



“Don't give me that look” – Overconfidence in false mental state perception in schizophrenia

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ARTICLE INFO

Article history:

Received 6 October 2011

Received in revised form 27 February 2012

Accepted 2 March 2012

Keywords:

Metacognition

Confidence

Social cognition

Reading the Mind in the Eyes

Cognitive insight

Neurocognition

Schizoaffective disorder

ABSTRACT

Dysfunctions in social cognition are implicated in the pathogenesis of schizophrenia and have been extensively replicated over the years. For memory research, the administration of cognitive tasks with metacognitive aspects like confidence ratings has deepened our insight into how impairments contribute to symptoms of the disorder. A total of 76 patients with schizophrenia or schizoaffective disorder and a sample of 30 healthy participants were tested with the *Reading the Mind in the Eyes* test (Eyes-test). The Eyes-test was complemented with a rating scale requesting response confidence and was administered along with paradigms tapping neuropsychological parameters and cognitive insight. Schizophrenia patients showed impaired abilities on mental state perception. In addition, they committed more high-confidence errors and at the same time made fewer high-confidence correct responses. Impairments were most pronounced in patients with formal thought disorder. The patients displayed a decreased metacognitive awareness for their deficits. The results suggest that adding confidence ratings to the investigation of social cognition promises to advance our understanding of social cognition in schizophrenia. Patients not only show severe impairments in social cognition, but are overconfident in their judgments and lack cognitive insight into their deficits. The results highlight the need for metacognitive therapeutic approaches for the treatment of this population.

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1. Introduction

Social functioning disabilities are a core feature of schizophrenia, is reflected, for example, in the specification of “social/occupational dysfunction” as one of the criteria for a diagnosis of schizophrenia in the DSM-IV-TR (American Psychiatric Association). Therefore, social cognition has been in the focus of a large body of research over the last two decades (e.g., Brüne, 2005; Penn et al., 2007; Fett et al., 2011). A broad range of subcategories has been put forward, for example, mentalizing, metacognition, empathy, emotion perception, emotion recognition and theory of mind (Couture et al., 2006), sometimes used synonymously and often largely overlapping in their intended meaning (Lysaker et al., 2010). The term “theory of mind” (ToM) is used most often in this context and was originally coined by Premack and Woodruff (1978) in the field of primatology and then transposed by Baron-Cohen et al. (1985) to developmental research on autism. It has been defined as “... the cognitive capacity to represent one's own and other persons' mental states, for instance,

in terms of thinking, believing, or pretending” (Brüne, 2005, p. 21) or as “... the ability to understand that others have mental states different from one's own and the capability to make correct inferences about the content of those mental states.” (Couture et al., 2006, p. 45). The construct of ToM, often operationalized by false belief tasks, represents the cognitive part of social cognition (i.e., perspective-taking of someone else; Harrington et al., 2005), which has been subdivided into two components. Understanding the perspective of someone else has been defined as ToM of the first order, whereas the ability to infer what someone is thinking about a third person is ToM of the second order (Brüne, 2005, p. 24). Emotion perception (EP) or, more precisely, affect recognition has been isolated from ToM and represents the emotional part of social cognition (Fett et al., 2011). This aspect is involved when deducing someone's feelings from facial expression (Kohler et al., 2010), from contextual information or from decoding prosody (Kee et al., 2009). Apart from ToM and EP, the understanding and application of social knowledge and etiquette, as well as understanding metaphors, irony, sarcasm or faux-pas situations and “reading between the lines”, represent aspects of social perception (SP; Couture et al., 2006, p. 45). These three facets of social cognition (i.e., ToM, EP and SP) engage and interact closely in everyday experiences and therefore are strongly intertwined.

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Patients with psychotic symptoms have been shown to share deficits in numerous aspects of social cognition, and there is growing evidence that these deficits represent trait rather than state characteristics (Sprong et al., 2007), although acute symptoms seem to have an aggravating effect (Bora et al., 2009b). Impairments have been found in first-episode psychosis (e.g., Koelkebeck et al., 2010), more pronounced especially during the acute phase (e.g., Bora et al., 2009a), but are also present in remission (e.g., Lysaker et al., 2011) and have been detected in delusion-prone individuals (Thompson et al., 2011), in individuals at risk for schizophrenia (Wölwer et al., 2011) and in first-degree relatives of patients with schizophrenia (e.g., Irani et al., 2006).

Various studies have employed the Reading the Mind in the Eyes test (abbreviated as Eyes-test in the following; Baron-Cohen et al., 1997, 2001) for the assessment of social cognition in psychosis (e.g., Craig et al., 2004; Bora et al., 2006, 2008; Inoue et al., 2006; Wang et al., 2008; Lysaker et al., 2011). This multiple-choice task requires the subject to infer an emotional state from the eye region of black-and-white photographs. The Eyes-test is not a pure emotion recognition task given that it demands further ToM-abilities (Baron-Cohen et al., 2001), as the test not only requires the participant to identify basic emotions but also more complex mental states (e.g., “sarcastic” or “jealous”; see Fig. 1). Bora et al. (2006) examined the ratio of Eyes-test deficits and social functioning, showing that more severe impairments were the best predictor for compromised real-world social abilities. In a study of Bora et al. (2008), the relationship between Eyes-test performance and the subjective insight of the tested subjects about their performance level was investigated; it was shown that Eyes-test deficits are proportional to a decreased level of empathy and that patients with schizophrenia are poor judges of their own performance. Craig et al. (2004) found an overall decreased performance in patients with schizophrenia on the Eyes-test similar to patients with Asperger’s syndrome. Focusing on schizophrenia patients in remission, Inoue et al. (2006) and Lysaker et al. (2010) revealed that this population also shows significant impairments on Eyes-test performance. Whereas Inoue et al. were not able to detect any correlations with specific symptomatic features, Lysaker et al. found a connection to disorganization. Wang et al. (2008) contrasted the Eyes-test outcome in depressed patients with and without psychotic symptoms to that in healthy controls and found not only that both patient groups showed impairments, but also that there was an even more pronounced deficit in the depressed patients with psychotic symptoms compared with the non-psychotic patient group.

Apart from studies on cognitive insight and self-reflexivity (e.g., Bora et al., 2007; Lepage et al., 2008; Buchy et al., 2009; Orfei et al., 2010), subjective and qualitative aspects are gaining more importance in both cognitive and neuropsychological research. This approach is often described as a metacognitive perspective (Koren et

al., 2006). The additional focus on confidence, vividness or deficit-awareness has contributed to a better understanding of how cognitive deficits are involved in functional and social impairments (e.g., Huron and Danion, 2002; Moritz et al., 2005, 2006a), especially in research on memory. Several studies by our group were able to detect overconfidence in memory errors in schizophrenia patients (e.g., Moritz and Woodward, 2006; Moritz et al., 2006b, 2008; Gaweda et al., 2012), which had been linked with a reduced threshold for the acceptance of hypotheses (Miller, 1976; Moritz et al., 2008). Based on these views, we hypothesized that overconfidence in errors is also present in the social domain in schizophrenia. In our opinion, the joint investigation of accuracy and confidence is important to the understanding of specific symptoms in schizophrenia, not as errors per se, but particularly high-confidence errors (i.e., when the subject is convinced about the accuracy of his/her interpretation), may promote delusional ideation. By contrast, errors made with low confidence unlikely elicit behavioral or social consequences (Moritz and Woodward, 2006).

The present study focused on mental state perception and pursued the following four aims: (1) We attempted to replicate earlier findings suggesting impairment in social cognition in patients with schizophrenia using the Eyes-test. (2) We complemented mental state judgments with ratings assessing patients’ level of confidence in their responses; (3) We assessed insight into one’s social cognition abilities, because lack of awareness about one’s impairments likely fuels social problems. (4) We examined the impact of psychopathological symptoms, basic neuropsychological performance and cognitive insight on Eyes-test deficits.

2. Methods

2.1. Participants

A total of 76 patients with schizophrenia were recruited from the psychosis inpatient and outpatient units of the University Medical Centre Hamburg-Eppendorf (Germany). Patients met the criteria for schizophrenia or schizoaffective disorder. Psychiatric diagnoses were verified with the Mini International Neuropsychiatric Interview (MINI; Sheehan et al., 1998), administered by a trained and experienced clinician. Bipolar disorder and substance dependence led to study exclusion. Similarly, none of the patients had a severe neurological illness (e.g., stroke or dementia), which would have also resulted in exclusion.

The healthy control group consisted of 30 participants and was recruited via the social network of the employees of the neuropsychological research unit of the University Medical Centre and via word-of-mouth. Presence of any Axis I disorder, as determined by the MINI interview, led to exclusion. Participants in both groups were between 18 and 65 years old, had an intelligence quotient (IQ) above 70 as assessed with the Multiple Choice Vocabulary Test (MWTB; Lehrl, 1995), and had sufficient command of the German language. Demographic and neuropsychological characteristics are displayed in Table 1; illness-related characteristics of the patient group are displayed in Table 2.

2.2. Psychopathology

The Positive and Negative Syndrome Scale (PANSS; Kay et al., 1989) was carried out by trained raters using the original semi-structured interview. It was complemented by six items of the Positive and Negative and Disorganized Syndrome Scale (PANADSS; Andresen and Moritz, 2000) to distinguish between associative loosening versus speech blockade/mutism, affective flattening versus inadequate affect and acoustic hallucinations versus hallucinations of other senses. A recent factor analytic study confirms that the PANSS is best captured by a five-factor model (van der Gaag et al., 2006): positive, negative and disorganized symptoms, excitement and emotional distress. For subsidiary analyses, the patient group was dichotomized into those with high and low levels (cut-off PANSS score: ≥ 3 ; according to Moritz et al., 2008) of persecutory delusions (item P6), presence of depressive feelings (item G6), presence of negative symptoms (PANADSS item Z3 for affective flattening), and presence of positive formal thought disorder (PANADSS item Z1 for associative loosening).

2.3. Reading the Mind in the Eyes-test

All patients underwent the Reading the Mind in the Eyes Test, which was first published in 1997 (Baron-Cohen et al.) and revised in 2001 (Baron-Cohen et al.). The participant is presented a black and white picture of a person, only showing the region of the eyes, and is asked to identify the likely mental state that the depicted person is portraying. For each of the 36 photographs, four possible emotional adjectives were given,

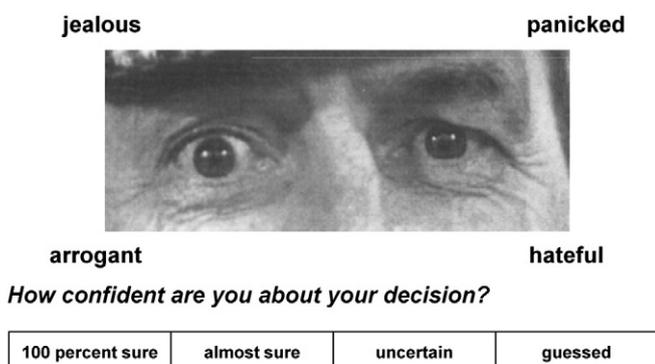


Fig. 1. The Eyes-test (correct response is panicked), accompanied by a confidence rating.

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