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# Self-assessment of functional ability in schizophrenia: Milestone achievement and its relationship to accuracy of self-evaluation

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ABSTRACT

Between 50% and 80% of patients with schizophrenia do not believe they have any illness, and their self-assessment of cognitive impairments and functional abilities is also impaired compared to other information, including informant reports and scores on performance-based ability measures. The present article explores self-assessment accuracy in reference to real world functioning as measured by milestone achievement such as employment and independent living. Our sample included 195 people with schizophrenia examined with a performance-based assessment of neurocognitive abilities and functional capacity. We compared patient self-assessments across achievement of milestones, using patient performance on cognitive and functional capacity measures as a reference point. Performance on measures of functional capacity and cognition was better in people who had achieved employment and residential milestones. Patients with current employment and independence in residence rated themselves as more capable than those who were currently unemployed or not independent. However, individuals who had never had a job rated themselves at least as capable as those who had been previously employed. These data suggest that lifetime failure to achieve functional milestones is associated with overestimation of abilities. As many patients with schizophrenia never achieve milestones, their self-assessment may be overly optimistic as a result.



## 1. Introduction

Schizophrenia is an illness characterized by four domains of dysfunction: positive symptoms, negative symptoms, cognitive impairment, and affective symptoms. These four domains have been found to predict deficits in psychosocial and occupational functioning in schizophrenia (Bowie et al., 2006; Bowie et al., 2008). Studies have suggested that negative symptoms have a greater impact on real-world functioning than other symptoms (Rabinowitz et al., 2012) and that depression is associated with impairments in the performance of everyday functional skills independent from the influence of cognition and functional capacity (Sabbag et al., 2012). Patients with schizophrenia have been shown to lack awareness of impairments associated with illness in several areas, including symptoms (Amador et al., 1994), cognitive abilities (Medalia and Thysen, 2008), functional capacity (Sabbag et al., 2011), and everyday functioning (Bowie et al., 2007), largely through a tendency to underestimate the significance and severity of symptoms and to overestimate their functional abilities and current everyday functioning.

Poor insight is a core feature of schizophrenia and includes deficits in awareness of having a mental disorder, the need for treatment, understanding the consequences of the illness and the attribution of symptoms to the disorder. Between 50% and 80% of patients with schizophrenia do not believe they have any illness or impairments (Amador and Gorman, 1998). There are multiple strategies previously employed for assessing real-world functioning and its correlates, including rating scales completed by informants and patients (Leifker et al., 2011), direct observations by trained clinicians (Kleinman et al., 2009), and performance-based measures aimed at the ability to perform critical everyday skills (Harvey et al., 2007). Studies have shown that self-reports of cognition and everyday functioning in schizophrenia often do not converge with objective evidence, obtained both from performance-based assessments (Bowie et al., 2007; Keefe et al., 2006; Sabbag et al., 2012) or the reports of other evaluators (Keefe et al., 2006; McKibbin et al., 2004; Sabbag et al., 2011). Studies have shown that unawareness of cognitive deficits (Medalia and Thysen, 2008, 2010) is also common. In a recent investigation, Sabbag et al. (2011) found that the clinician ratings of the severity of real-world impairment were more strongly

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correlated with performance-based data relevant to outcomes than impairment ratings generated by friends, relatives, or the patients themselves, suggesting that the characteristics of the specific observer is important as well.

Impaired accuracy of self-assessment is not limited to persons with severe mental illness. The accuracy of self-assessment in both clinical populations and healthy individuals appears to be limited. Healthy individuals tend to consistently overestimate their abilities, with poor performers having a particularly positive bias (Dunning and Story, 1991; Ehrlinger et al., 2008). In contrast, otherwise healthy individuals with mild depressive symptoms tend to be more accurate in their self-assessments (Alloy and Abramson, 1979), with moderate to severe depression associated with underestimation of functioning (Bowie et al., 2007). Recently, Sabbag et al. (2012) found that higher levels of depressive symptoms within the moderate ranges in people with schizophrenia were associated with a lower tendency to overestimate everyday functioning. Clinical ratings of delusions, suspiciousness, grandiosity and poor rapport predicted overestimation of self-reported functioning compared to interviewer judgments. Such findings mirror those from studies of people with neurological and neuropsychiatric conditions, including bipolar disorder (Burdick et al., 2005), multiple sclerosis (Carone et al., 2005), and traumatic brain injury (Spikman and van der Naalt, 2010). Across all conditions, individuals with poorer neuropsychological (NP) test performance tend to underestimate their impairment.

Everyday functioning can be defined in several ways. The rating scales typically rate the level of success in performance of various skilled acts, such as cleaning, cooking, or financial management. Many of these rating scales do not have items that directly assess milestone achievements, such as marriage and financial responsibility for maintenance of a residence (Harvey et al., 2012). Milestone achievement can be defined across numerous domains. Living without supervision, being financially responsible, obtaining competitive employment, or having a stable relationship comparable to marriage signifies successful outcome. Such milestones have long been an integral part of clinical assessments and conceptions of recovery in severe mental illness (Harvey and Bellack, 2009), but have less often been systematically analyzed in the course of research on real-world functioning. In patients with schizophrenia, milestone achievement rates are typically low, particularly when achievement of more than one milestone is examined (Harvey et al., 2012). However, given the relative ease of validly measuring milestones (both their lifetime achievement and sustained maintenance) and their clear validity, when achieved, as indices of successful real world functioning, it is important to evaluate what distinguishes milestone achievers from their peers who do not achieve these milestones on a lifelong or current basis.

We have previously shown in the current sample (Harvey et al., 2011) and in previous studies with other samples (Bowie et al., 2008, 2010; Mausbach et al., 2007a, 2007b, 2011) that performance on neuropsychological tests and measures of functional capacity were correlated with both ratings on functional status rating scales and achievement of functional milestones in residential and vocational domains. These data suggest that indices of successful real-world functional outcomes, assessed with rating scales and indexed by achievement of milestones, have determinants in ability variables as well as environmental and social factors (Rosenheck et al., 2006).

The achievement of specific milestones may itself have the potential to affect accuracy of self-assessment, in that individuals who have had a job in the past or live independently have experience with the demands and challenges associated with achieving these goals (Bryson et al., 2002). Milestone achievers may have information that allows them to be more realistic with respect to self-assessment of their abilities. The current article expands our research on the accuracy of self-assessment in patients with schizophrenia to the association of self-assessment with milestone achievement, using data from the results of the VALERO study phase 1 (Leifker et al., 2011). In this study, the achievement of functional milestones in domains of residential functioning, social outcomes and productive activities was examined, with a goal of examining the association between achievement of milestones and of self-assessment of real-world everyday functioning. We compared patients who had and had not achieved functional milestones on their self-assessments of their everyday functioning on two different everyday functioning rating scales: the Specific Levels of Functioning (Schneider and Streuening, 1983) and the Quality of Life Scale (QLS; Heinrichs et al., 1983). Interviewer ratings on subscales were previously shown to be related to milestone achievement in specific functional domains (Harvey et al., 2012). We then used performance on neuropsychological tests and performance-based measures of functional capacity to further compare patients who had and had not achieved milestones, in order to provide an objective reference point for the self-reported levels of competence of the patients.

## 2. Methods

### 2.1. Subjects

Study participants were patients with schizophrenia who were receiving treatment at one of three different outpatient service delivery systems, two in Atlanta and one in San Diego. All research participants provided signed, informed consent, and this research study was approved by local IRBs. In Atlanta, patients were either recruited at an intensive psychiatric rehabilitation program (Skyland Trail) or from the general outpatient population of the Atlanta VA Medical Center. The San Diego patients were recruited from the UCSD Outpatient Psychiatric Services clinic, which is a large public mental health clinic, from other local community clinics, and by word of mouth.

All patients with schizophrenia were administered either the Structured Clinical Interview for the DSM-IV (SCID; First et al., 1995: Atlanta sites) or the MINI International Neuropsychiatric Interview (MINI; Sheehan et al., 1998: San Diego) by a trained interviewer. All diagnoses were subjected to a consensus procedure at the local site. Patients were excluded for a history of traumatic brain injury with unconsciousness $>10$ min, brain disease such as seizure disorder or neurodegenerative condition, or the presence of another DSM-IV-TR diagnosis that would exclude the diagnosis of schizophrenia. None of the patients were experiencing their first psychotic episode. Substance abuse was not an exclusion criterion, in order to capture a broad array of patients, but patients who appeared intoxicated were rescheduled. Inpatients were not recruited, but patients resided in a wide array of unsupported, supported, or supervised residential locations. Descriptive information on patients has been previously presented and is contained in online supplemental material (see supplemental Table 1).

### 2.2. Procedure

All patients were examined with a performance-based assessment of neurocognitive abilities and functional capacity which has been reported on previously (Harvey et al., 2011). They also provided self-reports of social, residential, and vocational functioning on six different functional outcome scales, which were either administered to them as interviews by a trained rater or completed in a questionnaire format, depending on the instructions of the scales. Patients received $50.00 for their time and effort.

#### 2.2.1. Real-world functional outcomes

The initial phase of the VALERO study included a RAND panel that selected six functional outcome scales from a much larger group of candidate scales, as most suitable for current use at the time of the panel (see Leifker et al., 2011, for detailed descriptions of these instruments). Two of these scales, the QLS and the SLOF, had subscales directly targeted at the domains of functioning in which we were interested: vocational, social, and everyday living skills; they are the focus of this report. These instruments were modified by deletion of some of their subscales following the suggestions of the RAND panel. The social acceptability and personal