## ABSTRACT FOR THE GENERAL PUBLIC

Survival of any natural being implies its ability to react to important changes in the environment but also to ignore those aspects that are irrelevant. Obviously, the needs of organisms vary, but different circumstances also require different types of adaptive behavior. For example, when driving on the highway, moving objects like cars and loud sounds preferably attract our attention and play an important role in guiding our behavior. However, when for our studies we are trying to read a book in a public library we often have to connect new information with old, memorized information, while irrelevant sounds from the outside or people walking around are preferably ignored. The cognitive function that relates to this ability to select specific types of information and ignore other types of information to guide our behavior is generally defined as attention. In this project, the focus is on a brain-based model that tries to explain how we humans are able to focus our attention on events happening in the outside world related to what we see (vision), hear (audition), or feel (somatosensory perception), or the inside world (our thoughts or memories of specific sensory events). The brain-based model proposes that the parietal cortex influences processing in brain areas that are related to the different senses and different sensory memories, but that the relation between these areas differs depending on their relevance. By using the electroencephalogram (EEG; which can be considered as a direct online index of electrical brain activity), and measuring the EEG from multiple electrodes, we can examine whether the dynamic nature of attention is reflected in a different coupling between specific brain areas in different experimental conditions. Furthermore, we want to establish whether the most frontal part of our brain, the prefrontal cortex, plays a crucial and leading role in establishing these different couplings. The outcome of the project will advance and broaden our knowledge on attention and its underlying brain-based mechanisms, and may additionally provide crucial information for clinical conditions in which major problems with attention have been established, such as schizophrenia, but also for less disruptive conditions like attention deficit hyperactivity disorder or specific forms of dyslexia.