

stroke prevention therapies in regard to specific neuropsychological factors. Starting points of prevention programmes will be discussed. Our results may improve the quality of care after stroke and may reduce the risk of future cerebrovascular events.

The relationship between sleep and memory in post-traumatic stress disorder

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Research has shown that in normal individuals sleep is critical to memory formation. Successful memory consolidation during sleep is contingent on slow-wave sleep (SWS), REM sleep and the successful transition of stages across the night. In PTSD, both sleep and memory processes are disrupted, but no previous study has examined whether these two variables are inter-related. This study aimed to determine whether disrupted sleep is a mechanism underlying declarative memory deficits in PTSD - investigating whether memory consolidation during sleep is disrupted in PTSD diagnosed individuals in comparison with controls. Participants were recruited to one of four groups - PTSD ($n = 16$), trauma-exposed non-PTSD ($n = 15$), depression ($n = 15$) and healthy controls ($n = 14$). After screening, participants attended the Vincent Pallotti Hospital sleep laboratory for one night. Participants completed declarative and procedural memory tasks before and after an 8 hour sleep period. Declarative memory performance was assessed using a story recall task. Procedural memory performance was measured using a finger tapping task. Sleep variables such as total sleep time, sleep latency, number of awakenings, and REM and SWS percentage were measured using sleep adapted EEG. Results were analysed using one-way ANOVA, for sleep and memory variables, and regression analysis. PTSD participants retained significantly less information on a declarative memory task than healthy controls after sleep. Further disruptions in SWS predicted poor memory performance in at least one domain of declarative memory. Overall results show some support for the disruption of memory consolidation during sleep in PTSD.

Emotional context impacts limbic striatal reward prediction error

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A frequent experience in every daily life is the impact of emotional context on learning processes. Indeed, several neuroscientific studies have reported sub-cortical and cortical network activity associated with reward prediction errors (RPE) during instrumental learning. Nevertheless, the influence of emotional context on RPEs has not yet been studied. Here we conducted a probabilistic instrumental learning task with four spatial options differing in reward probabilities. While 18 participants were instructed to identify the most rewarding option, a face was presented on each of the four spatial locations. The emotional expression of the faces varied block-wise, yielding to a happy, fearful or

neutral emotional context for the learning task during fMRI acquisition. A reinforcement learning model was fitted to each participant's choices and a trial-by-trial RPE was computed and used in fMRI analysis. The results showed a replication of the previously reported sub-cortical and cortical network representing a RPE. Moreover, a main effect of emotional context appeared exclusively in the limbic striatum. This effect was driven by the direct comparison of fear versus happy blocks. Furthermore, this contrast correlated positively with the arousal rating of fear stimuli. In conclusion, this study demonstrates, for the first time, stronger encoding of RPEs during a fearful-emotional context in the ventral part of the striatum showing that unexpected reward is coded more strongly in an arousing and emotional negative context.

Neural correlates of dissociative states in patients with borderline personality disorder

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A profound negative influence on psychological processes based on learning and memory can be found in subjects suffering from frequent dissociative experiences. We recently demonstrated a significant reduction of fear conditioning and emotional learning processes during dissociative states. To investigate dissociative states under experimental conditions, we used the script-driven imagery technique, a method previously shown to be capable for inducing dissociation. 15 unmedicated patients with borderline personality disorder were investigated during fMRI. Neutral and stressful autobiographic scripts were both presented three times and dissociative symptoms as well as pain sensitivity were assessed after each script presentation. After the stressful scripts, dissociation scores were significantly higher as compared to the neutral scripts. Pain sensitivity after the stressful scripts was significantly lower in comparison to the neutral scripts. On a neural level, we found altered prefrontal activity during stressful as compared to neutral script presentation. Patients with co-occurrent PTSD showed increased activity in the right insula and the left cingulum. Script-driven imagery reliably induced dissociation in patients with borderline personality disorder. Our data support previous neural models of dissociation and resemble findings from earlier studies in PTSD. Further studies will focus on alterations in learning and memory processes during induced dissociative states.

Negative expectation about pain correlates attentional biases towards pain-related information

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It is suggested that attention might play an important role in pain diseases. A few published studies have investigated whether pain patients show attentional biases (AB) toward pain-related stimuli, but with controversial findings. All these investigations employed only words and pictures that directly described pain. In this study, we applied stimuli that indicated the coming of pain to determine (a) whether people show AB to pain-related information, and (b) whether this bias was related to pain

itself or the expectation of pain. 21 patients with trigeminal neuralgia (TN), 16 pain-free close relatives of these patients (either spouse or child), and 21 pain-free subjects, who had no relationship with these patients, participated in our study. Two dot probe tests were taken by these subjects. In one test, face pictures with painful or neutral expressions were used. In another test, two types of conditioned stimulus (CS), i.e. certain CS (100% pain-paired) or uncertain CS (50% pain-paired) were employed. The results demonstrated that the TN patients showed a bias towards the painful face, the certain CS and the uncertain CS. Their close relatives, however, only showed bias toward uncertain CS. As expected, the healthy control showed no bias towards any of these stimuli. More interestingly, the patients' negative expectation about their own pain conditions correlated the ABs they showed. We speculate that the negative expectations might be strengthened once they are confirmed. The interaction between expectation and AB might play an important role in the development, and maintenance of chronic pain conditions.

Eye-tracking recordings and psychophysiological reactions

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Nowadays the techniques that study consumers' behaviour can take advantage of neuroscientific findings. That is why researchers have initiated discussions on a new research field, Neuromarketing. Although this is a promising field, many issues about the use and application of neuroscientific tools, methods and technologies are still being debated in the scientific community. It is not evident yet how to apply the results and methods provided by neuroscience and psychophysiological research into the practice of marketers, even though other social sciences, such as economics, have already integrated neuroscience into a new research field called neuroeconomics. To add empirical data to these topics, we showed 30 IULM students 20 advertising flyers. They were asked to come to the Brain and Behavior Lab on IULM University campus and sit in front of a computer while their neuro and psychophysiological reactions were recorded with non-invasive sensors: namely, EEG, EMG, Galvanic Skin Response, Heart Rate and Respiration. The recording device was synchronized with an eye-tracker system, in order to measure the pupil dilation, as an additional contactless indicator of emotional reactions, and the tracking of subjects' gaze pointing to the PC screen. Firstly, the data analysis revealed that the most successful flyer, according to the expressed opinions of the students, is characterized by a specific pattern of neuro and psychophysiological signals. In contrast, the least successful flyer was associated with another specific pattern. These data results might help in designing a procedure to test advertising flyers based on neuro and psychophysiological reactions.

Trait-judgments about self in a comparative context: An fMRI study

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Self-concept is developed through the process of interaction and communication with others. Accu-