



Metacognition, social cognition, and symptoms in patients with first episode and prolonged psychoses



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ABSTRACT

While it has been documented that persons with prolonged schizophrenia have deficits in metacognition and social cognition, it is less clear whether these difficulties are already present during a first episode. To explore this issue we assessed and compared metacognition using the Metacognition Assessment Scale—Abbreviated (MAS-A) and social cognition using the Eyes, Hinting and Bell-Lysaker Emotional Recognition Tests (BLERT) in participants with first episode psychosis (FEP; $n = 26$), participants with a prolonged psychosis ($n = 72$), and a psychiatric control group consisting of persons with a substance use disorder and no history of psychosis ($n = 14$). Analyses revealed that both psychosis cohorts scored lower than controls on the MAS-A total and all subscales except metacognitive mastery. Compared to the FEP group, the persons with prolonged psychosis demonstrated greater metacognitive capacities only in those MAS-A domains reflective of the ability to understand the mental state of others and to see that others may have motivations and desires separate from their own. Other domains of metacognition did not differ between psychosis groups. The Eyes, Hinting and BLERT scores of the two psychosis groups did not differ but were poorer than those produced by the control group. Exploratory correlations in the FEP group showed a pattern similar to that previously observed in prolonged psychosis. Taken together, these findings suggest that while certain domains of metacognition could improve with prolonged psychosis, difficulties with global metacognition and social cognition may be stable features of the disorder and perhaps unique to psychosis.

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1. Introduction

Improving functional outcomes such as adequate self-care, social support, and vocational success, is a primary objective of modern psychiatric research and practice. Individuals with schizophrenia spectrum disorders face challenges in all of these areas, related, at least in part, to cognitive deficits and psychotic symptoms. However, the wide range of difficulties contributing to dysfunction in schizophrenia cannot be fully accounted for by symptoms and deficits in neurocognitive functioning (Penn et al., 1997; Casacchia and Roncone, 2004; Penn et al., 2008; Dimaggio et al., 2009), suggesting that there must be mediating and/or moderating factors (Green et al., 2012). Therefore, determination of potentially significant contributing psychological factors remains a vital step in understanding the complexity of psychotic disorders and

ultimately leading to the development of novel therapeutic interventions which target difficulties most proximate to impaired function.

Potential factors associated with global dysfunction could be driven by two related domains: metacognition and social cognition (Bora et al., 2006; Abdel-Hamid et al., 2009; Bell et al., 2009; Lysaker et al., 2010a,b; Hamm et al., 2012; Tas et al., 2012; Lysaker et al., 2013). Metacognition refers to the process of thinking about thinking, including a range of mental activities from recognizing discrete psychological phenomena (thoughts and emotions) to the synthesis of these elements into an integrated representation of self and others (Dimaggio et al., 2008; Brüne et al., 2011; Dimaggio et al., 2013; Lysaker et al., 2013). Social cognition involves combining cognitive processes required for social perception and interaction (Brown et al., 2012) including theory of mind (ToM), social perception, attributional bias, and emotion processing (Brüne, 2005; Green et al., 2008). Though they are overlapping constructs yet to be disentangled by the literature, metacognition and social cognition are both cognitive processes necessary for interpersonal psychological experiences. They diverge however in that metacognition involves more synthesis of complex experiences resulting in meta-

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representations that vary in complexity, adaptiveness, and flexibility (Lysaker et al., 2013).

Metacognition can be examined in terms of four major domains (Lysaker et al., 2005): self-reflectivity (comprehension of one's own mental states), other-reflectivity (comprehension of other's mental states), decentration (ability to see the world as existing with others having independent drives/motives), and metacognitive mastery (ability to use mental state knowledge to respond to social and psychological dilemmas). Individuals with prolonged psychosis generally have compromised metacognitive capacity which has been linked to symptoms (Lysaker et al., 2005, 2007; Abdel-Hamid et al., 2009; Buchy et al., 2009; Shean and Meyers, 2009; Bruno et al., 2012; Hamm et al., 2012; Lysaker et al., 2013), learning difficulties (Tas et al., 2012), and poorer motivation (Vohs and Lysaker, 2014) and psychosocial functioning (Langdon et al., 2001; Lysaker et al., 2005; Koren et al., 2006; Lysaker et al., 2011a).

Deficits in social cognition are also believed to be important factors in psychotic illness (Bell et al., 2009; Fett et al., 2011), with impairment identified in several domains, including disrupted ToM (Brüne, 2005), accurate identification of others' emotions (Johnston et al., 2010) and understanding of the underlying meaning of common social interactions (Brüne, 2005; Brüne and Brüne-Cohrs, 2006). Social cognition has been linked to negative and disorganized symptoms (Lysaker et al., 2013), poor social functioning (Bellack et al., 1990; Mueser et al., 1990), and re-hospitalization (Pinkham et al., 2003).

Recent data suggests that deficits in metacognition and social cognition may be relatively trait-like phenomenon. Metacognitive mastery was stable over a five month period (Lysaker et al., 2011b) while global metacognition was shown to be stable for six months (Hamm et al., 2012). Similarly, studies of social cognition have supported the contention that it may be a trait-related construct (Lysaker et al., 2011b; Biedermann et al., 2012). Nevertheless, one major limitation in this area thus far is that it has focused primarily on persons in prolonged phases of illness. While some data suggests that metacognitive-like processes such as self-reflectivity (Buchy et al., 2009) and social cognition (Bertrand et al., 2007; Koelkebeck et al., 2010; Quee et al., 2011) may be altered in FEP and potentially linked with symptoms (MacBeth et al., 2014), less is known about how specific processes differ when compared to those with prolonged psychosis.

To address this limitation and explore the hypotheses that metacognition and social cognition may be core deficits present during both FEP and prolonged phases, we administered a narrative-based assessment of metacognitive function and three measures of discrete social cognitive judgments. We hypothesized that no differences would be found in metacognition and social cognition between phases of the illness, but that both psychosis groups would differ from a psychiatric control group. Because this study presented a rare opportunity to explore relationships among metacognition, social cognition, and symptoms in FEP, which have already been linked in prolonged illness (Lysaker et al., 2005; Bell et al., 2009; Fett et al., 2011; Hamm et al., 2012; Lysaker et al., 2013), we also conducted correlational analyses in the FEP group.

2. Methods

2.1. Participants

All participants were between 18 and 65 years old, provided informed consent, and were tested by trained research personnel. Participants in the FEP and prolonged psychosis groups had SCID confirmed DSM-IV (American Psychiatric Association, 1994) diagnoses of schizophrenia or schizoaffective disorder, or Psychosis NOS in the FEP group only. Active substance abuse or dependence within three months of testing and history of mental retardation as documented in the medical record were exclusionary for both psychosis groups.

FEP participants were recruited from the Prevention and Recovery Center for Early Psychosis (PARC), a novel outpatient treatment and research program affiliated with Wishard Health Services and the Indiana

University School of Medicine for young individuals in the early stages of psychotic illness. They were within five years of initial documented diagnosis of a schizophrenia spectrum disorder ($n = 26$). The prolonged sample was recruited from a Midwestern Veterans' Affairs Medical Center (VAMC) or from a local Community Mental Health Center ($n = 72$) with documented psychotic illness dating back more than 5 years prior to enrollment. They were in a non-acute phase of disorder (no hospitalizations or medication changes within 30 days) and recruited through an ongoing trial evaluating cognitive therapy and vocational rehabilitation.

Finally, the psychiatric control group was recruited from a residential treatment center for substance use disorders ($n = 14$). This group was recruited as part of a program evaluation of residential programs for substance use disorders. Criteria for inclusion in this study was a SCID confirmed DSM-IV diagnosis of substance abuse or dependence, but without any diagnosis of psychotic disorder. All had been abstinent from alcohol and substances for a minimum of 30 days as confirmed with random drug screens and breathalyzers performed at the residential center. To match the ages of the FEP group we only selected participants from this sample with ages of 40 or less. Age, education, and sex of all three groups are listed in Table 1.

2.2. Instruments

2.2.1. Measurement of metacognition

Metacognitive capacity was assessed by using the *Metacognition Assessment Scale—Abbreviated* (MAS-A; Lysaker et al., 2005) to rate the *Indiana Psychiatric Illness Interview* (IPII; Lysaker et al., 2002). The IPII is the semi-structured interview developed to assess illness narratives, which typically last between 30 and 60 min. Responses are recorded and transcribed. The MAS-A was developed on the basis of the MAS (Semerari et al., 2003) in collaboration with those authors in order to assess metacognition as manifest in psychosis. The MAS-A differs from other assessments in that it focuses on spontaneous metacognitive functions. Good inter-rater reliability (intraclass correlation = 0.82) and validity have been presented elsewhere (Lysaker et al., 2011b). The MAS-A includes subscales in four domains: "Understanding of one's own mind"; "Understanding of others' minds"; "Decentration"; and "Metacognitive Mastery."

2.2.2. Measurement of social cognition

The Bell-Lysaker Emotional Recognition Task (BLERT; Bell et al., 1997) is considered a measure of affective recognition. It measures the ability to identify affective cues in videotaped stimuli. Participants are presented with 21 video segments, including two positive, four negative, and one neutral affect. They then determine which emotional state best describes what the actor is experiencing. Reliability, categorical stability, and validity have been reported (Bell et al., 2010).

Hinting Task (Corcoran and Frith, 2005) is often considered an assessment of Theory of Mind (the ability to discern the emotional or thought experience of others) or mental state decoding. The version used was rewritten in American English (Greig et al., 2004). It is a series of self-report tasks that require participants to judge the intentions of a fictional character on the basis of "hints" embedded within a story. The tasks include 10 items and a score of "2" is given if the intention is guessed correctly and a score of "1" is given if a correct guess is made after an explicit hint.

The Reading the Mind in the Eyes Test (Eyes Test; Baron-Cohen et al., 2001) is also considered an assessment of mental state decoding. This instrument consists of 36 black and white photographs of the eye region, surrounded by four words used to describe emotions or thoughts expressed by the eyes. Participants then select the word they believe is the best descriptor. The Eyes Test has been previously used successfully in studies involving patients with schizophrenia (Lysaker et al., 2012).

2.2.3. Measurement of symptoms

The Positive and Negative Syndrome Scale (PANSS) is a 30 item scale designed to be completed by a trained rater at the conclusion of an

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