



Brief cognitive assessment instruments in schizophrenia and bipolar patients, and healthy control subjects: A comparison study between the Brief Cognitive Assessment Tool for Schizophrenia (B-CATS) and the Screen for Cognitive Impairment in Psychiatry (SCIP)

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ABSTRACT

Cognitive impairment in schizophrenia and psychosis is ubiquitous and acknowledged as a core feature of clinical expression, pathophysiology, and prediction of functioning. However, assessment of cognitive functioning is excessively time-consuming in routine practice, and brief cognitive instruments specific to psychosis would be of value. Two screening tools have recently been created to address this issue, i.e., the Brief Cognitive Assessment Tool for Schizophrenia (B-CATS) and the Screen for Cognitive Impairment in Psychiatry (SCIP). The aim of this research was to examine the comparative validity of these two brief instruments in relation to a global cognitive score. 161 patients with psychosis (96 patients diagnosed with schizophrenia and 65 patients diagnosed with bipolar disorder) and 76 healthy control subjects were tested with both instruments to examine their concurrent validity relative to a more comprehensive neuropsychological assessment battery. Scores from the B-CATS and the SCIP were highly correlated in the three diagnostic groups, and both scales showed good to excellent concurrent validity relative to a Global Cognitive Composite Score (GCCS) derived from the more comprehensive examination. The SCIP-S showed better predictive value of global cognitive impairment than the B-CATS. Partial and semi-partial correlations showed slightly higher percentages of both shared and unique variance between the SCIP-S and the GCCS than between the B-CATS and the GCCS. Brief instruments for assessing cognition in schizophrenia and bipolar disorders, such as the SCIP-S and B-CATS, seem to be reliable and promising tools for use in routine clinical practice.

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1. Introduction

Cognitive impairment in schizophrenia and bipolar disorder is ubiquitous and recognized as fundamental to both the pathophysiology of these disorders and the prediction of activities of daily living and community functioning (Green et al., 2004, 2005; Tabarés-Seisdedos et al., 2008). There is growing evidence that cognitive impairments are not only detectable before illness onset and stable over time but are also

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shared by first-degree relatives and heritable irrespective of psychopathological diagnosis. Therefore cognitive impairments are among the most promising candidate endophenotypes (Heinrichs and Zakzanis, 1998; Toulopoulou et al., 2007) either of psychosis or its premorbid stages, such as early or transitional phase of psychosis (Heinrichs and Zakzanis, 1998; Brewer et al., 2005).

Neuropsychological deficits are highly prevalent in schizophrenia and bipolar disorder (Daban et al., 2006; Krabbendam et al., 2005; Seidman et al., 2010) and other psychoses, such as schizoaffective disorder (Reichenberg et al., 2009). Although there is still considerable debate regarding the extent to which cognitive deficits and psychopathological symptoms are related, recent reviews and meta-analyses suggest that cognitive impairment and symptoms in schizophrenia are independent or semi-independent dimensions of the illness, since only small to medium significant statistical associations between negative and disorganization dimensions of psychosis and cognitive impairment have been found (Dominguez et al., 2009; Nieuwenstein et al., 2001; Ventura et al., 2000).

Until recently, schizophrenia patients were evaluated by means of extensive neuropsychological batteries specifically designed for neuropsychiatric disorders. There were few brief, valid, and reliable instruments for assessing cognitive functioning by non-trained clinicians in clinical practice. At present, there are specific neuropsychological batteries available for schizophrenia and other psychoses, such as the Cognistat (Kiernan et al., 1987), before 1995 known as the Neurobehavioral Cognitive Status Examination; the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) (Randolph et al., 1998); the Woodcock–Johnson III Test of Cognitive Abilities (Woodcock et al., 2001); and the Brief Assessment of Cognition in Schizophrenia (BACS) (Keefe et al., 2004; Segarra et al., 2010). Despite the fact that these instruments have excellent psychometric properties, their administration is quite time-consuming (more than 30 min), diminishing its utility in psychiatric practice. More abbreviated cognitive assessment instruments could offer an important screening tool for cognitive deficits in psychiatric illnesses, and potentially encourage the monitoring of change over time and treatment. This subject was addressed by clinicians working with dementia and other neuropsychiatric and neurological illnesses years ago with the introduction of standard brief measures, such as the Mini-Mental State Examination (Folstein et al., 1975), now widely used and well validated. In recent years, various brief screening tools have been devised to assess cognition in psychiatric samples with the intention of reducing administration time and bringing it into line with the demands of a typical clinical practice. Examples are the Brief Cognitive Assessment (BCA) (Velligan et al., 2004), the Screen for Cognitive Impairment in Psychiatry (SCIP) (Purdon, 2005); and the Brief Cognitive Assessment Tool for Schizophrenia (B-CATS) (Hurford et al., 2009). These all are simple and easy-to-administer instruments that require minimal additional equipment and have shown good

psychometric properties (Guilera et al., 2009; Hurford et al., 2009; Pino et al., 2008; Purdon, 2005; Rojo et al., 2010; Velligan et al., 2004). Until their advent, there were no such instruments designed for detecting cognitive deficits in psychiatric disorders in only 15 min per patient.

As shown in Table 1, both BCA and B-CATS are made up of elements from other tests (e.g., Trail Making Test), while the SCIP is an independent instrument. The BCA, B-CATS, and SCIP share the assessment of key domains of cognitive impairment in psychiatric illnesses. The SCIP and the BCA have subtests of processing speed and attention, verbal memory and learning, verbal fluency, and executive functioning and set-shifting. The B-CATS assesses all these cognitive domains with the exception of verbal memory and learning.

The development of brief instruments should include the study of their comparative validity to reliably summarize and concisely communicate information about a patient's overall level of cognitive functioning. Despite its unquestionable value, the BCA had not generated further studies after its initial publication, and its impact on clinical practice and specialized literature was low. However, both the CATS (and by extension its short version, the B-CATS) and the SCIP are two instruments that seem to be well accepted among clinicians and the scientific community, with a promising future. In this context, the aim of the current study was to examine for the first time the comparative validity of these brief cognitive screening instruments for schizophrenia and psychosis (SCIP-S and B-CATS) in relation to a global cognitive score derived from a more detailed assessment battery in patients with a schizophrenia spectrum disorder or type I bipolar disorder.

2. Methods

2.1. Sample description

Samples were extracted from two original studies, with detailed methods previously reported (Guilera et al., 2009; Pino et al., 2008). The sample reported here was composed of all subjects from either study who had complete data for all cognitive measures of interest, excluding two bipolar patients with highly unusual values (i.e., time to complete the TMT-B more than 6 min). The sample consisted of 237 participants, 96 patients with schizophrenia (86 schizophrenia, 9 schizoaffective disorders, and 1 schizophreniform disorder), 65 with type I bipolar disorder, and 76 healthy controls. All subjects provided informed written consent to participate and the studies were approved by the Ethics Committee of the University of Barcelona. Both patient groups were diagnosed according to DSM-IV criteria (American Psychiatric Association, 2000). The control group was interviewed with the Comprehensive Assessment of Symptoms and History (CASH) (Andreasen et al., 1992). The patients who had withdrawn from the previous studies, and were not included in the present analysis, did not differ with respect to socio-demographic

Table 1
Cognitive domains and neuropsychological tasks of BCA, B-CATS, and SCIP.

Cognitive domain	Neuropsychological tests	Brief cognitive instruments		
		BCA	B-CATS	SCIP
Motor and processing speed and attention	Trail making test – part A	X		
	Digit symbol coding (WAIS)		X	
	SCIP processing speed test			X
Verbal memory and learning	Hopkins verbal learning test	X		
	SCIP verbal learning test – immediate			X
	SCIP verbal learning test – delayed			X
Fluency	Letter fluency test	X		
	Category fluency test	X	X	
	SCIP letter fluency			X
Executive functioning and set-shifting	Trail making test – part B	X	X	
	SCIP working memory			X

BCA: Brief Cognitive Assessment; B-CATS: Brief Cognitive Assessment Tool for Schizophrenia; SCIP: Screen for Cognitive Impairment in Psychiatry.

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