



Emotional experience predicts social adjustment independent of neurocognition and social cognition in schizophrenia

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ARTICLE INFO

Article history:

Received 3 September 2009

Received in revised form 26 November 2009

Accepted 4 December 2009

Available online 3 January 2010

Keywords:

Schizophrenia

Cognition

Social cognition

Emotional experience

Functional outcome

ABSTRACT

Background: Emotional abnormalities are prominent features of schizophrenia. While the capacity for emotions is essential to social adaptation, little is known about the role of emotional experience in the social dysfunction observed in schizophrenia.

Objective: This study examined the contribution of emotional experience, neurocognition, and social cognition to functional outcome in schizophrenia.

Method: Self-reported emotional experience (anhedonia, affect intensity, and emotion frequency) was assessed in 33 stable schizophrenic/schizoaffective patients and 33 healthy controls. Symptoms, neurocognition, social cognition, and functional outcome were also assessed.

Results: Patients and controls exhibited good internal reliability on all self-report scales, except for negative affect intensity. Patients reported equally intense but less frequent positive emotions, more intense and frequent negative emotions, and more anhedonia. Results of hierarchical regression analyses showed that emotional experience accounted for significant amounts of variance of social adjustment independent of neurocognition and social cognition.

Conclusion: These data show that emotional experience can be reliably assessed and is an important determinant of functional outcome in schizophrenia.

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1. Introduction

Emotional abnormalities are prominent features of schizophrenia. Kraepelin and Bleuler noted pervasive disturbances in emotional characteristics, such as flat affect and loss of pleasure, signs which now serve as important diagnostic criteria of schizophrenia (American Psychiatric Association, 1994; World Health Organization, 1992). Convergent with the clinical observation of blunted affect in schizophrenia patients, experiments have shown that individuals with schizophrenia display fewer facial and vocal expressions in response to emotion-eliciting stimuli (e.g., videotapes, food,

beverages, and social role plays) compared with healthy controls (see for review Kring and Moran, 2008).

Diminished emotion expression, however, does not necessarily mean a lesser capacity to experience emotions. Schizophrenia patients are well known to exhibit significant clinical syndromes reflecting negative emotions, such as anxiety and depression (Siris et al., 2001). In emotion-elicitation experiments, schizophrenia patients often report as much and as intense subjective emotions as normal controls (Aghvli et al., 2003; Berenbaum and Oltmanns, 1992; Kring et al., 1993; Kring and Neale, 1996), although some groups have found reduced responses to positive stimuli (Henry et al., 2007; Paradiso et al., 2003; Quirk et al., 1998). Outside the laboratory, experience-sampling studies have shown that patients experience more intense negative emotions but less intense positive emotions in daily life than controls (Myin-Germeys et al., 2000). These research findings suggest a preserved or enhanced ability to

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experience negative emotions in schizophrenia, but the capacity to experience positive emotions, particularly pleasurable feelings, remains unclear.

There are numerous reports of reduced hedonic capacity in patients with schizophrenia (Berenbaum and Oltmanns, 1992; Blanchard et al., 1998, 2001). These results were often obtained using conventional measuring scales of anhedonia that require substantial projection and anticipation of pleasurable experience from activities that may rarely occur in many individuals with schizophrenia (e.g., “Trying new foods is something I have always enjoyed,” “It’s fun to sing with other people”). Therefore, answers to conventional anhedonia questions may reflect reduced encounters of pleasurable experience rather than diminished capacity to experience pleasure. To reconcile the conflicting findings on hedonic capacity in schizophrenia obtained using conventional anhedonia scales and laboratory approaches, Gard et al. (2007) hypothesized and showed evidence for an impairment in anticipating pleasure but intact ability to experience consumatory (“in-the-moment”) pleasure in a sample of patients with schizophrenia.

Emotional disturbances in schizophrenia also include compromised abilities to perceive emotions accurately (Addington and Addington, 1998; Habel et al., 2006; Hooker and Park, 2002; Kohler et al., 2000, 2003; Kucharska-Pietura et al., 2005; Sachs et al., 2004; Schneider et al., 2006). As emotions frequently occur in the context of social intercourse, interpreted emotional signals form an important part of social cognition. The capacity for inferring internal emotional states from facial expressions is also impaired in schizophrenia (see for review Brune, 2005). Since perceiving others’ emotions and intentions is a critical step in managing one’s social environment, deficits in these capacities can lead to problems in social adjustment. Indeed, a number of studies have shown that difficulties in emotion perception predict poor functional outcome in schizophrenia (Brekke et al., 2007; Kee et al., 2003; Mueser et al., 1996; Penn et al., 1996; Poole et al., 2000). Furthermore, emerging data suggest that the robust relationship between neurocognitive impairment and social dysfunction found in the schizophrenia literature (see Green et al., 2000, 2004) may, in fact, be mediated by social cognition (Addington et al., 2006; Brekke et al., 2005; Sergi et al., 2006, 2007; Vauth et al., 2004).

Is social functioning also a function of internal emotional experience in schizophrenia? We can imagine that if a person is unable to feel happiness or sadness, his inability to use emotions in social contexts may interfere with social relationships. On the one hand, experimentally-elicited, “in the moment” assays of emotion do not correlate significantly with functional outcome across several domains (Herbener et al., 2008). On the other hand, data suggest that increased trait negative affect (Horan and Blanchard, 2003), increased anhedonia (Blanchard et al., 1998; Herbener et al., 2005), and diminished subjective affect (Cohen et al., 2005) are related to poorer functioning in schizophrenia. In addition, anxiety and depression—negative emotions often embedded in the concept of clinical syndromes—are associated with poorer clinical and social outcome in schizophrenia (Conley et al., 2007; Sands and Harrow, 1999; Wetherell et al., 2003). Given that elicited emotion in laboratory settings may not reflect the relevant range of psychological states in schizophrenia, we sought to address the question whether or not other measures of emotion, such as trait-like

measures of intensity or recent experiences, would show a relationship with social outcome.

In the present study, we assessed converging measures of emotional experience, social cognition, social function and neurocognition. We aimed to replicate the findings that: (1) Neurocognition predicts functional outcome in schizophrenia; and (2) Social cognition, in addition to neurocognition, explains a significant amount of variance of functional outcome in schizophrenia. Central to the question of the role of emotion in schizophrenia, we hypothesized that emotional experience could be reliably assessed by self-report measures and would predict functional outcome independent of neurocognition and social cognition in schizophrenia.

2. Methods

2.1. Participants

Thirty-three outpatients who met the DSM-IV (American Psychiatric Association, 1994) criteria for schizophrenia or schizoaffective disorder were recruited from a local community mental health center and a university clinic. Patients who were unable to give informed consent, had other active Axis I disorders, a history of closed head injury, a history of alcohol or substance abuse/dependence in the past 6 months, or were on a court order treatment were excluded.

Thirty-three healthy controls were recruited through community advertisements. They were matched to the patients for age, gender, parental education, and family socioeconomic status. Exclusion criteria for control participants included lifetime history of mental illness, closed head injury, alcohol/substance dependence, history of alcohol/substance abuse in the past 5 years, and having any first-degree relatives with evidence of serious mental illness (e.g., psychotropic treatment, electroconvulsive therapy, or hospitalization).

All participants participated in one of two different functional magnetic resonance imaging (fMRI) experiments, the focus of which is out of the scope of this article and the results are not reported here.

2.2. Assessments

Clinical diagnoses were established or ruled out using the Structured Clinical Interview for the DSM-IV (SCID-I; First et al., 1995) by a trained master’s level research associate. A senior research psychiatrist (SFT) verified the diagnoses and assessed patients’ symptomatic severity with the Brief Psychiatric Rating Scale (BPRS; Overall and Gorham, 1962). The subscore for positive symptoms was obtained by summing items of Hallucinatory Behavior, Unusual Thought Content, Suspiciousness, and Conceptual Disorganization; the negative symptom subscore was the sum of Emotional Withdrawal, Motor Retardation, and Flat Affect.

Premorbid IQ was estimated with the Reading subtest of the Wide Range Achievement Test (WRAT3-R; Wilkinson, 1993). Neurocognitive functions were assessed with the Brief Assessment of Cognition in Schizophrenia (BACS; Keefe et al., 2004). The composite score (calculated using z-scores of the 6 test domains) and the z-scores of Verbal Memory and Tower of London were used in data analyses, as verbal memory and

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