



# Does cognition predict community function only in schizophrenia?: A study of schizophrenia patients, bipolar affective disorder patients, and community control subjects

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## Abstract

Cognitive deficits predict functioning in schizophrenia; however, little is known as to whether the association is present in other mental disorders. If specific cognitive deficits uniquely predict functional impairment in schizophrenia the association of select aspects of brain dysfunction with daily living would suggest an intervention target and perhaps a means by which to improve the functioning of schizophrenia patients. The relationship of cognition and functioning was investigated in schizophrenia ( $n=39$ ), bipolar affective disorder ( $n=27$ ), and nonpsychiatric control ( $n=38$ ) participants to determine whether the associations varied across groups. We examined verbal memory, verbal learning, verbal fluency, vigilance, executive functioning, symptomatology, and generalized cognitive functioning for associations with social function. Correlational analyses revealed particular cognitive domains (e.g., verbal memory) to be associated with social functioning in schizophrenia, bipolar, and control subjects; however generalized cognitive function and symptomatology were also associated with social functioning in patients. Multiple regression analyses revealed that in schizophrenia poor verbal memory predicted worse social functioning even after the effects of generalized cognitive dysfunction were considered. Verbal memory indices failed to account for variance in social function in bipolar patients and control subjects after consideration of generalized cognitive function. Bipolar patients with worse planning and problem solving tended to have worse social functioning. Therefore, unlike schizophrenia patients who may fail to process verbally mediated material, bipolar patients' difficulty with logical approaches to problems in daily living may have the greatest impact on their community function.

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Amongst mental disorders schizophrenia results in arguably the most severe and chronic community dysfunction. Although many mental health profes-

nals previously assumed that impaired community function was due to psychotic symptoms of schizophrenia, a review of the literature suggested that cognitive deficits have an equal or greater role in predicting functional impairment of schizophrenia patients (Green, 1996). Subsequent studies indicate that both symptomatology and cognitive functioning appear to predict community function (Dickerson et al., 1996, 1999; Heslegrave et al., 1997; Kurtz et al., 2005; Norman et al., 1999; Sponheim et al., 2002). Despite renewed emphasis on community function investigations have rarely tested whether specific cognitive deficits predict functional impairment beyond impairment attributable to the general cognitive dysfunction (i.e., lower IQ) in schizophrenia, and whether associations between cognition and functioning are unique to schizophrenia among mental disorders. If specific cognitive deficits uniquely predict functional impairment in schizophrenia the association of select aspects of brain dysfunction with daily living would suggest an intervention target and perhaps a means by which to improve the functioning of schizophrenia patients. Alternatively, functional impairment of severe mental disorders that is generally predicted by overall cognitive dysfunction would fail to suggest a specific treatment target and would argue against specialized cognitive intervention to improve functioning in schizophrenia. In the present study we tested the relative contributions of generalized cognitive function, symptoms, and specific cognitive deficits in predicting community dysfunction in schizophrenia. We also studied a group of bipolar disorder patients and normal control subjects to determine if associations between specific cognitive indices and community functioning were unique to schizophrenia.

The influence of generalized cognitive dysfunction may in part explain why studies inconsistently identify predictors of functional impairment in schizophrenia. In a meta-analysis Green et al. (2000) estimated that general neurocognition accounts for 20–60% of the variance in community functioning in schizophrenia. They specifically noted that a general cognitive factor of learning potential might be most strongly associated with social functioning. Wiedl et al. (2001) also found that assessments that measure learning during a single session were able to predict outcomes of persons with schizophrenia more than static assessments. Green et al. (2000) and Woonings et al. (2003) indicated that

secondary memory measured through memory for lists of words or prose (i.e., “dynamic assessment”) may be an effective means by which to assess learning potential. Studies measuring secondary memory have found such indices to be related to functional outcome compared to measures that fail to have dynamic assessment properties tapping learning potential (Green et al., 2000). Green et al. (2000) also examined a set of interrelated cognitive variables in predicting social function and found that despite working memory, verbal comprehension and perceptual organization being correlated with one another and with full scale IQ, the cognitive domains did not predict functioning independent of one another thereby suggesting that only a generalized cognitive factor is important to community function. Sponheim et al. (2002) found that although generalized cognitive dysfunction and symptomatology were associated with functioning in schizophrenia, specific cognitive deficits such as verbal memory and fluency accounted for the most variance in functioning. Therefore, a critical distinction in determining cognitive predictors of functioning in schizophrenia is whether verbal memory indices predict community function because they measure learning potential or verbal memory predicts functioning independently of learning potential. In other words, two competing interpretations of studies to date are that 1) verbal memory indices serve as specific predictors of functional impairment in schizophrenia and 2) verbal memory indices best tap the generalized cognitive factor of “learning potential” and thus demonstrate associations with functioning. In the present study we include both “dynamic” and static indices of verbal memory to test which interpretation is supported.

Because bipolar affective disorder is a severe and typically chronic mental disorder with significant community dysfunction and some cognitive impairment it is a logical choice for testing the diagnostic specificity of predictors of community functioning. There have been mixed results as to whether bipolar disorder patients and schizophrenia patients differ with regard to their cognitive and social functioning. Although several studies have shown that the two groups do not differ on most measures of cognitive functioning (Addington and Addington, 1998; Dickerson et al., 2001; Goldberg, 1999; Hawkins et al., 1997; Park and Holzman, 1993), other studies have found patients with schizophrenia to show more

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