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demonstrated high levels of schizophrenia spectrum pathology in Klinefelter (van Rijn et al., 2006a). Difficulties in social adaptation and abnormal brain asymmetries suggest that a genetic mechanism (involving genes on the X chromosome) might affect the development of social cognition in XXY men. Language and emotion are important aspects of social cognition. Reduced or abnormal lateralization of language has been found in Klinefelter’s syndrome (Geschwind, 1998; van Rijn et al., 2008). Additionally, impairments in emotional prosody perception have been reported (van Rijn et al., 2007). We expected that lateralization of emotional prosody differed in Klinefelter’s syndrome. Therefore, we used fMRI-guided transcranial magnetic stimulation (TMS) to study lateralization effects.

Methods: Seven men with Klinefelter’s syndrome and seven controls (matched on age, gender and education) performed an emotional prosody task during fMRI-scanning. In this task, subjects attended to the affective (happy, sad, angry or anxious) intonation and had to ignore the neutral semantic content of the sentences. We used fMRI-guided TMS (with BrainVoyager neuronavigation) to reduce excitability of areas that were active during emotional prosody processing in the MR scanner (left and right superior temporal gyrus). TMS was performed for 20 minutes on 1 Hz. After stimulation, the subjects performed the emotional prosody task again. In addition, a baseline measurement without TMS was included. Results were analyzed with repeated measures analysis of variance (ANOVA).

Results: Klinefelter patients showed a trend to react slower than controls (p = 0.12). They also showed longer reaction times on the angry condition after stimulation of the right superior gyrus (p = 0.05), whereas controls reacted faster. No other effects of TMS reached significance.

Discussion: Men with Klinefelter’s syndrome responded more slowly to sentences with an angry intonation in the emotional prosody task after right STG stimulation, whereas controls responded faster. The emotion angry is hypothesized to be primarily processed by the left hemisphere. Thus, the involvement of the right STG in anger prosody processing in Klinefelter patients suggests a switch in lateralization. The faster responses in the healthy group for this emotion might be due to callosal disinhibition of the left hemisphere by the right hemisphere TMS. As fMRI studies have suggested similar patterns of aberrant lateralization in Klinefelter syndrome and schizophrenia, our results may have implications for understanding schizophrenia.

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structure in functional brain networks in a preclinical model relevant to schizophrenia (Pratt et al., 2008).

**Methods:** Cerebral metabolism in 64 brain regions was determined in control rats (saline, male, Long-Evans, n = 7) and rats treated subchronically with PCP (2.58 mg.kg\(^{-1}\), i.p, 1x daily for 5 days, n = 9) by semi-quantitative 2-deoxyglucose (2-DG) autoradiography (Dawson et al., 2009). Overt alterations in metabolism between groups were analysed by t-test. For graph theoretical analysis binary adjacency matrices, over a range of correlation thresholds (Pearson's co-efficient 0.4 to 0.5), were generated from the brain region partial correlation matrix of each experimental group. Global network architecture was characterised in terms of the mean degree, average path length, mean clustering coefficient and small-worldness at each threshold. In addition, centrality analysis (degree, betweenness and closeness) was used to identify hub regions in these networks. Small-world properties and hub region identification were determined by statistically comparing real with calibrated random (Erdős-Rényi) graphs. Statistical differences in network architecture between groups was analysed using repeated measures ANOVA. Alterations in centrality measures between groups were analysed by comparing regional z-scores, generated relative to random networks, using t-test with Bonferroni correction. Significance was set at p < 0.05.

**Results:** Subchronic PCP-treatment induced overt hypometabolism in select prefrontal and thalamic regions in accordance with previous reports (Pratt et al., 2008). The functional brain network in PCP-treated animals had a significantly reduced mean degree, increased average path length and reduced mean clustering in comparison to that in controls. The network in PCP-treated animals also displayed a significantly higher small-worldness than that in controls. In control animals the mediodorsal and reticular (dorsal and ventral) thalami and locus coeruleus were identified as important hubs, across all centrality measures. Of these regions the reticular thalamus (ventral and dorsal) and locus coeruleus lost their hub status in PCP-treated animals. Several additional thalamic regions (anteromedial, centrolateral, centromedial and the nucleus reuniens) also showed reduced centrality in PCP-treated animals.


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**Poster 122**

**BRAIN ACTIVITY DURING SOCIAL COGNITION TASKS IN INDIVIDUALS WITH SCHIZOPHRENIA, THEIR UNAFFECTED SIBLINGS, AND HEALTHY CONTROLS**

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**Background:** Several studies have shown that patients with schizophrenia have impaired performance in various aspects of social cognition including emotion processing, theory of mind, and moral judgment. Most of the neuroimaging studies have compared patients and healthy controls during such mental activity because the understanding of the neural basis of social cognition might help to explain some deficits in social functioning in this group of patients. The present study examined brain activation patterns during social cognition tasks in patients with schizophrenia, and try to determine whether alterations in social cognition reflect a trait that can be detected in non-psychotic relatives of patients with schizophrenia.

**Methods:** Eight patients with schizophrenia (age 33.9±13.2 females, ten non-psychotic relatives (age 32.6±3.7 females) and ten matched comparison subjects (age 27.5±7.4 females) underwent BOLD (blood-oxygen-level-dependent) functional magnetic resonance imaging during visual presentation of different social cognition paradigms. Emotion processing was measured by the Ekman Faces Test using a task (basic emotions) and a control (gender) condition. Theory of Mind (ToM) paradigms were focused on the ability to discriminate complex mental states in Faces and Reading the Mind in the Eyes task, with a target (complex mental states) and a control (gender) condition as well. Moral judgment task consisted in 40 short passages, half of them with moral content, in which the subject has to judge the characters actions. Random effects analysis was done for each task within groups, measuring signal changes between the target and control conditions of each paradigm.

**Results:** The Reading the Mind in the Eyes (ToM task) brought about activation in the left inferior frontal gyrus, near Brodmann's areas 44 and 45, in all groups. Both patients and their siblings showed activation in the same area of the right hemisphere although with less intensity, and in the left striatum. Patient's siblings showed bilateral activation of the middle occipital gyrus. During a moral judgement task, right inferior frontal gyrus was activated in both patients and their relatives (but more intense in the former), and relatives activated right ventromedial prefrontal cortex as well. In this task, healthy persons activated preferentially bilateral postcentral gyr. Both facial tests evoked much lesser activation in patients than in the other two groups. Healthy subjects activated preferentially bilateral middle frontal gyr. Patients' siblings displayed the most intense activation of all groups including bilateral middle and inferior frontal gyr, parahippocampi, bilateral occipital structures and bilateral cerebellar structures.

**Discussion:** Reading the Mind in the Eyes and moral judgement tests evoked partially overlapping cerebral activation patterns in patients and their siblings but not in comparable healthy individuals. Emotion processing as assessed by social cognitive tasks involving faces evoked strong cerebral activation in unaffected siblings of schizophrenia patients. The present results suggest that social cognitive and moral tasks are associated with activation of brain areas partially similar in patients with schizophrenia and their unaffected siblings, and distinct from those in healthy individuals.

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**Poster 123**

**SIMILAR LANGUAGE ACTIVATION IN NON-PSYCHOTIC INDIVIDUALS WITH AUDITORY VERBAL HALLUCINATIONS AND CONTROL SUBJECTS**

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**Background:** Psychosis is a debilitating syndrome, characterised by hallucinations, delusions and disorganisation. A well-replicated find-