



Different aspects of theory of mind in paranoid schizophrenia: Evidence from a video-based assessment

Christiane Montag^{a,*}, Isabel Dziobek^{b,c}, Inga S. Richter^a, Kathrin Neuhaus^a, Anja Lehmann^a, Rudolf Sylla^a, Hauke R. Heekeren^{b,c}, Andreas Heinz^a, Jürgen Gallinat^a

^a Charité University Medicine Berlin (Charité Universitätsmedizin Berlin), Department of Psychiatry and Psychotherapy, Campus Mitte, Charitéplatz 1, 10117 Berlin, Germany

^b Max Planck Institute for Human Development (Max-Planck-Institut für Bildungsforschung), Lentzeallee 94, 14195 Berlin, Germany

^c Cluster of Excellence "Languages of Emotion", Freie Universität, Habelschwerdter Allee 45, 14195 Berlin, Germany

ARTICLE INFO

Article history:

Received 9 January 2010

Received in revised form 13 September 2010

Accepted 17 September 2010

Keywords:

Schizophrenia

Social cognition

Theory of mind

Movie for the Assessment of Social Cognition (MASC)

Overmentalizing

ABSTRACT

In schizophrenia, impairments of theory of mind (ToM) may be due to excessive ('overmentalizing') or defective ('undermentalizing') attribution of mental states. However, most ToM tests differentiate neither between 'overmentalizing' and 'undermentalizing' nor between cognitive and affective ToM in schizophrenia. This study aimed at differentiating these aspects of ToM in 80 patients diagnosed with paranoid schizophrenia and 80 matched healthy controls using the 'Movie for the Assessment of Social Cognition' (MASC). Outcome parameters comprised 1) error counts representing 'undermentalizing' or 'overmentalizing', 2) decoding of cognitive or emotional mental states and 3) non-social inferencing. Multivariate analysis of covariance (MANCOVA) showed significantly abnormal scores for two dimensions of 'undermentalizing' as well as for cognitive and emotional ToM that were not explained by global cognitive deficits. Scores for 'overmentalizing' did not differ between groups, when age, gender, non-social reasoning and memory were controlled. In schizophrenic patients, negative symptoms were associated with a lack of a mental state concept, while positive symptoms like delusions were associated with 'overmentalizing', supporting respective etiological concepts of delusions.

© 2010 Elsevier Ireland Ltd. All rights reserved.

1. Introduction

Over the last few decades, a vast body of literature on social-cognitive abilities in schizophrenia has been accumulated (Penn et al., 2008). In the social-cognitive realm, theory of mind (ToM) or mentalizing was defined originally as the capacity to attribute causal mental states like thoughts, beliefs and intentions to con-specifics (Premack and Woodruff, 1978). ToM deficits are widely recognized in schizophrenia and are mainly considered to be trait markers of the disease (Brüne, 2005a) although some evidence indicates additional deterioration during acute episodes and in the long-term course of the disease (Drury et al., 1998; Langdon and Coltheart, 1999; Lee et al., 2006). Of note, impairments of social cognition affect functional outcome independently from general neurocognitive measures (Green et al., 2000; Pinkham et al., 2003; Brüne et al., 2007). Thus,

targeted interventions have been developed in order to mitigate social-cognitive deficits and their secondary impact as interactional stressors (Moritz and Woodward, 2007; Penn et al., 2007).

In his seminal work, Frith (1992) conceived schizophrenia as a disorder of the representation of mental states. Accordingly, difficulties in representing various types of one's own or others' mental states may result in disorders of 'willed action' (e.g., negative and disorganized symptoms), disorders of self-monitoring (e.g., 'passivity' phenomena), or disorders of monitoring other persons' thoughts and intentions (e.g., delusions of persecution and ideas of reference). The failure to correctly infer others' mental states in schizophrenia may be explained by more than one underlying mechanism: Schizophrenic patients – similar to autistic individuals – may not be able to conceptualize mental states at all and hence predict behavior on the basis of the actual state of the world rather than beliefs. Alternatively, patients might possess knowledge about other people's minds but apply it in an incorrect or biased way. This could result either in an overly simplistic or an overly complex attribution of mental states to others (Abu-Akel, 1999; Abu-Akel and Bailey, 2000; Blakemore et al., 2003). Frith (2004) suggested that patients with predominantly negative or disorganized ('behavioral') symptoms and developmental onset of the disease might lack a functional concept of mental states like beliefs or intentions ('undermentalizing'), while patients with paranoid symptoms would tend to 'overmentalize', e.g., to excessively

* Corresponding author. Charité Universitätsmedizin Berlin, Campus Mitte (PUK Charité im SHK), Charitéplatz 1, 10117 Berlin, Germany. Tel.: +49 30 2311 2969; fax: +49 30 2311 2903.

E-mail addresses: christiane.montag@charite.de (C. Montag), dziobek@mpib-berlin.mpg.de (I. Dziobek), inga@zeraphine.de (I.S. Richter), kathrin.neuhaus@charite.de (K. Neuhaus), anja.lehmann@charite.de (A. Lehmann), rudolf.sylla@charite.de (R. Sylla), heekeren@mpib-berlin.mpg.de (H.R. Heekeren), andreas.heinz@charite.de (A. Heinz), juergen.gallinat@charite.de (J. Gallinat).

attribute – mainly malevolent – intentions or self-referential meaning to others and therefore predict behavior on the basis of the wrong beliefs. Although of fascinating theoretical appeal, the hypothesis of ‘overmentalizing’ (Frith, 2004) or ‘hyper-theory of mind’ (Abu-Akel, 1999) in paranoid subjects has hardly been tested, and the causal influence of impaired ToM on the formation of paranoid experiences is still under debate (Freeman, 2007). In contrast to the multitude of studies that found associations of ToM deficits with negative symptoms or disorganization (Brüne, 2005a), studies linking paranoid symptoms with ToM deficits have shown both consistent (Corcoran et al., 1995, 1997, 2008; Craig et al., 2004; Marjoram et al., 2005; Harrington et al., 2005a) and conflicting results (Sarfati et al., 1997; Randall et al., 2003; Drury et al., 1998). This may be explained by an insensitivity of some ToM tests, which usually use dichotomous (‘right/wrong’) response formats. The few studies that have reported ‘overmentalizing’ in schizophrenia reported excessive ascription of contingencies, mental states or negative intentions but used experimental settings remote from real-life interaction (Blakemore et al., 2003; Russell et al., 2006; Langdon, 2007).

Shamay-Tsoory et al. (2007) have suggested that ToM skills refer to emotional as well as cognitive mental states. Affective ToM partly relates to the concept of empathy, which involves both inferring and sharing the emotional experiences of others. Studies trying to dissect cognitive and affective dimensions of ToM in schizophrenia are rare and draw conclusions mostly from heterogeneous tests (Bora et al., 2008; Abu-Akel and Abushua'leh, 2004; Shur et al., 2008) or focus on the role of basic emotion recognition and social perception for mental state attribution (Brüne, 2005b). However, a minority of studies has directly compared cognitive and affective ToM capabilities in combined experiments, but they have yielded conflicting results in schizophrenia (Langdon et al., 2006; Shamay-Tsoory et al., 2007).

Most ToM tests present abstract experimental environments and use stimuli of a single modality. Considering this fact, a video-based experimental setting that approximates the demands of everyday life might alleviate some of the problems of explicit, ‘offline’ mentalizing and also facilitate the use of more or less successful compensatory strategies (McCabe et al., 2004; Frith and Frith, 2008). Therefore, the present study investigates ToM deficits in schizophrenia with the Movie for the Assessment of Social Cognition (MASC; Dziobek et al., 2006a; Fleck et al., 2006). As another advantage, the MASC allows the separate quantification of the use of aberrant mentalizing strategies like ‘overmentalizing’ and ‘undermentalizing’, of the ability to attribute cognitive and affective mental states correctly, as well as of non-social reasoning.

The aim of this work was to clarify the nature of ToM deficits with respect to putative relations to psychopathology in paranoid schizophrenia. It was hypothesized that patients with paranoid schizophrenia would perform worse than controls on both cognitive and emotional mental state attribution, and that this alteration would not be due to deficits of general cognitive function. Furthermore, it was assumed that the extent of ‘over-’ or ‘undermentalizing’ would be associated with the expression of positive or negative symptoms, respectively.

2. Materials and methods

2.1. Participants

The study was approved by the local ethics committee (Charité Universitätsmedizin Berlin, Germany). All subjects gave written informed consent. Eighty in- and outpatients diagnosed with schizophrenia were recruited from the Department of Psychiatry, Charité Universitätsmedizin Berlin. Diagnosis was confirmed using the Structured Clinical Interview for DSM-IV (SCID-I; First et al., 1995; German version: Wittchen et al., 1997); symptom severity was assessed with the Positive and Negative Syndrome Scale (Kay et al., 1987). All patients fulfilled criteria for paranoid schizophrenia according to the Diagnostic and Statistical Manual of Mental Disorders IV, text revision (DSM-IV-TR; Saß et al., 2003). Healthy participants, matched according to age, gender and verbal intelligence, were recruited by newspaper advertisements and screened by a

psychiatrist with the Mini-International Neuropsychiatric Interview (M.I.N.I.; Sheehan et al., 1998). Exclusion criteria for both groups were DSM-IV axis-I or axis-II disorders (except schizophrenia for the patient group); controls reporting axis-I mental disorders in their first-degree relatives were also excluded.

Characteristics of the patient group are given in Table 1. Medication protocols were as follows: unmedicated: $n = 6$ (7.5%); atypical neuroleptic: $n = 64$ (80%); conventional neuroleptic: $n = 2$ (2.5%); combination atypical + conventional neuroleptic: $n = 8$ (10%); additional antidepressant: $n = 14$ (17.5%); additional benzodiazepine: $n = 7$ (8.8%); additional antiepileptic: $n = 8$ (11.2%); and additional anticholinergic: $n = 3$ (3.8%). Chlorpromazine (CPZ) equivalents were calculated according to Lambert et al. (2004) and Schulz et al. (1989); CPZ equivalents of intramuscular Risperidone were estimated on the basis of recommended doses.

2.2. Tasks

The Movie for Assessment of Social Cognition (MASC) was developed for the ecologically valid assessment of mindreading abilities in adults. It adopts the traditional social cognition concepts such as first- and second-order false belief, faux pas, metaphor, or sarcasm multimodally (visual and auditory input) and operationalizes these concepts through a short movie approximating real-life social interactions. The MASC was validated in a sample of patients diagnosed with Asperger syndrome (Dziobek et al., 2006a); Fleck (2007) evaluated the test and its subscales in patients with paranoid schizophrenia and Asperger syndrome. In both investigations, the MASC showed the highest discriminative power in detecting ToM deficits compared to standard social-cognitive tasks, like the Reading the Mind in the Eyes test (Baron-Cohen et al., 2001), the Strange Stories Task (Happé, 1994), and basic emotion recognition (Ekman and Friesen, 1971), a good interrater reliability and internal consistency. The MASC was also used in healthy individuals indicating a reliable detection of even subtle mindreading difficulties in individuals of normal IQ (Smeets et al., 2009). A recent study investigated healthy subjects carefully screened for mental health and euthymic bipolar patients (Montag et al., 2009). Bipolar patients showed significant impairments of cognitive, but not of affective ToM in comparison to normal controls (Montag et al., 2009). Moreover, MASC sum scores were found to be related to amygdala volumes in healthy adults (Dziobek et al., 2006b). We used a computerized multiple-choice version of the MASC that offers four options for each query (MASC-MC; Fleck et al., 2006). Correct answers are presented together with three distractors corresponding to three types of errors in mental state reasoning tasks (Fig. 1). Distractors were modeled on the basis of incorrect answers given by participants in different validation samples (Dziobek et al., 2006a; Fleck et al., 2006; Fleck, 2007; Adenauer et al., 2007). The movie plot comprises the interaction of four characters getting together for an evening of cooking, dining, and playing a board game. Participants are instructed to try to understand the characters’ mental states and to answer 48 multiple-choice questions at given breaks. Questions mostly refer to complex mental states and allow a detection of subtle mindreading difficulties (Dziobek et al., 2006a). Questions and multiple-choice answers are read aloud by the instructor and silently by the participant. The MASC provides a sum score for all mental state decoding questions, and the following additional subcategories:

Error categories: Categories are: 1) ‘undermentalizing’ with two forms, either 1a) overly simplistic mental state inferences despite an intact capacity to represent mental states (‘reduced ToM’), or 1b) the complete lack of a mental state concept (‘no ToM’), and 2) ‘overmentalizing’, i.e. overly complex mental state reasoning (‘exceeding ToM’).

Mental state modalities are reflected by the factors 1) cognitive ToM (e.g. attribution of thoughts, knowledge or action plans; ‘What is X thinking/intending?’; 23 items) and 2) emotional ToM (e.g. attribution of anger or guilt; ‘What is X feeling?’; 19 items).

Non-social inferring was assessed with six control questions requiring a high degree of mental flexibility and abstract reasoning devoid of demands on social-cognitive competencies (for example “How was the weather this evening?”; the correct answer has to be inferred from the clothing of the arriving protagonists.). Correct answers are also presented together with three distractors.

2.2.1. General cognitive functioning

In addition to the MASC control condition, a multiple-choice vocabulary test (Mehrfachwahlwortschatztest, MWT-B; Lehrl, 1991) was applied to estimate ‘pre-morbid’ verbal intelligence. The Auditory Verbal Learning Test (AVLT; Heubrock, 1992)

Table 1

Characteristics of illness in schizophrenic patients ($n = 80$).

	Mean (S.D.)
Illness duration [y]	9.8 (± 8.6)
Number of episodes	5.6 (± 5.4)
Age of onset [y]	29.2 (± 10.0)
Current medication	
Antipsychotics (sum) [CPZ equiv.; mg]	446 (± 369)
Atypical antipsychotics [CPZ equiv.; mg]	379 (± 288)
Conventional antipsychotics [CPZ equiv.; mg]	529 (± 403)
PANSS positive score	15.9 (± 6.6)
PANSS negative score	17.8 (± 7.7)
PANSS global score	32.4 (± 12.5)

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات