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journal homepage: [www.elsevier.com/locate/psychres](http://www.elsevier.com/locate/psychres)

# Metacognition and general functioning in patients with schizophrenia and a history of criminal behavior



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## ARTICLE INFO

### Article history:

Received 22 May 2014

Received in revised form

9 November 2014

Accepted 21 December 2014

Available online 31 December 2014

### Keywords:

Mentalizing

Social functioning

Psychosis

Psychotic symptoms

## ABSTRACT

Metacognitive difficulties have been linked to social dysfunction in schizophrenia. However, research examining the role of metacognition in the social functioning of patients with a history of violence and criminality is very limited. This research is especially important for this group given their relatively poor prognosis and their risk to reoffend, as well as the promising benefits of integrating metacognitive approaches in psychosocial treatments. In this study, the association between metacognition and global social functioning was examined in 79 patients with schizophrenia with a criminal background. We also examined the association of positive, negative and disorganized symptoms with social functioning and the extent to which metacognition mediates this association. The results indicate that poor social functioning is associated with metacognitive difficulties and higher levels of delusions and Conceptual Disorganization. In addition, mediation analyses showed that metacognition accounted for about 11% of the total effect size of the association between delusions and social dysfunction, suggesting that the relationship between delusions and social dysfunction is partially driven by impaired metacognition. These findings underscore the importance of interventions designed to enhance the patients' metacognitive capacities, that is, the more proximal capacities linked to poorer social functioning.

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## 1. Introduction

Impairments in psychosocial functioning are characteristic features of schizophrenia spectrum disorders (Bellack et al., 1990). These include reduced levels of self-care (Brüne et al., 2011), vocational functioning (Lysaker et al., 1994) and social relationships (Penn et al., 1997; Roberts and Penn, 2013) all of which not only reduce the patients' quality of life but also negatively influence the prognosis of the disorder and serve as a risk factor for relapse and the development of comorbid psychopathology (Perlick et al., 1992; Sullivan et al., 1990; Tien and Eaton, 1992). In light of findings showing that only a small proportion of the variance in psychosocial functioning in schizophrenia is explained by the conventional symptomatology described within the diagnostic systems (Ertuğrul and Uluğ, 2002; McGurk and Meltzer, 2000; Rabinowitz et al., 2012), efforts have been underway to understand the more subtle causes of psychosocial deficits

in this population. These efforts point to possible mediating variables that could explain the association between symptom severity and psychosocial functioning in schizophrenia.

One such possible mediating variable that could explain the link between psychotic symptoms and psychosocial functioning is the capacity to recognize and reason about self and other mental states. Difficulties in this capacity are often associated with failures to understand mental states and are apparent when engaged in both emotionally and unemotionally arousing interactions during the pursuit of personal goals (Liotti and Gilbert, 2011). In this paper, we will refer to the reflections people form about themselves and others as metacognition. Specifically, metacognition refers to a spectrum of mental activities that involves thinking about thinking, ranging from more discrete acts in which people recognize specific thoughts and feelings to more synthetic acts in which an array of intentions, thoughts, feelings, and connections between events are integrated into larger complex representations (Lysaker et al., 2013a, 2013b; Semerari et al., 2007, 2003).

Although metacognition has been considered a part of social cognition (Pinkham et al., 2013), one operational difference is that metacognition includes many different aspects, ranging from the

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ability to recognize specific aspects of subjective experience such as an emotion or a belief, to more synthetic aspects such as the ability to reason about the cause–effect links between different mental states or the ability to maintain a sense of unity and thus an understanding of different aspects of internal experience. At issue with respect to synthetic forms of metacognition is not specifically what one thinks or correctly notices, but is instead whether basic elements of experience are recognized and then synthesized into meaningful wholes. Synthetic metacognitive acts also affect life in a different manner than do specific beliefs or singular judgments, in that they lend meaning to events, and thus, supply reasons as to *why* one carries out a certain act, as well as premises for deciding *what* is the best course of action to resolve dilemmas encountered in daily interactions (Lysaker et al., 2013a, 2013b). As such, metacognitive capacities are essential for the understanding of *cognitive* and *affective* mental states (Abu-Akel and Shamay-Tsoory, 2011; Semerari et al., 2003), the management of distress (Weiss et al., 2006) and empathy (Blair, 2005; Shamay-Tsoory et al., 2010).

Deficits in metacognition have been found in many schizophrenia samples, both in earlier and later phases of the illness (Vohs et al., 2014; Lysaker et al., 2005; Abu-Akel and Abushua'leh, 2004; Ang and Pridmore, 2009; Bora et al., 2009; Brune, 2005; Chung et al., 2013; Frith, 2004; Hamm et al., 2012; Harrington et al., 2005; Lysaker et al., 2011a, 2011b, 2014). For example, it has been shown that patients with schizophrenia have lesser capacities for metacognition compared with participants with chronic non-psychiatric conditions and at least two other prolonged psychiatric conditions (PTSD and substance abuse) (Lysaker et al., 2014). In addition, studies consistently report a link between schizophrenia and social dysfunction, which has been attributed by some to the presence of metacognitive difficulties. However, studies linking metacognition and poor social functioning in schizophrenia have drawn on small sample sizes and did not systematically control for essential confounding factors such as the presence of co-morbid clinical syndromes (i.e. depression, anxiety, bi-polar disorders, drug and alcohol dependence etc.), socio-demographic factors (i.e. gender, age, educational level, socio-economic status, ethnicity), and the influence of present state emotional arousal at the time of assessing metacognitive abilities, which has been shown to affect metacognitive performance (Bateman and Fonagy, 2011). Moreover, there are a limited number of studies that examined the role of metacognition in understanding criminal behavior in patients with schizophrenia (Bo et al., 2013), and to the authors' knowledge, there is only one study to date that explored the relationship of metacognition with past history of violence in patients with schizophrenia (Mitchell et al., 2012). Determining the role of metacognition in functional outcome is thus especially important for this group given their relatively poor prognosis and their potential to reoffend (Witt et al., 2013). Research has also suggested that metacognition may be addressed in a range of psychosocial treatments (Lysaker et al., 2010a, 2010b; Salvatore et al., 2012a, 2012b) and so confirmation of the role of metacognitive deficits in social dysfunction in this group could offer important possibilities for treatment and recovery.

In the current study, we extended this work by accounting for these limitations and examined the nature of the association of metacognition with global social functioning in a relatively large sample of primarily criminal and violent patients with schizophrenia. Specifically, we tested the following four hypotheses. First, we predicted that lower levels of social functioning were associated with decreased metacognition. Second, we predicted that poor metacognition was associated with symptom severity. Based on previous work, we predicted that deficits in metacognition would be specifically associated with the negative symptoms

Blunted Affect and emotional withdrawal (Nicolò et al., 2012; Mitchell et al., 2012; Hamm et al., 2012; Rabin et al., 2014; McLeod et al., 2013), the positive symptoms hallucinations and delusions (Bjørkly, 2002a, 2002b), and disorganization symptoms (Lysaker et al., 2005, 2012a, 2012b). Finally, we predicted that metacognition would mediate the relationship between symptom severity and social functioning. It is important to note that our intention is not to examine what causes criminal behavior, but rather to gain insight into how metacognition, symptom severity and social functioning are related in schizophrenia patients with a history of criminal behavior.

## 2. Methods

### 2.1. Participants

Seventy-nine patients fulfilling the diagnostic criteria for schizophrenia (World Health Organization, 1993) participated in the study. Patients were enrolled from both in- and out-patient facilities around Denmark. All patients had a history of criminal behavior as indicated in the patients' official criminal record. All 79 participants signed written informed consent prior to participation. The study was approved by the Danish Ethical Committee and was carried out in accordance with the latest version of the Declaration of Helsinki. Demographic features of the participants are listed in Table 1.

### 2.2. Measures

The abbreviated version of the *Metacognitive Assessment Scale (MAS-A)* (Semerari et al., 2003) is a rating scale developed to measure metacognition. The scale consists of four subcomponents: *Self-Reflectivity* or the comprehension of one's own mental states, *Understanding the others' mind* or the comprehension of mental states of other individuals, *Decentration* or the ability to see that others can have independent motives and unique perspectives on life events, and *Mastery* or the ability to work through one's representations and mental states to implement effective action strategies in order to accomplish cognitive tasks or cope with problematic mental states. Each scale consists of a series of steps, with increasing levels of complexity. The total score (or MAS-Total) ranges from 0 to 28 and is generated by summing the scores of the four subscales. Table 2.

The MAS-A is normally applied to interview transcripts of the Indiana Psychiatric Illness Interview (IPII; Lysaker et al., 2002). However, given the violent record of these patients, we thought that an appropriate instrument to investigate their metacognitive capacities was an interview tapping into aspects related to psychopathy. Accordingly, we used sections of the video-recordings of the Psychopathy Checklist-Revised (PCL-R; Hare, 2003). Importantly, the sections of the PCL-R interview that were used to rate metacognition in this study did not include narratives about criminal episodes. Rather, the sections that were used recounted

**Table 1**  
Demographic features of the schizophrenia patients.

Demographics	Sample (N=79)
Age (Mean ± S.D.)	36.9 ± 10.4
Range in years	18–63
Gender	
Male	64 (81.0%)
Female	15 (19.0%)
Ethnicity	
Danish	67 (84.8%)
Immigrant	9 (11.4%)
Descendent	3 (3.8%)
Educational level	
Not finished primary and/or secondary school	20 (25.3%)
Completed primary and secondary school	35 (44.3%)
Completed high School	7 (8.9%)
Completed higher education (3 < years)	17 (21.5%)
Employment	
Employed	4 (5.1%)
Unemployed	8 (10.1%)
Disability pension	67 (84.8%)
Receiving anti-psychotics	75 (94.9%)

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