus, our battery is pretty large. Some tests are new in this field (motor tests, digital, CPT, paper and pen). We are also open to hear your own ideas or suggestions. If you know how to use deep learning machine and artificial intelligence is plus.

Writing the thesis

You who are interested in participating in the project can use all the data we collected in your thesis and all the data you collect will be used in our articles. Some of the tests are from well-established test batteries such as WAIS-IV, WMS III, and D-KEFS. While others (motor tests, digital, CPT, paper and pen) are experimental that we develop and evaluate within the project.

Benefits

- Access to a large amount of data from many neurocognitive tests that you can use for your own questions and analyzes in your degree project.
- In-depth knowledge of neuropsychiatric examination and the instruments used.
- Contribute to research that aims to increase the understanding of neuropsychiatric disabilities.
- Something you can use on your CV.
- Increased possibility of getting your thesis published.

Information about the project

We published a review, you can read it if you want to know more: [Frontiers | Neurocognitive and cerebellar function in ADHD, autism and spinocerebellar ataxia (frontiersin.org)](https://www.frontiersin.org/articles/10.3389/fnsys.2023.1168666/full) - https://www.frontiersin.org/articles/10.3389/fnsys.2023.1168666/full

Our project puts an increased focus on the cerebellum's role in neuropsychiatric impairments and neurological diseases. The cerebellum has received less attention in clinical research than other parts of the brain. Many studies show that the cerebellum has an important role in motor control, but it is also involved in several cognitive functions such as attention, language, and emotional control.

One of the goals of this project is to improve the differential diagnosis of neuropsychiatric impairments through the use of neuropsychological tests that are assumed to be related to cerebellar activity. We also want to increase understanding of the importance of the cerebellum for NPF. In ASD and ADHD, the neuropsychological profile shows a more pronounced deterioration of executive functions compared to other cognitive functions, and the patients also show deficits regarding executive functions in daily life. Marked impairment of working memory, planning ability, cognitive flexibility and verbal fluency has been observed in patients with ADHD. In addition, difficulties in visuomotor integration and coordination, where the cerebellum plays an important role, have been demonstrated in the patient group. The study can provide an improved understanding of the cerebellum and how it contributes to various neuropsychiatric conditions and neurological diseases.