Project: Neural correlates of proactive control in depression

Funding: FWF / German Research Foundation

Cooperation partner: University of Bonn, Germany (U. Ettinger), University of the Balearic Islands (P. Montoya)

Depression is a widespread mental disorder that substantially impairs the wellbeing and quality of life of affected individuals, and imposes a major burden on healthcare systems. Deficits in cognition, i.e., attention, memory, planning and decision-making, are frequently observed in people suffering from depression. In this project, a particular aspect of cognition will be examined in association with depression, so-called proactive control, which refers to the ability to direct attention to expected events such that they can be anticipated and responded to in an optimal manner. Literature findings suggest that this ability is impaired in depression. In this project, proactive control will be investigated in an eye movement experiment (antisaccade paradigm). One of the main aims is to identify the brain processes underlying proactive control, as well as possible impairments related to depression. Whether the extent of any impairment in proactive control is associated with affective, i.e., emotion-related, features of the event that is to be anticipated and responded to will also be examined. Patients with depression, and healthy controls, will perform a task in which pictures of faces displaying different emotions (happy, angry, sad, anxious or neutral) are presented. The pictures must be responded to with particular eye movements (antisaccades / saccades). During the performance of the task, different methods will be applied to measure brain activity. At UMIT Tirol (Hall in Tirol), electroencephalography (EEG) is used to investigate rapid brain processes with a high time resolution. At the University of Bonn, functional magnetic resonance imaging (fMRI) is used to examine activity in particular brain areas during task performance. At both universities, eye movements are recorded by infrared (eye tracking) cameras. The overall aim of the project is to improve our understanding of the cognitive and emotional processes involved in the genesis of depression, and to provide insight into the cerebral functions underlying these processes.

Numerous students of UMIT Tirol are involved in the project within the context of their bachelor and master theses; moreover, the project encompassed the PhD of Christoph Haas.

Publications from the project

Duschek, S., Sutil, A.J., Piwkowski, P., Rainer, T., & Ettinger, U. (2025). Affective Modulation of Proactive and Reactive Control: An ERP Study Using a Precued Antisaccade Task. PsyCH Journal. doi: 0.1002/pchj.70002

Duschek, S., Piwkowski, P., Rainer, T., Vorwerk, J., Riml, L. & Ettinger, U. (2025). Neural Correlates of Proactive and Reactive Control Investigated Using a Novel Precued Antisaccade Paradigm. Psychophysiology, 62, 2, e70015. doi: 10.1111/psyp.70015