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Differential impairment of social cognition factors in bipolar disorder with and without psychotic features and schizophrenia

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ABSTRACT

While it is well-established that patients with schizophrenia and bipolar disorder exhibit deficits in social cognition, few studies have separately examined bipolar disorder with and without psychotic features. The current study addressed this gap by comparing patients with bipolar disorder with (BD+) and without (BD−) psychotic features, patients with schizophrenia (SZ), and healthy controls (NC) across social cognitive measures. Principal factor analysis on five social cognition tasks extracted a two-factor structure comprised of social/emotional processing and theory of mind. Factor scores were compared among the four groups. Results identified differential patterns of impairment between the BD+ and BD− group on the social/emotional processing factor while all clinical groups performed poorer than controls on the theory of mind factor. This provides evidence that a history of psychosis should be taken into account while evaluating social cognition in patients with bipolar disorder and also raises hypotheses about the relationship between social cognition and psychosis.

1. Introduction

Social cognition is a multifactorial construct defined as the ability to process social information for adaptive functioning (Ochsner and Lieberman, 2001). This construct has emerged as a topic of interest in psychiatry research. Studies with schizophrenia have consistently identified deficits on social cognition including emotional prosody, theory of mind, and facial affect recognition (Bora et al., 2009; Hoekert et al., 2007; Kohler et al., 2010). These deficits in turn predict important functional, clinical, and real-world outcomes including everyday functioning and interpersonal effectiveness (Green et al., 2008; Mancuso et al., 2011; Roncone et al., 2002; Sergi et al., 2006).

While social cognition research in schizophrenia has seen a dramatic surge over the last decade, there are fewer studies examining social cognition in bipolar disorder. This is an issue as there is evidence that this clinical population has consistent, albeit less severe, deficits (Derntl et al., 2012; Lee et al., 2013). Available studies comparing individuals with bipolar disorder to controls suggest that patients exhibit significant deficits in theory of mind (Bora et al., 2005; Kerr et al., 2003; Samamé et al., 2012). Research on facial affect recognition has been less conclusive, however, with some studies identifying impairments and others identifying no overall groups differences (Bora et al., 2005; Kohler et al., 2011; Martino et al., 2011). In addition, a recent meta-analysis reported a small effect size for facial affect recognition and a moderate one for theory of mind in euthymic patients with bipolar disorder (Samamé et al., 2012). However, this study did not control for psychosis which is known to impact social cognition (Fett and Maat, 2013).

There is limited literature examining the degree to which social cognition in patients with bipolar disorder with a history of psychotic features differs compared to those without any such history. Such studies are warranted as unique neurocognitive profiles between individuals with bipolar disorder with and without psychotic features have been identified (Allen et al., 2010; Bora et al., 2007; Glahn et al., 2007). As social cognition is a useful predictor of functional capacity and outcome in psychiatric populations (Green et al., 2008), reliably identified differences among diagnostic populations are crucial to pinpoint for treatment planning, medication management, and long-term patient care.

A recent publication by Thaler et al. (2013b) compared patients with schizophrenia to controls and patients with bipolar disorder with and without a history of psychotic features on a single facial affect recognition task. The results of this study yielded two findings. First, the bipolar group with a history of psychotic features demonstrated relative impairment on the task compared to the bipolar group without a history, which in turn did not differ

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from the control group. Second, the former group exhibited a trend towards misinterpreting neutral emotions as negative that resembled the schizophrenia group's performance, suggesting a shared similarity across diagnostic boundaries. This study was among the first to suggest that a history of psychotic features is an important variable to account for when investigating social cognitive performance in bipolar disorder. However, results were limited in broader interpretation as only a single social cognition task was used.

The current project set out to extend previous findings by examining several social cognition tasks that measure social perception, facial affect recognition, and theory of mind. These constructs were selected as they have consistently demonstrated predictive validity in psychiatric populations including bipolar disorder and schizophrenia. The measures underwent a factor analysis to identify psychometrically convergent social cognitive factors, which were then compared among patients with bipolar disorder with and without psychotic features, patients with schizophrenia, and controls. Based on prior findings, we anticipated that two factors would emerge that represent lower and higher levels of social cognitive processing (Mancuso et al., 2011; Ziv et al., 2011). We then hypothesized that the bipolar with psychotic features group would have more impairment on social cognitive factors than the bipolar without psychotic features group and controls, as has been found with facial affect recognition and non-social neurocognitive domains (Allen et al., 2010; Bora et al., 2007; Glahn et al., 2007; Thaler et al., 2013b). We also hypothesized that the schizophrenia group would performance the poorest on all tasks as reported in other studies (Derntl et al., 2012; Lee et al., 2013).

2. Materials and methods

2.1. Participants

Participants included 24 clinically stable individuals diagnosed with bipolar I disorder with psychotic features, (BD+), 24 clinically stable individuals diagnosed with bipolar I disorder with no psychotic features (BD−), 30 individuals diagnosed with schizophrenia (SZ) and 24 control participants (NC). Participants were administered the Structured Clinical Interview for the DSM-IV (SCID-IV; First et al., 2002) to verify a diagnosis of BD+, BD−, or SZ for the groups. All the participants in the BD and SZ groups had a clinical history and a pre-existing diagnosis of either bipolar disorder or schizophrenia made by his or her treating psychiatrist. Participants were included in the BD+ group if they have ever experienced hallucinations or delusions during a mood episode as determined by the SCID-IV. A standardized demographic, medical history, and psychiatric history questionnaire was administered during the clinical interview to obtain information on family history of psychiatric diagnoses in first- and second-degree relatives, as well as personal psychiatric and medical history. Participants in the BD groups were determined to be clinically stable during evaluation using the SCID-IV and the standardized questionnaire, which confirmed that no manic, depressed, hypomanic, or mixed episodes were experienced in the last thirty days. All participants were between 18 and 65 years of age and spoke English as their first language.

Exclusion criteria for this study included having significant vision or hearing impairment (as determined by a brief screening process), an intellectual disability, a history of a neurological disorder, a diagnosis of substance or alcohol dependence in the last six months or substance or alcohol abuse in the last 30 days, and another affective/psychotic disorder other than BD or SZ including schizoaffective disorder or psychotic disorder NOS. Patients were also excluded if they had taken any medications in the past week that may affect CNS functioning other than those medications prescribed for treatment of BD or SZ. Exclusion criteria for the NC group were identical with the addition that individuals in the NC group had no history of an Axis I DSM-IV diagnosis other than an anxiety disorder. One control met criteria for a specific phobia, and another a history of obsessive–compulsive disorder as deemed by the SCID-IV, though neither participant had been formally diagnosed with these disorders. The BD and NC participants and 24 of the SZ participants were used in a previous investigation examining deficits across visual, auditory, and combined modalities using an emotion recognition task (Thaler et al., 2013b).

2.2. Measures

2.2.1. Demographic variables, IQ, and symptom ratings

Screening and diagnostic measures included the demographic questionnaire, the SCID-IV, a visual acuity test, and a pure-tone hearing test. Socioeconomic status (SES) was measured with the Hollingshead Index (Hollingshead, 1957), an objective measure based on weighted education and occupation levels in which higher scores indicate poorer SES. Full scale IQ was estimated with a dyadic short form of the Wechsler Adult Intelligence Scale – Third Edition (WAIS-III; Ringe et al., 2002; Wechsler, 1997). Mood and psychiatric symptoms were assessed with the Hamilton Depression Rating Scale (HAM-D; Hamilton, 1960), the Scale for the Assessment of Positive Symptoms (SAPS; Andreasen, 1983a), and the Scale for the Assessment of Negative Symptoms (SANS; Andreasen, 1983b). Hand dominance was determined by the Lateral Dominance Examination.

2.2.2. Social cognition tasks

2.2.2.1. Bell–Lysaker Emotion Recognition Task. The BLERT (Bell et al., 1997) is an audio-visual affect recognition task composed of 21 ten-second clips. In the clips an actor delivers one of three monologues in one of seven affective states three times, providing 21 items. The states are happiness, sadness, anger, fear, disgust, surprise, and no emotion. After each monologue, the tape is paused and the participant is prompted to select one of the seven affective states. The total number of items answered correctly was included as a variable in the factor analysis.

2.2.2.2. Picture Arrangement. The WAIS-III Picture Arrangement (PA) subtest is composed of 10 sets of cards with pictures of characters engaged in social scenarios. The cards have a logical order to them that conveys a coherent story with later items increasing in difficulty. Participants are required to sort the cards in the correct order, which is scored accordingly. The PA subtest is sensitive to social cognition deficits in SZ samples (Shean and Meyer, 2009) as well as BD samples (Shean et al., 2005), and has been identified as part of a separable social cognition factor in factor studies of the Wechsler scales (Allen and Barchard, 2009; Allen et al., 2007; Goldstein et al., 2008). The PA raw subtest score was used in our analyses.

2.2.2.3. Hinting Task. The Hinting Task (Corcoran et al., 1995) requires participants to infer the socially implied intentions of a character engaged in a dialogue with another character. Ten scenarios are presented and partial credit is awarded for concrete yet accurate replies. When an incorrect (or an incomplete) response is given designated prompts are presented to the participant allowing opportunity to earn partial credit. There is no discontinue criteria. This task provides a single raw total score, which was included in the analyses.