

Emotion recognition, ‘theory of mind,’ and social behavior in schizophrenia

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Received 17 August 2004; accepted 25 October 2004

Abstract

Several studies have demonstrated that patients with schizophrenia are impaired in recognizing emotions from facial expressions and in appreciating other people’s mental states—the latter commonly referred to as ‘theory of mind.’ The question as to how social cognitive skills relate to patients’ actual social behavior is, however, largely unanswered. This study examined emotion recognition, ‘theory of mind,’ and social behavior in schizophrenia. Emotion recognition, ‘theory of mind,’ executive functioning, ‘crystallized’ verbal intelligence, psychopathology, and social behavior were assessed in patients with schizophrenia compared with a healthy control group. Patients were significantly impaired on all tasks involving executive functioning, emotion recognition, and ‘theory of mind.’ Impaired executive functioning did, however, only partially account for the deficits in social perception and social cognition. Social perception and cognition in schizophrenia predicted the odds of being a patient significantly better than nonsocial cognition. Severe social behavioral abnormalities were linked to the duration of the illness, and even more so to ‘theory of mind’ deficits. Considering impaired social perception and social cognition significantly contributes to the understanding of social behavioral problems in schizophrenia.

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Keywords: Social cognition; Executive functioning; Social behavior; Schizophrenia

1. Introduction

The term ‘schizophrenia’ refers to a group of psychotic disorders that are characterized by cognitive symptoms such as thought disorder and delusions, and by behavioral symptoms such as catatonia or negative symptoms (American Psychiatric Association, 1994).

From a clinical perspective, the most outstanding characteristic of schizophrenia is the inapt, often bizarre behavior of affected individuals. In other words, it is almost always the deviant *social* behavior in schizophrenia that renders patients ‘abnormal.’ The importance of social behavioral problems in schizophrenia cannot be overestimated, since impaired social functioning in schizophrenic patients frequently precedes the onset of psychosis. Social deficits are often already present in first-episode patients, and may be relatively impervious to

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antipsychotic treatment. Moreover, social impairments in schizophrenia frequently worsen over the course of the disorder and probably contribute to the rate of relapse (recently summarized by Pinkham et al., 2003).

Over the past decades, however, most neuropsychiatric studies in schizophrenia have largely focused on disorders of ‘nonsocial’ cognitive processes such as executive functioning, attention, or memory (e.g., Evans et al., 1997; Cirillo and Seidman, 2003), deficits that certainly affect patients’ psychosocial skills. Only quite recently have researchers shifted their attention towards social cognition in schizophrenia (Penn et al., 1997; Pinkham et al., 2003), questioning to what extent an impaired *perception* of social signals or impaired *social cognition* may directly account for the poor social functioning in schizophrenia. There is indeed some evidence that, statistically, social cognitive measures may better distinguish between patients and nonpatients than ‘nonsocial’ tests (Penn et al., 1997). The association of social perceptual and cognitive skills in schizophrenic patients with patients’ actual social behavior is, however, to a certain extent still unclear (overview in Brüne, *in press*). It seems to turn out that patients with chronic schizophrenia suffering from marked negative symptoms are more impaired in their ability to recognize emotions from facial expressions and in their social skills, relative to less chronic patients (Mueser et al., 1996; Penn et al., 1996).

With regard to social cognition, a compelling theoretical framework to explain certain cognitive aspects of the marked social deficits in schizophrenia was put forward by Frith (1992). He hypothesized that many symptoms typical of schizophrenia may be accounted for by a specific cognitive incapacity of schizophrenic patients to accurately attribute mental states to themselves or others (commonly referred to as ‘having a theory of self and others’ minds’; ToM), leading to what Frith called ‘disorders of willed action,’ ‘disorders of self-monitoring,’ and ‘disorders of monitoring other persons’ thoughts and intentions’ (Frith, 1992). For example, if patients with schizophrenia have difficulties in perceiving their behavior as the result of their own enacted goals or to suppress inappropriate responses, their behavior may become dis-

organized. Secondly, if patients are unable to appreciate their behavior as the result of their own intentions, they may falsely interpret their actions as being under alien control or experience voice-commenting hallucinations. Thirdly, if patients confuse their subjective representations with reality, they may maintain false beliefs about other people’s intentions, for instance, in the form of delusional convictions of being poisoned or persecuted.

Frith and Frith (1999) have proposed that the perception of emotional states of other individuals is represented in a dedicated brain system different from (though overlapping with) a second one subserving ToM. The former involves a ‘ventral’ stream including the amygdala and the orbitofrontal cortex; the latter, a ‘dorsal’ pathway comprising the superior temporal sulcus, the inferior frontal regions, and the medial prefrontal cortex including parts of the anterior cingulate cortex (Frith and Frith, 1999, 2001).

With respect to schizophrenic disorders, there is a host of studies providing evidence that schizophrenic patients are profoundly compromised in recognizing other people’s emotions from facial expressions, gestures, or voices (reviewed in Mandal et al., 1998), and in inferring the mental states of others (i.e., ToM; overview in Brüne, *in press*). Many studies suggest that the deficits in these domains are specific rather than secondary to a general cognitive decline in schizophrenia (e.g., Bryson et al., 1997; Langdon et al., 1997).

Emotion recognition and ToM have, however, not been assessed simultaneously in adults with schizophrenia so far. Moreover, only a few studies have directly focused on the question as to whether patients’ compromised social perceptual skills account for their actual social behavioral problems, and only one study has looked at ToM and its relation to social behavior in schizophrenia (Roncone et al., 2002).

The present study attempts to clarify the following hypotheses: (1) compared with healthy controls, patients with schizophrenia are impaired in both emotion recognition and ToM tasks; (2) the performance on social cognitive tasks contributes a significant proportion of the amount of variance to distinguish between patients and controls, the amount of variance being possibly greater than that

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