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MALADAPTIVE CONNECTIVITY OF BROCA'S AREA IN SCHIZOPHRENIA DURING AUDIOVISUAL SPEECH PERCEPTION: AN FMRI STUDY

G.R. Szycik¹, Z. Ye^{2,3}, B. Mohammadi^{3,4}, W. Dillo¹, B.T. te Wildt¹, A. Samii⁴, H. Frieling¹, S. Bleich¹, T.F. Münte^{3,4,5}

¹Hannover Medical School, Hannover, Germany, ²Capital Medical University, Beijing, China,

³Medical University of Lübeck, Lübeck, ⁴International Neuroscience Institute, Hannover,

⁵Center for Behavioral Brain Science, Magdeburg, Germany

Introduction: Natural speech perception relies on both, auditory and visual information. Both sensory channels provide redundant and complementary information, such that speech perception is enhanced in healthy subjects, when both information channels are present.

Objectives: Patients with schizophrenia have been reported to have problems regarding this audiovisual integration process, but little is known about which neural processes are altered.

Aims: In this study we investigated functional connectivity of Broca's area in patients with schizophrenia.

Methods: Functional magnetic resonance imaging (fMRI) was performed in 15 schizophrenia patients and 15 healthy controls to study functional connectivity of Broca's area during perception of videos of bisyllabic German nouns, in which audio and video either matched (congruent condition) or did not match (incongruent; e.g. video=hotel, audio=island).

Results: There were differences in connectivity between experimental groups and between conditions. Broca's area of the patient group showed connections to more brain areas than the control group. This difference was more prominent in the incongruent condition, for which only one connection between Broca's area and the supplementary motor area was found in control participants, whereas patients showed connections to 8 widely distributed brain areas.

Conclusions: The findings imply that audiovisual integration problems in schizophrenia result from maladaptive connectivity of Broca's area in particular when confronted with incongruent stimuli and are discussed in light of recent audio visual speech models.