

Impaired theory of mind in first-episode schizophrenia: comparison with community, university and depressed controls

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Abstract

First order theory of mind, as measured by the 'Reading the Mind in the Eyes Test' Revised, is impaired in schizophrenia. However, no study has investigated whether this occurs in first-episode schizophrenia. Also, it is unclear whether such a deficit is specific to schizophrenia, and whether convenience control samples, particularly undergraduate university students, represent valid comparison groups.

This study investigated theory of mind ability, measured by the 'Reading the Mind in the Eyes Test' Revised, in a group of first-episode schizophrenia outpatients ($n=13$) and three control groups: outpatients with non-psychotic major depression ($n=14$), individuals from the general community ($n=16$) and from an undergraduate university course ($n=27$). The schizophrenia group exhibited significant theory of mind impairments compared to both non-psychiatric control groups but not the depression group. Unexpectedly, the depression group was not significantly impaired compared to the community control group, and the university control group exhibited superior theory of mind ability relative to all three groups. The findings indicate theory of mind deficits in first episode schizophrenia and support the implementation of theory of mind interventions in first-episode schizophrenia treatment programs. Results also indicate that community rather than university control groups represent more valid comparison groups in first-episode schizophrenia research.

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Theory of mind describes the ability to mentally represent one's own and others' mental states (Brune and Brune-Cohrs, 2006) and is integral in comprehending, explaining and predicting others' behaviour (Baron-

Cohen, 1995; Bora et al., 2006). Traditionally, theory of mind has been assessed using first and second order false belief metaphor and irony tasks (e.g., Stone et al., 1998; Wimmer and Perner, 1983), though these may be inappropriate in adult samples due to "ceiling" effects (Corcoran and Frith, 2003) and verbal memory demands (Brune and Brune-Cohrs, 2006). To avoid these pitfalls, novel research has examined first order theory of mind ('mentalisation') using the 'Reading the Mind in the

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Eyes Test' Revised (Eyes Test Revised; (Baron-Cohen et al., 2001).

Numerous studies have observed theory of mind deficits on traditional false belief, metaphor and irony tasks in patients with schizophrenia (for a review, see Brune, 2005). Seven recent studies also indicate mentalisation deficits, as measured by the Eyes Test Revised, in patients with schizophrenia (Craig et al., 2004; Irani et al., 2006; Kelemen et al., 2005; Kelemen et al., 2003; Kelemen et al., 2004; Murphy, 2006; Uhlhaas et al., 2006), which may influence positive symptoms (Garety et al., 2001) as well as social and emotional functioning (Bora et al., 2006; Brune et al., 2007; Keltner and Kring, 1998).

However, several issues remain unanswered. No study has investigated whether theory of mind impairments on the Eyes Revised Test are present during the first episode of schizophrenia. This is important as earlier stages of psychosis may be associated with distinct biological, psychological and social processes, indicating the need for stage-appropriate intervention (McGorry, 2007; McGorry et al., 2006). Whether deficits or biases in mental state attributions are present during the first episode of schizophrenia (rather than solely in later, more severe stages) is an empirical question that can inform specific theory of mind interventions (e.g., Combs et al., 2007; Kayser et al., 2006), potentially ameliorating positive symptoms (Garety et al., 2001) and improving social functioning (Bora et al., 2006). Empirically identifying any need for theory of mind interventions in first-episode schizophrenia is particularly pertinent given that early intervention in psychosis is now a recognized, recommended and efficacious treatment approach (McGorry et al., 2005).

There are also unresolved issues concerning appropriate control groups in first-episode research. Deficits on the Eyes Test Revised have been observed in other psychiatric disorders, such as major depression (Lee et al., 2005) and bipolar disorder (Bora et al., 2005). Evidence suggests that schizophrenia patients have performed similarly to patients diagnosed with Asperger's syndrome (Craig et al., 2004) but worse than patients with a mix of personality, substance abuse and mood disorders (Murphy, 2006; Uhlhaas et al., 2006). Further research is needed to delineate the relative specificity of theory of mind deficits to first-episode schizophrenia.

Secondly, psychiatric research often utilises convenience control samples who may not be representative of the general population, such as undergraduate university students (Watson, 2006). Samples of young adults with first-episode psychosis could be matched to

university control groups on years of education but not on the proportion of participants ever having attended tertiary education. Extant studies have either tested as controls university and hospital employees and their friends and relatives (Kelemen et al., 2005; Kelemen et al., 2004), individuals sampled through a schizophrenia research centre at a university (Irani et al., 2006), or not stated their source (Craig et al., 2004). Further research needs to clarify the validity of control groups sampled from universities or the general community. This will highlight whether theory of mind differences are due to impaired performance in a psychosis group or to superior performance in a control group.

This study examines theory of mind abilities, measured by the Eyes Test Revised, in a group of young adults with first-episode schizophrenia, a psychiatric control group of young adults with non-psychotic major depression and two non-clinical, community and university control groups. It is hypothesised that the schizophrenia group will perform significantly worse than the community and university control but not depression group on overall theory of mind ability, given past research indicating theory of mind deficits in psychosis (Craig et al., 2004) and depression (Lee et al., 2005). In this vein, it is hypothesised that the depression group will perform significantly worse than the two non-psychiatric control groups on overall theory of mind ability. Consistent with Baron-Cohen et al. (2001), who observed equivalent theory of mind abilities in a general community and undergraduate university sample, it is hypothesised that there will be no significant difference between the community and university control groups on overall theory of mind ability. Exploratory analyses will also be run to investigate differences between groups on theory of mind ability for negative, neutral and positive emotion items (see Harkness et al., 2005), as it is also possible that first-episode schizophrenia patients may exhibit deficits in the recognition of mental states of a specific valence.

1. Method

1.1. Participants

Participants were young adults from an undergraduate university course ($n=27$), the general community ($n=16$), and outpatients diagnosed with major depression ($n=14$) or first-episode schizophrenia ($n=13$). Undergraduate, university controls were recruited via an intra-departmental advertisement.

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