

Making sense of the senseless: Abnormal brain connectivity in patients with schizophrenia during sentence processing

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Patients with schizophrenia show impairments in combining semantic and syntactic information to build and use context during sentence comprehension; rather, processing can be inappropriately driven by simple lexico-semantic relationships between individual words (Kuperberg, 2010). We also know from previous studies that frontal-temporal connectivity is altered in schizophrenia during simple lexico-semantic tasks (Friston and Frith, 1995; Li et al., 2010). In this study, we ask whether abnormal neural communication across components of the language network in schizophrenia is associated with an imbalance between semantic-syntactic unification and lexico-semantic processing. During fMRI scanning, 18 patients with schizophrenia and 20 demographically-matched controls read either sentences or random lists of words. A seed for the functional connectivity analysis was defined in left posterior temporal gyrus. We computed generalized psychophysiological interactions (gPPI, McLaren et al., 2012) from this seed for the sentences as well as the word lists. In reading sentences (versus baseline), patients with schizophrenia, relative to controls, showed significantly reduced connectivity from the seed to areas in the left inferior frontal gyrus. In reading word lists (directly contrasted with sentences), however, patients, relative to controls, actually showed enhanced connectivity with right temporal regions. These findings suggest that abnormal functional connectivity across the language network may underlie the impairments in building overall coherence in schizophrenia.