

the males was unbearable. Experiments were carried out on three conditions, where one female participant was approached by one male stranger, one female by two males, and two females by one male. Eyeblinks were identified with the video recordings of the participants' faces, and heart rates were measured with the ECG recordings. The results showed that the longest distance was recorded when the participants were approached by two strangers. Whereas the eyeblinks occurred most frequently when the strangers came as near as one meter from the participants, there have hardly been found any differences among the three conditions. Moreover, the participants' heart rates decreased continuously throughout the approaching. In conclusion, the spontaneous eyeblinking can serve as a reliable physiological index exhibiting the emotions aroused by social factors.

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EEG COMPLEXITY IN RELATION TO WITHDRAWAL MOTIVATION LEVEL

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Descriptors: motivation, EEG, correlation dimension

The research was conducted on 17 healthy volunteers, who were divided into two groups, according to their motivation (withdrawal) level – one group with a high motivation level (10 persons) and one group with a middle motivation level (7 persons). EEG was recorded during both a resting state and intellectual task solving. Then EEG was analyzed, using the TISEAN package. Correlations were evaluated for 8 EEG lead positions (symmetrical frontal, temporal, parietal and occipital lobes in the left and right hemispheres) with embedding dimension = 10. Though we expected specific features, which depend on motivation level, in frontal areas, main effects were observed in parietal lobes. In both the high and middle motivation level groups, there was a statistically significant increase in correlation dimension values in both parietal lobes. But in the group with middle motivation level, the correlation dimension value, which was lower in the right parietal lobe compared to those in the group with high motivation level (7.46 and 7.70 respectively), the effect was greater for the intellectual task (8.04 and 7.95 respectively). We hypothesize that complexity of electrical processes in the parietal cortex may depend on motivation level.

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ELECTROCORTICAL CORRELATES OF EMOTIONAL WORKING MEMORY LOAD AND STARTLE REFLEX MODULATION

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Descriptors: working memory, startle, EEG

Both working memory (WM) and emotional regulation have been considered important functions of the prefrontal cortex. This EEG study examined which PFC regions are active during the maintenance of emotional versus neutral information in WM and how this relates to the modulation of protective reflexes. Positive and negative nouns (comparable in arousal, but more aroused than neutral words) had to be memorized and maintained during a Sternberg-type WM task with high and low memory load. The modulating effects on acoustic startle were studied during maintenance, that is, the absence of any stimulus. Sixty-four-channel EEG (Synamps, Neuroscan) data were analyzed time-locked to the last stimulus. Behavioral data showed slower RTs and a greater number of errors in trials without startle.

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NEAR-THRESHOLD STIMULUS PROCESSING IN PRIMARY AND SECONDARY SOMATOSENSORY CORTEX - AN MEG STUDY.

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Descriptors: MEG, somatosensory, near-threshold stimuli

In the current study we were interested in temporal activation patterns for conscious and subconscious processing of near-threshold tactile stimuli in somatosensory areas. Due to the weak evoked responses, we chose an indirect approach to study the processing of near-threshold stimuli by investigating the impact of near-threshold stimuli on the cortical processing of succeeding supra-threshold test stimuli in a paired-stimulus paradigm. We hypothesized that responses evoked by the test stimuli are reduced by preceding near-threshold stimuli if the underlying neuronal substrate is still refractory. In order to probe the time course of cortical activation patterns of near-threshold stimuli, stimulus pairs were presented with interstimulus intervals (ISI) of 30, 60 and 150 ms. The extent and duration of near-threshold stimulus processing and differences due to conscious perception were evaluated based on the extent of attenuation of neuro-magnetic responses to test stimuli in the different stimulation conditions. Attenuation of test stimulus responses in SI were only observed for ISIs >60 ms, whereas in SII the effect outlasted the ISI of 150 ms. Differences due to conscious perception of the near-threshold stimuli were only observed in secondary somatosensory cortex with stronger de-

creases for perceived than for missed near-threshold stimuli. Our data suggest that stimulus information of near-threshold tactile stimuli is processed very briefly in SI, whereas the occupancy of SII points to its role in temporal integration and conscious perception of sensory input.

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MEETING MORE CRITERIA OF THE METABOLIC SYNDROME ASSOCIATES WITH REDUCED GRAY MATTER VOLUME

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Descriptors: metabolic syndrome, voxel-based morphometry, gray matter volume

Components of the metabolic syndrome (MetS) have not only been related to prospective risk for cardiovascular and diabetic disease endpoints, but also alterations in gross brain morphology. Here, we examined whether meeting an increasing number of MetS criteria covaried with a greater reduction in regional gray matter volume, particularly in corticolimbic areas subject to metabolic dysregulation. Participants were 96 community volunteers aged 32–54 years. Voxel-based morphometry (VBM) was used for whole-brain analysis of structural magnetic resonance images, wherein gray matter volume was quantified. Criteria of the MetS were based on the 2001 National Cholesterol Education Program Guidelines. In sum, 38 participants met no criteria; 26 met 1 criterion; 17 met 2 criteria; and 15 met 3 or more criteria. We used a 0–3 ordinal variable for our analyses of regional gray matter volume, such that 0 = meeting no criteria, 1 = meeting 1 criterion, 2 = meeting 2 criteria, and 3 = meeting 3 or more criteria. This ordinal variable was then entered as an explanatory factor in a whole-brain regression analysis of gray matter volume adjusting for age, sex, and total cerebral volume. We found individuals meeting a greater number of MetS criteria showed reduced gray matter volume in the pregenual anterior cingulate, posterior insula, and precuneus ($t_s > 3.2$, $p_s < 0.001$, $k_s > 373$). These findings extend epidemiological evidence on the associations between the MetS and peripheral target organ damage by suggesting that the brain may be equally vulnerable to the pathophysiological sequelae of this syndrome.

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BRAIN VOLUME ASYMMETRIES BETWEEN HOMOLOGOUS REGIONS OF BOTH HEMISPHERES IN NORMAL SUBJECTS

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Descriptors: normal subjects, brain volume asymmetries, anatomical MRI

Objectives: To evaluate the relation between the volumes of 54 symmetrical regions of both brain hemispheres. Methods: Anatomical MRIs of 237 normal subjects were obtained. Automatic classification of 54 structures in each hemisphere was obtained. Student *t*-tests to compare the volume of homologous brain regions were used. Multivariate comparison was performed using Hotelling's T2 test. Brain volumes between Cuban and Montreal Neurological Institute databases were compared. Structures with the highest correlation values were used to define a brain network. Results: There was a highly significant difference between left and right volumes in normal subjects. Normative Cuban volume values were similar to those reported in the Montreal Neurological Institute database. There is a relationship between handedness and correlation values between different brain structures. Sex differences in asymmetries between the two hemispheres were found. Conclusions: There is a high quantity of volume asymmetries between homologous regions of left and right brain hemispheres. It appears there is an influence of handedness on the correlation of brain structures. Relevance: Normative data can be used in order to compare subjects who could be evaluated for different suspected pathological conditions.

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FEEDBACK PROCESSING IN A TIME-ESTIMATION TASK: AN FMRI STUDY ON TASK VALIDITY

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Descriptors: feedback processing, task validity, fMRI

Performance monitoring is a prerequisite for goal-directed behavior. When a person detects an error or when he receives negative feedback, he can adjust his behavior in order to reach his goal. Using functional MRI, the current study examined the neural circuitry implicated in the processing of performance feedback in a time-estimation task. More specifically, the focus was on the task-relevance of the feedback provided to participants ($N = 30$; 22 female, aged between 19 and 69). The feedback consisted of a happy face following an estimate within the target time interval and an anxious face when the estimate was outside the target interval. When feedback was negative the gender of the face informed the participant whether the estimate was too short or too long, enabling the participant to adjust performance in the appropriate direction. The faces were presented