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An investigation of attributional style, theory of mind and executive functioning in acute paranoia and remission

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ABSTRACT

This study assessed associations between attributional style and ToM measures in patients with paranoid symptoms and non-clinical controls, as well associations between these aspects of social cognition and executive skills. Using a longitudinal design, we further assessed performance on measures following the remission of paranoid symptoms. Patients and controls completed the Internal Personal and Situational Attributions Questionnaire (IPSAQ), ToM tasks, the Stroop, the modified Wisconsin Card Sorting Test (WCST) and a measure of premorbid IQ at time one. Following the remission of paranoid symptoms, the patient group repeated the assessment process. Patients had a higher personalising bias for negative events and impairments in second order false belief and executive skills compared to control participants. Personalising bias for negative events was associated with poorer IQ, a tendency to make perseverative errors, a poorer performance on the second order false belief task and more severe symptoms. Personalising bias for negative events, performance on the second order false belief task or the tendency to make perseverative errors did not significantly change following symptom remission. The findings increase understanding of the mechanisms that potentially underpin the development and maintenance of paranoia. Specifically targeting personalising attributions for negative events in remitted patients may be an important goal of psychological therapy.

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1. Introduction

Bentall and Kinderman argue that individuals with paranoia have a personalising attributional bias, whereby they excessively blame other people rather than circumstances or situational factors for negative events. The tendencies for paranoid patients to make less situational attributions for negative events and more other-blaming attributions are now relatively well-established (Kinderman and Bentall, 1997; Randall et al., 2003; Aakre et al., 2009; Lincoln et al., 2010). There is also substantial research showing Theory of Mind (ToM) deficits in schizophrenia; although the findings in relation to ToM and paranoia specifically are mixed (Sprong et al., 2007; Bora et al., 2009). One possible reason for this inconsistency is the different information processing requirements of tasks used to measure ToM (Moore et al., 2006; Shryane et al., 2008; Corcoran et al., 2011).

Integrating attributional and ToM theories of paranoia, Bentall et al. (2001) proposed that ToM skills provide contextual information important for making situational attributions. That is, attributing

events to more benign situational-external factors requires the capacity to adopt another individual's perspective and appreciate the inherent variability of factors at play in social situations. There is some evidence of associations between ToM and personalising other-blaming attributions in non-clinical studies (Kinderman et al., 1998; Taylor and Kinderman, 2002), in a remitted sample of patients with schizophrenia and schizoaffective disorders (Mehta et al., 2014a) and in one small clinical sample with paranoid delusions during an acute phase of psychosis (Randall et al., 2003), but research investigating associations between attributional style and different aspects of ToM is underdeveloped.

Difficulties in considering situational factors might also be explained by more general neurocognitive deficits often found in schizophrenia (Bentall et al., 2001). Although it is well recognised that social and neurocognition are distinct constructs, there is relatively consistent evidence of moderate associations between the two (Ventura et al., 2013; Mehta et al., 2014a, 2014b). Lincoln et al. (2010) found a small but significant association between overall number of situational attributions and verbal memory capacity, but no correlations between situational attributions and cognitive flexibility as assessed by the Trail Making Test. These findings suggest that verbal memory deficits might present an additional challenge when making situational attributions,

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although the deficits assessed by the Trail Making Test may not be specifically involved in thinking about situational factors. Stronger associations might be found with tests that measure the executive skills of representing and manipulating contextual information.

An important question in the social cognition literature is whether social cognitive deficits are state or trait-specific. There is an evidence from cross-sectional studies that remitted paranoid patients have better ToM abilities than acutely paranoid patients, although impairments in remitted patients are still evident in more cognitively demanding ToM tasks (Herold et al., 2002; Randall et al., 2003). There is also evidence that remitted patients score between paranoid and healthy controls on measures of external-personal attributions (Lincoln et al., 2010; Mehta et al., 2014a). However, there are relatively few studies that assess changes in social cognition in the same patients who move from an acute to a remitted episode of psychosis, using more powerful longitudinal designs (So et al., 2010; Ventura et al., 2013).

Two studies have specifically investigated changes in attributional style from acute phases to remission (Peters and Garety, 2006; Mizrahi et al., 2008). The study by Peters and Garety (2006) used an implicit measure of attributions and found that there was an increase in a self-serving attributional bias at follow-up, but the study did not include a measure of personalising bias (Peters and Garety, 2006). Mizrahi et al., (2008) used a more explicit measure of attributions which included a measure of personalising bias in a sample of first episode patients. Consistent with Peters and Garety (2006), the authors found that patients were less likely to blame themselves for negative events following the remission of symptoms, but personalising bias did not change significantly over time. The one prospective study of ToM which involved the same sample of first episode patients described in the authors' paper reported that ToM improves following remission; although changes in ToM were not correlated with changes in symptoms (Mizrahi et al., 2007). The longitudinal design of these studies is clearly a strength. However, in addition to the aforementioned limitations, studies by both research groups recruited mixed samples of patients with schizophrenia and related psychoses rather than those with symptoms of paranoia.

First this study compares attributional style, ToM abilities and executive skills in paranoid patients and non-clinical controls and examines associations between these constructs. Second, the study assesses the same paranoid patient group on the measures over time (acute vs. remitted). Specifically, we tested four hypotheses: 1) compared to healthy non-clinical participants, symptomatic paranoid patients will show a personalising attributional bias for negative events and impairments in ToM and executive skills; 2) a personalising attributional bias for negative events will be associated with poorer ToM and executive skills; 3) severity of symptoms will be positively correlated with personalising attributional bias for negative events and impairments in ToM and executive skills; and 4) following the remission of paranoia, there will be improvements in personalising bias for negative events, ToM and executive skills.

2. Method

2.1. Participants

Participants were 25 acute psychiatric in-patients and 25 healthy non-clinical controls who were purposively recruited to ensure that their demographic characteristics were similar to the patient participants. Patient inclusion criteria were: a diagnosis of schizophrenia (paranoid type), which was determined by the patient's Consultant Psychiatrist and recorded in the case notes during the patient's current admission; English speaking; and capacity to consent.

2.2. Measures

2.2.1. Social cognition measures

The 16-item version of the Internal Personal and Situational Attributions Questionnaire (IPSAQ; Kinderman and Bentall (1996)) was used to measure

attributional style. The 16 items are divided into 8 positive and 8 negative hypothetical social events (e.g. 'A friend invites you for a drink'). For each item, participants are asked to imagine the most likely cause of the event and categorise the cause as being something to do with themselves (internal), something to do with another person/persons (personal external), or something to do with circumstances or chance (situational external). We calculated three derivative scores: externalising bias; personalising bias for negative events; and personalising bias for positive events. Externalising bias was calculated by subtracting the number of internal attributions for negative events from the number of internal attributions for positive events. Personalising bias for negative events was calculated by dividing the number of personal attributions for negative events by the sum of both personal and situational attributions for negative events. Personalising bias for positive events was calculated by dividing the number of personal attributions for positive events by the sum of both personal and situational attributions for positive events.

ToM was assessed using three stories based on those described by Frith and Corcoran (1996). These ToM tasks assess the ability to understand false beliefs and the intention to deceive. We included one first and one second order false belief task and one second order deception task. In first order tasks, a character has a false belief about the state of the world. In the second order tasks, one character has a false belief about the beliefs of another character. Participants' responses were only coded as correct if they were able to justify their responses by demonstrating an understanding of false belief or deception (Sullivan et al., 1994). Associations between variables and each ToM task were examined separately due to the possibility that different tasks require different cognitive abilities (Bora et al., 2009).

2.2.2. Neurocognitive measures

The Stroop (Stroop, 1935) is a measure of selective attention and scores reflect participants' difficulty inhibiting pre-potent responses. Participants are asked to name the colour of ink that individual words are printed in and the speed of their performance on lists is timed. Scores for the test are derived by subtracting the time taken to name the ink in the congruent condition from the equivalent time in the incongruent condition.

The modified version of the Wisconsin Card Sorting Test (WCST; Nelson, 1976) is a widely used alternative to the original more demanding WCST task (Heaton et al., 1993) assessing planning, manipulating information and set changing ability. The test consists of 4 stimulus cards and 24 response cards which depict shapes varying in terms of numbers or colours. The stimulus cards are placed in front of participants and they are asked to organise the response cards into groups under the stimulus cards. If participants' first response can be categorised by shape, colour or number, they are told that they have guessed the correct rule and subsequent responses are coded accordingly. After six correct responses participants are informed that the rule has changed and that they need to find another rule for organising the cards. Whichever of the two remaining categories is chosen it is scored as correct for the next six successful responses. The rule then changes to the final category and the three rules are repeated in the same order again. The test is completed when six categories have been sorted or when all cards have been administered. Measures of performance include number of categories, total number of errors and number of perseverative errors. An error is scored as perseverative if it follows a category concept which the participant has been informed was incorrect. We used the number of perseverative error scores as a measure of executive skills.

The National Adult Reading Test (NART; Nelson and O'Connell, 1978) was used to provide an estimate of IQ. The use of reading ability to estimate IQ is a well-established procedure (Crawford et al., 1989).

2.2.3. Symptoms

Patients were assessed using the KGV (Krawiecka, Goldberg and Vaughan), which is a validated scale for rating psychiatric symptoms (Krawiecka et al., 1977). The interviewer is required to rate the severity of symptoms on a 0–4 scale and the higher the total score, the more severe the symptoms. The measure assesses 13 symptoms typically associated with schizophrenia, including positive, negative and affective symptoms. Ratings are based on both the information provided by the patient during an interview and on systematic observation of the patient's behaviour during the interview. A total symptom score can be derived from the measure which provides an indication of severity of illness. The measure was administered by the first author who was experienced in using the tool with psychiatric patients. Research has shown that the inter-rater reliability of the KGV is good for all items and that the measure is sensitive to clinical change over time. The KGV is also significantly correlated with other scales of psychotic and depressive symptoms, suggesting that it has good concurrent validity (Perez Fuster et al., 1989a, 1989b).

2.3. Procedure

Potential patient participants were approached on inpatient psychiatric wards in the Northwest of England, UK. Non-clinical participants were selected randomly from a list of hospital porters and domestic staff and were approached directly by KB following permission from line managers. The patient sample was assessed once

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