Methods: Here, we recorded electroencephalography (EEG) from a sample of 20 participants in a semantic conditioning experiment. In the acquisition phase the participants were presented with sequences of words from two semantic categories paired with tactile stimulation followed by presentation of a neutral sound (US-) ((e.g., animals -> left hand vibration -> US-, clothes -> right hand vibration -> US-). In the test phase the association violated in 50% of trials which followed by a presentation of a loud noise (US+). The participants were only instructed to listen carefully. On the basis of self-reported contingency awareness, twenty participants were divided in aware (N=12) and unaware (N=8) group.
Results: The aware group expressed a non-lateralized effect of alpha-beta (12-23 Hz) suppression along with a more negative CNV at central channels preceding presentation of the vibration (main effect of Group). Also, CNV was more negative in expectation of US+ comparing with expectation of US- in the aware group but not in the unaware group.
Conclusions: The results indicate that contingency awareness is accompanied by neural patterns reflecting expectation as can be seen in the suppression of somatosensory alpha-beta activity before expected presentation of the vibration as well as in CNV in expectation of an aversive event.

Keywords: EEG; ERP; Fear conditioning; contingency awareness

EPP1067

Complex sympathetic arousal during negative emotional stress

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Introduction: The autonomic nervous system (ANS) plays a key role in maintenance of the homeostasis and adaptability of the body to different stimuli. The disturbances of ANS, especially sympathetic dysregulation in stress response, are associated with various disorders.
Objectives: Thus, we aimed to study the sympathetic arousal in response to negative emotional stress and during recovery using heart rate variability (HRV) nonlinear analysis (symbolic dynamics parameter 0V%) and skin conductance level (SCL) as sympathetically-mediated indices in healthy students.
Methods: Seventy students (age: 23.1±0.2yr., 39 females) were examined during complex stress response: baseline – negative emotional stress – recovery. RR intervals (for HRV analysis) and electrodermal activity were continuously recorded during each period lasting six minutes. Evaluated parameters: HRV nonlinear analysis - symbolic dynamics index 0V% as cardiac sympathetic index, skin conductance level (SCL) as sympathetic cholinergic index.
Results: Regarding electrodermal activity, the parameter SCL significantly increased in response to negative emotional stress ($p<0.001$) and remained higher after stress (recovery phase, $p<0.001$). Symbolic dynamics index 0V% was without significant changes.
Conclusions: Our findings revealed increased sympathetically-mediated index SCL in response to negative emotional stress and in recovery phase indicating higher sympathetic arousal during complex stress response in young people. Surprisingly, cardiac sympathetic index 0V% was not sensitive to detect discrete changes in sympathetic arousal to negative emotion. We suggest that detailed knowledge about complex sympathetic regulatory mechanisms to emotional stress in healthy probands represents the first step for understanding of pathomechanisms leading to abnormal stress response in mental disorders.

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Keywords: sympathetic nervous system; electrodermal activity; heart rate variability; negative emotional stress

EPP1069

Age-related differences in processing speed in children can be explained by heterochronicity of human brain development

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Introduction: Age-related differences in the processing speed have been observed in a great variety of tasks. In spite of the great amount of researches in this area, we know relatively little about the nature of this developmental tendency.
Objectives: The aim of this study was to assess whether age-related differences in reaction time (RT) can be explained satisfactorily in terms of a global age-related differences in processing speed alone.
Methods: The sample consisted of 48 4-year-olds, 50 5-year-olds, 46 6-year-olds children, and 35 adults. To investigate processing speed in children and adults we used the test battery consisted of three types of RT tasks: simple, discrimination, and choice.
Results: We have revealed clear age-related differences in processing speed not only between children and adults but also between three age groups of children. However, using transformation method proposed by Madden et al. (2001) and Ridderinkhoff & van der Molen (1997) we have revealed that there are not only global age-related differences but also process-specific age-related differences in processing speed. Among children, age-related differences larger than predicted by the global difference hypothesis were evident when tasks required spatial orientation discrimination and stimulus–response rule complexity, but not for response suppression or reversal of stimulus–response contingencies.
Conclusions: It can be assumed that the observed process-specific, age-related differences in processing speed generally can be explained by the principle of heterochronicity of human brain development (Casey et al., 2005).

Keywords: processing speed; Brain Development; heterochronicity

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