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Social cognition, empathy and functional outcome in schizophrenia

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ABSTRACT

Social and occupational functioning difficulties are a characteristic feature of schizophrenia, and a growing body of evidence suggests that deficits in social cognition contribute significantly to these functional impairments. The present study sought to investigate whether the association between social cognition and social functioning in schizophrenia would be mediated by self-reported levels of empathy. Thirty outpatients with a diagnosis of schizophrenia or schizoaffective disorder, and twenty-five healthy controls completed a well-validated facial affect processing task (Ekman 60-faces facial task from the Facial Expressions of Emotion — Stimuli and Tests; FEEST), The Awareness of Social Inference Test (TASIT; to assess emotion perception and complex social cognitive skills such as the detection of sarcasm and deceit, from realistic social exchanges), and measures of self-reported empathy and social functioning. Participants with schizophrenia performed more poorly than controls in identifying emotional states from both FEEST and TASIT stimuli, and were impaired in their ability to comprehend counterfactual information in social exchanges, including sarcasm and lies, on the TASIT. Impairment in the comprehension of sarcasm was associated with higher empathic personal distress, and lower recreational functioning. Impairment in the identification of the emotions of others was found to be associated with lower satisfaction and lower empathic fantasy. However, empathy could not be explored as a mediator of associations between social cognition and functional outcome, due to lack of common associations with functional outcome measures. These findings have implications for the remediation of specific social cognitive deficits with respect to improving functional outcomes in schizophrenia.

1. Introduction

Disturbances in social cognition are frequently observed in schizophrenia and contribute to poor functional outcomes, including the inability to engage in meaningful work and maintain satisfying interpersonal relationships (Couture et al., 2006). Whilst there has been recent interest in the functional impact, and targeted remediation, of basic social cognitive impairments (such as facial emotion perception) in schizophrenia (Horan et al., 2008), the functional consequences of deficits in more complex social cognitive skills, including Theory of Mind (ToM) (Premack and Woodruff, 1978) and empathetic mentalising capacities, have been less well studied. The present study therefore set out to examine the functional impact of both facial emotion and ToM impairments in schizophrenia, and their association with the capacity to empathise as a potential mediator of the relationship between social cognition and social functioning.

Interest in the functional impact of social cognitive deficits follows a considerable body of research demonstrating

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impairments in the perception of facial affect (Edwards et al., 2002; Namiki et al., 2007) and emotional prosody (Hoekert et al., 2007; Leitman, 2005) in schizophrenia. In recent years a number of studies have shown social cognition to be a better predictor of social functioning than non-social cognition (Brune, 2005; Sergi et al., 2006). Emotion perception in particular has been linked to social competence, independent living, community involvement and interpersonal relationships (Mueser et al., 1996; Poole et al., 2000). However, examination of the functional significance of ToM deficits is less common in schizophrenia. Moreover, the impact of social perception deficits on the ability to empathise, being the ability to understand and experience the emotion of another (Hoffman, 2000) (or mentalise about others' emotional states) has not been addressed. Empathy relies on the ability to accurately perceive another's emotions, beliefs and motivations in a given situation (Decety and Meyer, 2008; Rochat and Striano, 1999), and has been demonstrated to be impaired in schizophrenia (Montag et al., 2007; Shamay-Tsoory et al., 2007). ToM deficits have also been repeatedly demonstrated in individuals with schizophrenia (Harrington et al., 2005b; Janssen et al., 2003), most commonly using false belief (deception) tasks (Frith and Corcoran, 1996; Mazza et al., 2001).

In order to examine relationships between simple and complex social perception, empathy, and functional outcome in schizophrenia, we employed The Awareness of Social Inference Test (TASIT) (McDonald et al., 2003) as an ecologically valid measure of simple (basic emotion perception) and complex (ToM skills) social cognition. TASIT utilises verbal social communication (particularly sarcasm) to indicate ToM capabilities (Channon et al., 2005; Leitman et al., 2006; McDonald, 1999), and requires the integration of cues from face, prosody, gesture, and social context to identify the emotions, beliefs and intentions of target characters in videotaped conversational interactions that closely align with real-world social encounters. Sarcasm is one example of a non-literal language device used in conversation that relies on ToM to imply that the true state of affairs is the opposite to that asserted (Brown and Levinson, 1978; Haverkate, 1990), and recent studies using the TASIT demonstrate impairments of sarcasm perception in schizophrenia (Kern et al., 2009; Leitman et al., 2006).

In this study we set out to examine the functional impact of deficits in simple and complex social cognition, with respect to vocational, interpersonal, and recreational functioning, and the ability to empathise. We specifically aimed to test the hypothesis that associations between social cognition and functional outcome would be mediated by the capacity to empathise. We therefore hypothesised (1) that schizophrenia patients would be impaired on both TASIT emotion and sarcasm perception relative to healthy controls, and (2) that deficits in emotion and sarcasm perception in schizophrenia patients would be associated with impairments in empathy and interpersonal aspects of social functioning (separately), and that empathy skills would mediate associations between social cognition and social functioning.

2. Methods

All study procedures were approved by the Human research Ethics Committees of the University of New South Wales (HREC07104) and the South Eastern Sydney-Illawarra Area Health Service (07-171). All participants gave written informed consent prior to participation.

2.1. Participants

Twenty-five healthy controls (10 males) with a mean age of 35.7 years (SD = 12.9) were recruited from the general community. Thirty clinical participants (17 males) with a mean age of 46.1 years (SD = 8.4) were recruited from an outpatient clinic in the South Eastern Sydney and Illawarra Area Health Service, and the Australian Schizophrenia Research Bank Register (ASRB Register). Twenty-seven participants met DSM-IV (A.P.A., 1994) criteria for schizophrenia, and 3 met criteria for schizoaffective disorder. Two schizophrenia participants completed less than 70% of the test battery due to fatigue, and were therefore excluded from analyses. The twenty-eight remaining clinical outpatient participants (16 males) had a mean age of 45.9 years (SD = 8.7). All were taking antipsychotic medication at the time of testing: 4 participants were using conventional antipsychotics (clopixol) and 23 were taking second-generation atypicals (clozapine, olanzapine, and risperidone). Inclusion criteria were age 18–65 years, and ability to speak fluent English, with more than 10 years of formal education.

Exclusion criteria were history of head trauma, a neurological illness or central nervous system infection causing brain injury, or current alcohol or substance abuse or dependence.

2.2. Materials

2.2.1. Clinical assessment

A diagnosis of schizophrenia was confirmed by the treating clinician or via clinical assessment with the Diagnostic Interview for Psychosis (DIP) (Castle et al., 2006) on entry to the ASRB Register, and again confirmed at the time of interview using the Mini International Neuropsychiatric Interview (MINI) (Sheehan et al., 1998), based on DSM-IV diagnostic criteria (A.P.A., 1994). The MINI was also administered to healthy controls to eliminate current and past psychotic episodes, depression and anxiety. Current symptoms of schizophrenia patients were assessed using the Scale for the Assessment of Positive Symptoms (SAPS) (Andreasen, 1984) and the Scale for the Assessment of Negative Symptoms (SANS) (Andreasen, 1983). The National Adult Reading Test (NART) (Nelson and Willison, 1991) was administered to assess premorbid intelligence.

2.2.2. Social cognition measures

All subjects completed TASIT (McDonald et al., 2003) measure of emotion perception and ToM. Participants were tested on all three parts of Form A.

1. Part 1: *The Emotion Evaluation Test* is comprised of 24 short video clips in which an actor portrays one of six basic emotions (happy, sad, fear, disgust, surprise and anger).
2. Part 2: *Social Inference — Minimal* is comprised of fifteen video clips depicting sincere and sarcastic (simple sarcasm and paradoxical sarcasm) interactions between two actors, thus examining theory of mind. The dialogue is ambiguous,