

SleepTrip as a Tool to Create Analysis Pipelines for Investigations of Polysomnography in Clinical Populations

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Sleep is affected and thus recorded in many clinical populations. These polysomnographic recordings, however, remain poorly utilized due to a lack of analysis tools that are both comprehensive and available.

SleepTrip is an open-source, Matlab-based toolbox that is dedicated to create analysis pipelines of polysomnographic data expanding the widespread standards of the FieldTrip toolbox. Using the results of larger polysomnographic datasets of clinical populations (e.g. major depressive disorder or insomnia) as an example, I will demonstrate how SleepTrip can facilitate the creation of sleep EEG analysis pipelines that are easy to replicate on other datasets and allow for the systematic investigation of basic components in full-night sleep. This will have the potential to inform precision mental health through a lens of computational psychophysiology of sleep.

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MT-aIAT: The Convergence of RT, Mouse Tracking and Computation in Memory-Detection aIAT

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The detection of concealed memories has captured a broad interest of psychologists and tended to be more widely used in forensics, clinical psychiatry, and other fields of practice. As a variant of the Implicit Association Test (IAT) (Greenwald et al., 1998), the validity of the autobiographical Implicit Association Test (aIAT) has been demonstrated. However, the counter-aIAT strategies are also possible to beat the aIAT (Verschuere et al., 2009). In the present study, we proposed a modified computer-based aIAT paradigm, MT-aIAT, which integrated mouse-tracking with aIAT. We then practiced MT-aIAT in a mock crime scenario to demonstrate further how the aIAT can detect concealed autobiographical memories. 59 healthy students (27 male, Mage = 21.36) participated in this experiment. Participants were assigned to steal a credit card and then performed the aIAT while the mouse tracker was recording their motor response. Participants were required to move the mouse quickly and accurately in the task, otherwise, a reminder would appear to urge them to respond as quickly as possible. For simulations of Reaction Time, the connectionist model used in the present work is a simple recurrent neural network (RNN), consisting of four artificial neurons that represent four features (the crime-relevant event, the crime-irrelevant event, true, and false). Then, the drift diffusion models (DDM) are established based on the two-alternative forced choice tasks. The results of RTs indicated a congruency effect, regardless of block order or modality. The mouse dynamic indices also demonstrated the typical congruency effects of the MT-aIAT. The overall IAT effect in RTs and the mouse geometric indices (e.g. MAD and AD) was well observed irrespective of the modality, indicating the reliability of MT-aIAT task in detecting the occurred event. The MAD and AD indices revealed a pattern of the same congruency effect in both groups. This re-current network (Hebb, 1949) offered us a way to quantify the sensory evidence. with combination of

DDM, we can simulate the behavioral performance on the IAT to measure the quantity of implicit bias. Furthermore, we also observed a peak at around 60th-time bin (out of 101-time bins) in congruent trials of the incongruent block first group. It might be a recurrent resonance of autobiographical events and indicated the existence of implicit bias. The potential implications of the MT-aIAT to identify both true memories and true intentions, the combination with computational modeling approach, and guidelines for building an effective MT-aIAT are further proposed.

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Symposium

Symposium Title: The Regulation of Affective and Social Behaviors: Neurophysiological Substrates

Chair: Jiajin Yuan
Sichuan Normal University

Effective self-regulatory function is not only important to humans' goal maintenance but is also of particular significance to people's adaptation to the changing environments. Self-regulation involves both internal processes such as affective/motivational arousal, and external processes of various social behaviors that support human's social lives, like cooperative/competitive behaviors. There are rising number of studies over recent years that examine the self-regulatory processes from multiple perspectives as described above, using behavioral, electrophysiological as well as neuroimaging approaches. This symposium proposal has invited renowned experts who work in affective and social neuroscience using diverse approaches, for the purpose of reflecting the most state-of-the-art progresses concerning self-regulation of affective and social behaviors. Specifically, the topics of this symposium proposal range from the regulation of emotional arousal, the suppression of emotional memories, to the regulation of appetitive motivation (e.g. craving for internet gaming) and to the modulation of cooperative & competitive behaviors in multiple-person, social contexts. Also, the topics included for this proposal cover diverse research approaches, from behavioral, multimodal EEG/ERP to fNIRS hyperscan and fMRI. This also provides an important forum for researchers, faculties and students with different backgrounds to communicate, learn and develop collaborative and career opportunities.

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Disturbed Craving Regulation to Gaming Cues in Internet Gaming Disorder: Implications for Uncontrolled Gaming Behaviors

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The ability to control craving for games is very important to abstain from Internet gaming disorder (IGD) and abundant clinical evidence has suggested that craving dysregulation is the essential pathogenesis for IGD. However, the neural mechanism underlying this feature remains unclear. Subjective evaluation and fMRI data from 44 participants (IGD participants: 21; recreational Internet