Social cognition in psychosis: Multidimensional structure, clinical correlates, and relationship with functional outcome

Francesco Mancuso [a,b,c], William P. Horan [a,b,*], Robert S. Kern [a,b], Michael F. Green [a,b]

[a] Department of Psychiatry and Biobehavioral Sciences, Geffen School of Medicine at University of California, Los Angeles, USA
[b] VA Greater Los Angeles Healthcare System, VISN22 MIRECC, USA
[c] Department of Psychiatry, University of Naples SUN, Naples, Italy

ARTICLE INFO

ABSTRACT

Social cognitive impairments are common, detectable across a wide range of tasks, and appear to play a key role in explaining poor outcome in schizophrenia and related psychotic disorders. However, little is known about the underlying factor structure of social cognition in people with psychotic disorders due to a lack of exploratory factor analyses using a relatively comprehensive social cognitive assessment battery. In a sample of 85 outpatients with psychosis, we examined the factor structure and clinical/functional correlates of eight indexes derived from five social cognition tasks that span the domains of emotional processing, social perception, attributional style, and Theory of Mind. Exploratory factor analysis revealed three factors with relatively low inter-correlations that explained a total of 54% of the variance: (1) Hostile attributional style, (2) Lower-level social cue detection, and (3) Higher-level inferential and regulatory processes. None of the factors showed significant correlations with negative symptoms. Factor 1 significantly correlated with clinical symptoms (positive, depression-anxiety, agitation) but not functional outcome, whereas Factors 2 and 3 significantly correlated with functional outcome (functional capacity and real-world social and work functioning) but not clinical symptoms. Furthermore, Factor 2 accounted for unique incremental variance in functional capacity, above and beyond non-social neurocognition (measured with MATRICS Consensus Cognitive Battery) and negative symptoms. Results suggest that multiple separable dimensions of social cognition can be identified in psychosis, and these factors show distinct patterns of correlation with clinical features and functional outcome.

© 2010 Elsevier B.V. All rights reserved.

1. Introduction

Social cognition has emerged as a high priority topic for research in schizophrenia and related psychotic disorders that may help explain poor outcomes. Social cognition is a broad, multifaceted construct that refers to the cognitive and emotional functions required to understand and predict other people's mental states and behavior (Adolphs, 2009; Ochsner, 2008). Research has documented impairments across a diverse array of social cognitive processes, most commonly emotional processing, social knowledge/perception, attributional style, and Theory of Mind (Green and Horan, 2010). There have been two distinct goals of social cognitive research in schizophrenia: One devoted to understanding the nature of specific clinical symptoms (e.g., relations to paranoia or thought control) and another devoted to social cognition's role in functional outcome. Despite the proliferation of research in this promising area, several fundamental issues remain largely unexplored (Green et al., 2005, 2008).

One question concerns the underlying structure of social cognition in schizophrenia. Although there is a general consensus that social cognition is empirically and neurobiologically separable from (though related to) non-social

* Corresponding author. UCLA Department of Psychiatry & Biobehavioral Sciences, 300 UCLA Medical Plaza, Suite 2255, Los Angeles, CA 90095-6968, USA. Tel.: +1 310 206 8181 (voice); fax: +1 310 206 3651.
E-mail address: horan@ucla.edu (W.P. Horan).

neurocognition (Green et al., 2008; Fett et al., 2011), it is not known whether the social cognitive assessments used in schizophrenia reflect a single factor or a cluster of separable factors. A few studies focusing on a narrow selection of social cognition measures suggest the presence of separable factors. For example, an exploratory factor analysis of neurocognitive and social cognitive measures found that indices of Theory of Mind, attributional bias, and agency detection loaded on three different factors (van Hooren et al., 2008). Another study using confirmatory factor analyses found that a four-factor model provided a good fit to measures of social cognition and social behavior (affect recognition, Theory of Mind, egocentricity, and rapport) (Bell et al., 2009). Along these lines, emotional intelligence shows a multidimensional structure in people with psychotic disorders that differs from healthy control subjects (Eack et al., 2009). The current study aimed to help clarify the basic structure of social cognition by examining performance across a wide range of social cognitive tasks.

A second question concerns social cognition's relation to clinical symptoms and functional outcome. Although under-standing clinical symptoms has been one key motivation to study social cognition in schizophrenia, the literature pro-vides a generally mixed picture. While recent modeling studies suggest that social cognition is separable from negative symptoms (Rassovsky et al., 2010; Sergi et al., 2007), some studies report associations with particular social cognitive tests (e.g., Kohler et al., 2010). Relations to positive symptoms (e.g., thought disorder, hallucinations) are simi-larly inconsistent (Corcoran et al., 2008; Shamay-Tsoory et al., 2007; Woodward et al., 2009), though there has been somewhat greater consistency for associations between attributional style and paranoid delusions or beliefs (Bentall et al., 2001; Combs et al., 2007, 2009; Fornells-Ambrojo and Garety, 2009; Kinderman and Bentall, 1996). Regarding linkages to functional outcome, most studies have focused on emotion and social perception (Couture et al., 2006; Fett et al., 2011). In addition, many studies include a limited assessment of functional outcome and often do not distin-guish between functional capacity (what one can do on competence measures) and real-world functioning (what one actually does in the community), which is increasingly recognized as a critical distinction (Bowie et al., 2006). The current study aimed to address these issues by incorporating comprehensive assessments of symptoms and functioning.

A third question is whether social cognition has "added value" in explaining functional outcome above and beyond neurocognition and clinical symptoms. Notably, at the level of simple correlations, a recent meta-analysis reported that social cognition has generally stronger relations to functional outcome than does neurocognition (Fett et al., 2011). A few studies have found that social cognition (mainly emotion and social perception) does account for unique variance in outcome above and beyond neurocognition (Horan et al., in press). The current study used a relatively comprehensive social cognitive battery to further address whether social cognition plays a unique role in explaining functional outcome.

The primary goal of this research was to evaluate the factor structure of social cognition in a sample of outpatients with psychotic disorders. We used five different tests that cover the four most commonly investigated domains of social cognition in schizophrenia. Secondary goals were to: (1) examine correlations between the derived factor(s) and neurocognition, symptoms, and functional outcome, and (2) investigate whether the social cognitive factor(s) uniquely account for incremental variance in functional outcome, above and beyond neurocognition and symptoms.

2. Methods

2.1. Participants

Eighty-five outpatients were recruited from the VA Greater Los Angeles Healthcare System (VAGLAHS) and local community mental health centers. Patients met DSM-IV criteria for schizophrenia, schizoaffective disorder, or psychosis NOS (not secondary to substance use disorder) as determined by medical records and consultation with treating psychiatrists. Subjects were clinically stable (no psychiatric hospitalizations in the past 6 months, same antipsychotic medication for past 3 months). Exclusion criteria were current or past neurological disorder (e.g., epilepsy), mental retarda-tion, or substance use disorder within the past month. Antipsychotic medication type and dose were left to the discretion of the treating physician. All participants had the capacity to give informed consent and provided written informed consent after all procedures were fully explained in accordance with procedures approved by the Institutional Review Board at the VAGLAHS. The participants were enrolled in a clinical trial comparing psychosocial interventions for social cognition and neurocognition (Horan et al., submitted); the current study used data from the baseline assessments.

2.2. Social cognitive assessment

(1) Emotional processing was assessed with two tests: (a) The *Facial Emotion Identification Test* (FEIT), in which subjects view 56 digital pictures of faces from the Ekman (2004) picture set and select which emotion is expressed (happy, sad, angry, afraid, surprised, disgusted or neutral). The index of accuracy is the total number of correct items. (b) The *Managing Emotions* subtest of the Mayer–Salovey–Caruso Emotional Intelligence Test (MSCEIT) (Mayer et al., 2002, 2003) comprises two 2 subscales that examine the regulation of emotions in oneself and in one's relationships with others. These subscales include vignettes of various situations, along with ways to cope with the emotions depicted in these vignettes. Subjects were required to indicate the effectiveness of each solution, ranging from one (very ineffective) to five (very effective). A total score was derived using the MSCEIT General Consensus method.

(2) Social perception was assessed with The Half-Profile of Nonverbal Sensitivity (PONS) (Ambady et al., 1995; Rosenthal et al., 1979). The 110 scenes in this videotape-based measure last two seconds and contain facial expres-sions, voice intonations, and/or bodily gestures of a Caucasian female. After watching each scene, participants select which of two labels better describes a situation that would generate the social cue(s). The index of accuracy is the total number of correct items.