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A closer look at the relationship between the subdomains of social functioning, social cognition and symptomatology in clinically stable patients with schizophrenia

Elliot Clayton Brown[a,b,*], Cumhur Tas[b,c], Huseyin Can[d], Aysen Esen-Danaci[e], Martin Brüne[b]

[a]Maryland Psychiatric Research Centre, University of Maryland School of Medicine, Baltimore, MD, USA
[b]Research Department of Cognitive Neuropsychiatry and Psychiatric Preventive Medicine, LWL University Hospital, Ruhr University Bochum, Germany
[c]Department of Psychology, Üsküdar University, Istanbul, Turkey
[d]Batman Aile Sağlığı Merkezi, Batman, Turkey
[e]Department of Psychiatry, Celal Bayar University, Manisa, Turkey

Abstract

Impairments in social functioning commonly seen in schizophrenia are thought to be mediated by deficits in the domains of social cognition. Some previous research has explored how social cognitive skills and psychotic symptoms are associated with social functioning, however these associations are still under debate. The main aim of this study was to investigate the relationship between different domains of social cognition and psychotic symptomatology, and also to look at the relationships with individual subdomains of social functioning within a clinically stable schizophrenia population. 45 outpatients were recruited and symptoms were assessed with the PANSS, and measures of emotion processing, affective and cognitive theory of mind (ToM), mental state reasoning attributional biases, and social functioning were taken. A correlational analysis was performed with the data. Following this, a regression analysis was used to reveal which domains of social cognition best predicted psychotic symptoms. In this stable group of patients, our results support the suggestion of a likely distinction between affective and cognitive components of ToM. The study also demonstrated that ToM and mental state reasoning were the best predictors of psychotic symptoms. Here we reveal that cognitive ToM had the most widespread relationship with social functioning, across multiple subdomains, while only some specific subdomains of social functioning correlated with other domains of social cognition and symptomatology. Further to this, positive symptoms were associated with much fewer subdomains of social functioning than negative and general symptoms. These findings imply that different aspects of social functioning may be served by different domains of social cognition and symptomatology.

1. Introduction

Schizophrenia is a chronic and debilitating illness of which poor social functioning is a core characteristic. The ability to function successfully in the social world requires an accurate understanding and interpretation of other people's behaviour. The knowledge and skills utilised in social interactions are founded upon a set of cognitive processes that fall under the category of social cognition. Deficits in social cognition have been found to have a direct impact on the rate of relapse and symptom severity in schizophrenia [1,2]. Much research has revealed that neurocognitive deficits such as working memory, speed of processing, attention, problem solving and executive function contribute moderately (around 20%–60%) to the variance in social functioning in schizophrenia [3–5]. Other work has suggested that social cognitive deficits may explain at least as much of the variance in social functioning as non-social cognitive deficits, and are likely to have an even more substantial and mediating role in social functioning and functional outcome [6–9]. It is clear that the ability to process socially relevant information relies on neurocognition, however, research shows that neurocognition and social cognition are largely distinct domains [1,10,11]. It is also

* Corresponding author. Maryland Psychiatric Research Centre (MPRC), Department of Psychiatry, University of Maryland School of Medicine, 55 Wade Avenue, P.O. Box 21247, Baltimore, MD 21228, USA.
E-mail address: elliot.c.brown@gmail.com (E.C. Brown).

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thought that social cognition is composed of different domains that may be partially independent [12], and are currently treated separately in social cognition training for schizophrenia [2].

In schizophrenia, some specific domains of social cognition have been identified to be particularly at a deficit [12], including emotion perception, theory of mind and attributional style. Emotion perception involves the reading of social emotional cues, mainly from facial expressions, which is also intrinsic to the awareness and understanding of one's own emotional experiences [13]. Theory of mind is the ability to understand other peoples' intentions and beliefs, and being able to put oneself 'in others' shoes' [14]. Attributional style refers to the tendency to attribute the cause of negative or positive events to oneself or to others [15]. A crucial question for research on social cognition in schizophrenia to address is how clear the boundaries between different domains of social cognitive deficits in schizophrenia are. A handful of studies using factor analysis with different domains of social cognition have found inconsistent results, most probably due to the use of different measures. Van Hooren et al. [16] demonstrated that theory of mind, attributional bias and agency detection were loaded separately in three different factors, following an exploratory factor analysis on a battery of measures of neurocognition and social cognition. Another study revealed a four-factor solution with theory of mind, affect recognition, egocentricity and rapport loading in separate factors [17]. More recently, a factor analysis from Mancuso et al. [18] found the three domains of hostile attributional style, low-level social cue detection and high-level inferential and regulatory processes loading in separate factors. Although none of these factors correlated with negative symptoms, whereas only hostile attributional style correlated with positive symptoms. It is evident that there is some interaction between deficits in social cognition and psychotic symptomatology, which require consideration when discussing functional outcome.

The inherent social nature of many psychotic symptoms, such as passivity symptoms and social withdrawal, implies a direct relationship between social cognition and symptomatology [18]. Emotion recognition deficits have generally been found to be more specifically associated with the severity of negative and affective symptoms [19], as well as poor vocational and global functioning [20]. Some have also found that the affective dimensions of theory of mind, i.e. reading others' emotional states, is also more specifically associated with negative symptoms [21]. In fact, neuroimaging studies have revealed a close relationship between emotion perception and affective theory of mind [22]. According to earlier work of theory of mind deficits in schizophrenia, remitted patients were found to have intact theory of mind abilities, and it was therefore proposed that theory of mind deficits were causally related to psychotic symptoms, as a result of impaired self-monitoring [23]. However, more recently, a meta-analysis suggests that this relationship may not be so clear or direct [24]. Bentall et al. [25] have suggested that biases in self-representation can be caused by biases in causal attributions, such as an over-self-serving attributional bias, in which persecutory delusions and paranoid thoughts stem from the causal attribution of negative events to external agents. An increased externalizing bias has been found to be associated with reduced insight in a population with schizophrenia [26]. Although most notably, neither externalizing nor personalizing biases were related to theory of mind in this study, and additionally, patients with more misattribution biases were less flexible in emotion processing. In general, several studies have found a substantial relationship between positive symptoms, particularly paranoid delusions and a jumping-to-conclusions and attributional bias [27,28].

One main goal for research exploring the relationship between social cognition and symptomatology in schizophrenia is to understand how this can impact on real-world social functioning and functional outcome [29,30]. The majority of studies investigating social cognition and functional outcome has demonstrated a positive association between the two, as shown from the studies reviewed by Fett and colleagues [31]. However, the strength of the relationship between social cognition and social functioning varies substantially. This is likely due to the lack of standardization of measures of social cognition and functional outcome. Two recent meta-analyses [31,32] have revealed some limitations and methodological inconsistencies in the previous literature, therefore preventing these meta-analyses from being completely comprehensive. In addition, there is relatively little work documenting the intercorrelations between domains of social cognition, and the subdomains of social functioning, as many have pooled potentially separable dimensions together to report only aggregated scores [e.g. [33]].

Despite the large body of research exploring the associations between social cognition, social functioning and psychotic symptomatology, more work is required to clarify how the different domains of social cognition relate to one another, how these may be associated with positive and negative symptoms, and how these associations translate to real-world social functioning and persist during remission of psychotic symptoms. In this article, we follow the methodological recommendations made in the recent meta-analysis from Fett and colleagues [31] to facilitate the synthesis of data for future systematic reviews. Accordingly, the aim of the study was to explore the interrelationships between deficits in different domains, and sub-domains, of social cognition and social functioning in a group of clinically stable schizophrenia patients. We were also interested in looking at how these related to different factors on the PANSS, and which domains of social cognition and social functioning were best predicted by different dimensions of symptomatology. Measures of non-social neurocognition were not included in this study due to the demanding nature of these assessments, in consideration of the numerous