



# Comparison of performance-based assessment and real world skill in people with serious mental illness: Ecological validity of the Test of Grocery Shopping Skills

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## ABSTRACT

Valid functional measures are essential for clinical and research efforts that address recovery and community functioning in people with serious mental illness. Although there is a great deal of interest in functional assessment, there is limited research supporting how well current evaluation methods provide a true assessment of real world functioning or naturalistic behavior. To address this gap in the literature, the present study examined the performance of individuals with serious mental illness (i.e., diagnosis of schizophrenia-spectrum, bipolar disorder, or other depression/anxiety diagnoses and accompanying functional disability) on the Test of Grocery Shopping Skills (TOGSS), a performance-based naturalistic task. We compared TOGSS performance to two dimensions of real world functioning: directly observed real world grocery shopping and ratings of community functioning. Results indicated that the TOGSS was significantly associated with real life grocery shopping, in terms of both shopping accuracy ( $r = 0.424$ ) and time ( $r = 0.491$ ). Further, self-report and observer-rated methods of assessing real world shopping behaviors were significantly correlated ( $r = 0.455$ ). To our knowledge, this is one of the first studies to directly compare a *performance-based* naturalistic skill assessment with carefully observed *real world* performance of that skill in people with serious mental illness. These findings support the feasibility and ecological validity of performance-based naturalistic assessment with the TOGSS.

## 1. Introduction

Recovery from serious mental illness (SMI) often incorporates the goal of living more independently in the community. Toward this goal, treatment and rehabilitation programs often focus on skills training interventions that help individuals enhance their capacity to successfully accomplish a task or goal related to community functioning (Lyman et al., 2014). Thus, valid functional measures are essential for effective clinical and research efforts that address recovery and community functioning (Bromley and Brekke, 2010).

Methods of functional outcome assessment vary from self-report, informant report, and performance-based measures, and each have associated strengths and weaknesses (Bellack et al., 2006; Harvey et al., 2007). Rating scales based on self- or informant reports are easy to administer, however, they can be unreliable (Atkinson et al., 1997; Bowie et al., 2007). Valid self-reports are dependent on factors such as an individual's insight and self-awareness. Informant reports are problematic because informants (e.g., clinicians or family members) vary in their familiarity with a person's functional abilities or community experiences. Thus, self- or informant-rating scales may be limited in

terms of reliability and validity. Performance-based skill assessments have been utilized in SMI research in recent years as an effort to provide more direct and objective skill measurement. Although performance-based assessments have the advantage of directly observing behavioral skill performance, ecological assessment in the real world can be difficult to implement (Greenwood et al., 2016; McKibbin et al., 2004). For this reason, performance-based assessment is often conducted within clinic or laboratory settings to standardize and optimize the testing environment. Skill assessment under simulated, controlled conditions is thought to capture the construct of *functional capacity* (Green et al., 2015). In SMI research, the most commonly used measure of functional capacity in recent years has been the UCSD Performance-Based Skills Assessment (UPSA; Patterson et al., 2001), which has been associated with outcomes such as independent living status (Mausbach et al., 2008) and observer-rated level of functioning (Bowie et al., 2007; Holshausen et al., 2014). Research has established a relationship between functional capacity and various real world outcomes (Bowie et al., 2006; Cardenas et al., 2012; Greenwood et al., 2016), although there is a distinction between what one can do under simulated conditions (i.e., functional capacity) and real world functioning,

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which relates to what a person actually does under real life circumstances (Bowie et al., 2006). Additionally, research is mixed in terms of how well functional capacity measures predict community functioning (Green et al., 2015).

*Performance-based naturalistic tasks* (Robertson and Schmitter-Edgecombe, 2017) conducted in real world contexts may provide a better indication of real world functioning than laboratory-based performance measures for a variety of clinical populations (e.g., Chaytor and Schmitter-Edgecombe, 2003; Chevignard et al., 2008; Robertson and Schmitter-Edgecombe, 2017; Zayat et al., 2011). The Test of Grocery Shopping Skills (TOGSS; Hamera and Brown, 2000; Brown et al., 2009) was developed as a naturalistic task to assess functional skill performance within a real world environment of a grocery store. In this regard, the TOGSS is intended to provide a closer approximation of real world skill performance than would a skill assessment conducted in a simulated environment. For instance, the TOGSS requires test-takers to shop for a list of ten common grocery store items, and reflects many aspects of real world shopping, such as the behavioral, social and cognitive sequences of the task. In addition, because testing is situated in the real world, it encompasses real life challenges (e.g., distractions) and supports (e.g., cues, signs, etc). On the other hand, as a formal assessment method, some aspects of the TOGSS are necessarily simulated and standardized, such as the provision of a standardized list of items and task instructions.

Thus, while various methods are available to assess functional skill performance, research is limited regarding how well the current methods provide a true assessment of real world functioning or naturalistic behavior (Bromley and Brekke, 2010). The best assessment of a person's real life functioning is to observe naturalistic behaviors in real world settings (Bromley et al., 2012a; McKibbin et al., 2004; Mclaughlin et al., 2016) and researchers in serious mental illness have begun to develop careful methods for naturalistic observation in real life (e.g., Gioia, 2009; Bromley et al., 2012b). For instance, Bromley et al., (2012b) developed a video observation method for measuring everyday functioning, which they found to be associated with neurocognitive test performance. Careful, naturalistic observation may not be feasible in some clinic or research situations. Nonetheless, direct observation of real world behavior can be an important method to validate existing functional assessment measures, which generally rely on simulated conditions (Bellack et al., 2006). Research is currently lacking comparing simulated and in-vivo performance of functional skills in persons with schizophrenia and other SMIs (Bromley and Brekke, 2010). Using a standardized cooking task, Duncombe (2004) reported significantly higher scores in skill performance when individuals were tested in their home versus a clinic setting. While this study examined task performance in two different contexts, it did not compare standardized cooking performance to naturalistic, real-life cooking behaviors. Thus, the current study addresses a significant gap in the functional outcome literature by comparing performance on a standardized functional assessment (i.e., TOGSS) with direct observation of real world behavior. In this regard, the current study was intended to address the ecological validity of the Test of Grocery Shopping Skills.

The overall study aim was to compare the task of grocery shopping measured with a standardized, *performance-based naturalistic task* (TOGSS) to various dimensions of real world functioning among persons with SMI. Toward that aim, we examined two dimensions of real world functioning: 1) real world grocery shopping performance and 2) ratings of community functioning. It was hypothesized that the TOGSS would be significantly associated with directly observed real world grocery shopping and, to a lesser extent, with ratings of community functioning.

## 2. Method

### 2.1. Participants

Fifty-nine participants with serious mental illness (67% female; mean age = 43.19 years,  $SD = 9.72$ ) completed the present study. Participants identified themselves as White/Caucasian ( $N = 43$ ; 74%), African-American ( $N = 7$ ; 12%), American Indian or Alaskan Native ( $N = 4$ ; 6.9%), Hispanic ( $N = 1$ ; 1.7%), and multiracial or other racial/ethnic identity ( $N = 4$ ; 6.8%). All participants were stable outpatients participating in community-based mental health services that required the participants met local state/federal criteria for SMI (i.e., all participants had a diagnosis of a major mental disorder and accompanying functional disability). The Structured Clinical Interview for DSM-IV (First et al., 2002) was utilized for diagnostic confirmation in the majority of cases ( $n = 46$ ). In the absence of SCID data, the participant's clinical diagnosis is reported ( $n = 13$ ). Participant diagnoses included: schizophrenia or schizoaffective disorder ( $n = 21$ ; 35.6%), bipolar disorder ( $n = 15$ ; 25.4%), and other depressive and/or anxiety disorders ( $n = 23$ ; 39.0%). Exclusionary criteria included substance abuse/dependence in the past 30 days, sensory or physical impairments interfering with task performance, developmental disability, and known neurological disease. The study was approved by the relevant institutional review board and all participants provided written informed consent. The following functional measures were conducted in separate testing sessions, which were scheduled as closely in time as possible with participants. The mean length of time needed to complete all testing was 10 weeks.

### 2.2. Measures

#### 2.2.1. Performance-based naturalistic grocery shopping

The Test of Grocery Shopping Skills (TOGSS) is a functional skill performance measure that evaluates grocery shopping skills in a naturalistic context of a grocery store. The task requires participants to shop for 10 common grocery items from a list provided to them and was administered in a grocery store unfamiliar to the participant. Previous studies show that the TOGSS has demonstrated adequate stability (test-retest) and equivalence (alternate form) reliability coefficients ranging from 0.64 to 0.83, and inter-rater reliability ranging from 99 to 100% (Brown et al., 2009; Hamera and Brown, 2000). In terms of validity, the TOGSS has demonstrated expected relationships with cognition and shopping knowledge (e.g., Brown et al., 2006; Racette et al., 2016; Rempfer et al., 2003; Rempfer et al., 2017). The present study examined two TOGSS outcome scores: task accuracy and time. Accuracy is a measure of the number of items obtained that were the correct item, correct size, and lowest price for the ten items, for a maximum possible total score of 30. Time is a measure of total minutes and seconds taken to compete the shopping task.

#### 2.2.2. Real world measurement of grocery shopping skills

In order to assess real world functioning with regard to grocery shopping skills participants were directly observed during the course of one of their own grocery shopping trips (Real World Shopping; RWS). In order for the activity to remain as naturalistic as possible, participants were scheduled for assessment at a time determined by their own schedule and were instructed to shop as they normally do in their usual grocery store. Participants were asked to schedule testing at a time that they anticipated shopping for at least 10 items, although ultimately the majority of participants (65%) did not acquire at least 10 items at the time of testing. In order to maximize the real world authenticity of this task, participants were not given other specific guidelines or instructions for their shopping. Thus, participants were allowed to purchase any type or number of items they wished. RWS measurement yielded variables for three dimensions of performance: *observation*, *self-report*, and *time*, as described below. In order to identify important aspects of

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