P-06-062

The examination of semantic access to abstract and concrete words by means of a priming paradigm

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Introduction: Subgroups of patients with schizophrenia or dementia are known to show distinct impairments in semantic memory for concrete words (e.g., shoe). Despite the fact that differences in the processing of concrete versus abstract (i.e., motive) words are well-described, not much is known, though, on semantic impairments for abstract (e.g., motive) words in these patients. Therefore, we aimed to establish a paradigm that is useful to investigate concrete and abstract semantic memory and disentangle the underlying neuronal correlates. This paradigm was firstly tested in young healthy subjects.

Methods: The subjects performed a lexical decision task implemented in a semantic priming paradigm, a suitable tool for investigating semantic processes. The paradigm consisted of abstract and concrete noun–noun word pairs, either semantically related or non-related and pronounceable non-words. Subjects were asked to indicate via button press whether the second word was a word or non-word. Concrete and abstract conditions were randomly intermixed. A short stimulus onset asynchrony (SOA) of 250 ms minimized controlled processing strategies, such as semantic prediction and matching. The dependent variables of interest were reaction time (RT) changes to related and non-related words in the abstract versus concrete condition.

Results and Discussion: All subjects showed significant priming effects (i.e., RT decrease in related compared to non-related words), both for the abstract and the concrete condition. An expected stronger priming effect for abstract compared to concrete words did not reach the significance level, although a positive tendency could be observed. This may be due to the small sample size. Taken together, the results show that our semantic priming paradigm is suitable to investigate processes in the abstract and concrete semantic system. It can further be considered to combine this paradigm with neurophysiological methods.

P-06-063

Neuropathological changes in geriatric depression and Alzheimer's disease with co-morbid depression

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Introduction: The hallmark pathological changes in Alzheimer's disease are abundant plaque and tangle formation, especially in the temporal lobes and hippocampus. At the same time, there is increasing evidence that major depression may interact with neuropathological processes in Alzheimer's disease. Recent evidence shows both increases in the number of neuropathological changes in Alzheimer's disease patients with a history of recurrent major depression, and evidence for Alzheimer's disease-related neuropathological changes in patients with geriatric major depression.

Methods: Neuropathological ratings from the Consortium to Establish a Registry in Alzheimer's Disease battery were compared in 401 brains of Alzheimer's disease patients with co-morbid depression and 3,817 brains of Alzheimer's disease patients without co-morbid depression from the National Alzheimer's Coordinating Center data base. In addition, ratings from the "Early Neurobiological Changes in Alzheimer's disease" data base were compared in 36 brains of older adults with geriatric major depression, 30 healthy controls, and 102 Alzheimer's disease patients with and without co-morbid depression

Results and Discussion: Brains of Alzheimer's disease patients with co-morbid depression showed higher levels of both cortical plaque ($P < 0.001$) and tangle ($P < 0.001$) formation than brains of Alzheimer's disease patients without co-morbid depression. Brains of patients with geriatric major depression showed higher levels of both cortical plaque ($P < 0.05$) and tangle ($P < 0.005$) formation than brains of healthy controls. Results remained stable when controlling for age, gender, level of education, and other medical co-morbidities. In Alzheimer's disease, the presence of depression co-morbidity corresponds to increases in Alzheimer's disease-related neuropathological changes beyond effects of age, education, and medical co-morbidities, suggesting a direct interaction between major depression and the neuropathological processes in Alzheimer's disease.

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P-06-064

Cognitive function in the early and late initial prodromal state: Where do subjective and objective deficits meet?

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Introduction: Cognitive disturbances have been demonstrated in potentially prodromal subjects in both objective, i.e., neuropsychological, as well as subjective, i.e., psychopathological studies. Yet, the relation between subjective and objective cognitive deficits and to different prodromal states is unclear. We, therefore, explored interactions between subjective and objective cognitive measures in different prodromal states.

Methods: In subjects suffering from an early (EIPS; $n = 33$) or late initial prodromal state (LIPS; $n = 69$), subjective and objective cognitive deficits were assessed with the Schizophrenia Proneness Instrument and a comprehensive neuropsychological test battery.

Results and Discussion: EIPS subjects were widely less impaired than LIPS subjects, though this was more pronounced in psychopathology. Subjective and objective cognitive deficits were unrelated, except for significant correlations between time-limited neurocognitive speed measures and subjectively reduced stress tolerance, especially in EIPS subjects. Subjective and objective cognitive deficits are generally unrelated in the psychosis prodrome, thereby carrying the potential to add valuable complementary information for prediction. However, possible associations between the two levels might be better detectable in the less impaired EIPS.

P-06-065

Influence of methylphenidate on sustained and selective attention in healthy adults

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Introduction: Methylphenidate (MPH) is one of the leading substances in pharmacological treatment of ADHD. It is used and approved in children and adolescents with ADHD, but also in adults. The increasing effect of MPH on attention is well examined in people with ADHD. In fact the influence of MPH on cognitive performance of healthy adults is poorly investigated yet. This paper deals with the effect of MPH on sustained and selective attention of healthy subjects.

Methods: Twenty-one healthy adults were assessed with the continuous performance test (CPT) and the d2-test in three conditions: without medication and two different dosages MPH (>0.5 and >1.0 mg/kg bodyweight). The volonteers (age range 19–44 years, $M = 27 \pm 5{,}7$, $IQ > 85$) were examined by SKID, CAARS and WURS in order to exclude and a mental illness, especially ADHD. One group carried out the tests firstly with and the other group without MPH.

Results and Discussion: There was no effect of MPH on sustained attention, but we found an increasing influence on selective attention in the MPH-conditions. Different explanations will be discussed.