



Supported employment among veterans with serious mental illness: the role of cognition and social cognition on work outcome



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ABSTRACT

Unemployment is a primary functional deficit for the majority of adults with schizophrenia. Research indicates that over two-thirds of adults living in the community with schizophrenia are unemployed. Despite effective programs to assist with job identification and placement, the ability to attain and maintain employment remains a pressing concern. Neurocognitive functioning is widely acknowledged to be a determinant of work outcome; however, effect sizes tend to be in the small to medium range. The present study sought to further understand the determinants of work outcome among a sample of 104 veterans with schizophrenia enrolled in a supported employment program. A small percentage of veterans in the study got competitive jobs; 53% who secured jobs maintained employment for longer than 6 months. Cognition, social cognition, and symptoms were unrelated to job attainment. However, speed of processing and social cognition were significant predictors of work outcomes such as wages and tenure. These findings suggest that cognitive abilities including processing speed and the ability to accurately interpret and respond to social cues are significant determinants of whether individuals with schizophrenia remain employed. The results are discussed in light of current available treatment options and domains to target in synergy with work rehabilitation efforts.

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1. Introduction

Work is identified as a primary component of rehabilitation and recovery for many individuals with schizophrenia and serious mental illness (SMI) (Dunn et al., 2008; Provencher et al., 2002). However, the vast majority of adults with SMI are unemployed with estimates ranging from 70% to 90% (Burns et al., 2009; Rosenheck et al., 2006). Although the rates of competitive employment are low, interventions for job placement and support are associated with gains in attaining and maintaining employment. There are a host of factors that influence work outcomes, of which cognitive ability is frequently identified. Neurocognitive deficits, such as executive functioning, attention, learning and memory, and processing speed correlate closely with vocational rehabilitation and competitive employment outcomes (Bryson and Bell, 2003; Evans et al., 2004; McGurk and Meltzer, 2000; McGurk and Mueser, 2006; McGurk et al., 2007). More recently, social cognition has also been identified as having a close link with work outcome (Bell et al., 2009; Fett et al., 2011; Horan et al., 2011). The current study examined the role of neurocognition and social cognition on work outcome within the context of Supported Employment.

Established in the mid-1990s, a leading evidence-based model of Supported Employment, Individual Placement and Support (IPS; Becker

and Drake, 2003), is based on the following principles: a) eligibility based on client choice (i.e. zero exclusion criteria), b) emphasis on good job match based on interest and skill level, c) including work rehabilitation as an integral component of mental health treatment, d) competitive employment as the primary goal, e) rapid job search, f) attention to consumer preferences, g) systematic job development, and h) continuous individualized follow-along support (Bond et al., 2012). IPS is consistently supported in favor of traditional vocational rehabilitation for job attainment (Burns et al., 2007; Crowther et al., 2001; Twamley et al., 2003). A meta-analysis of four high-fidelity IPS randomized controlled trials (RCTs) with a total of 681 participants followed for 18-months found a 70.4% job acquisition rate in the IPS conditions, compared to 24.3% in the well-established vocational programs (Campbell et al., 2011). The findings concerning job maintenance have been more mixed. A large review of high-fidelity programs published in 11 studies concluded that while 61% of IPS participants obtained work (compared to 23% of controls), average tenure for first job was 24 weeks, out of a 52-week follow-up (Bond et al., 2008). In the Campbell et al. meta-analysis, total mean number of weeks worked in any competitive employment position within the 18-month follow-up period was 20.5 weeks for the 307 IPS participants, and longest tenure in one job was 17.4 weeks. On the other hand, in a summary of seven IPS RCTs, the total mean hours worked during an 18-month follow-up was three times greater for IPS participants than for controls (Bond et al., 2012), and a separate 24-month study that included 80 prospective and 60 retrospective (already employed) participants with SMI in high-fidelity IPS programs reported an average of 12.86 months worked (Bond and Kukla, 2011).

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While neurocognition is widely acknowledged as a key determinant of functional outcome in schizophrenia, and to be related to work outcome in particular, its role within the context of IPS Supported Employment is largely unknown. To date, there are no published studies on the role of social cognition in IPS work outcomes. The few studies that have directly examined the impact of cognition on IPS outcomes have yielded conflicting results. One study reported no discernible cognitive predictors of work outcome (Campbell et al., 2011), while another reported a significant relationship between cognition and job tenure, but not attainment (Gold et al., 2002).

The current study examined the role of neurocognition and social cognition in job placement and tenure in a sample of SMI veterans enrolled in a VA IPS program. Cognitive functioning and symptoms were assessed at baseline, and employment outcomes were assessed for up to one year. The study had two aims: a) to examine the role of neurocognition and social cognition in work attainment, and b) to examine the relationship of neurocognition and social cognition with work outcome (i.e. weeks worked, hours worked, and wages). Given the IPS emphasis on optimal job matching based on client preference and skill, we expected there to be little relationship between cognition and job attainment. The more varied outcomes that have been reported in job tenure may be explained by variability in cognitive functioning that IPS programs cannot directly address. Hence, we predicted cognition and social cognition to play a stronger role in work outcome.

2. Methods

2.1. Subjects

The sample included 104 veterans (95 men, 9 women) with SMI. Participants were recruited for the study from the Veteran's Competitive Employment Development program (VCED) at the Greater Los Angeles VA Healthcare Center. The program implemented the IPS model of Supported Employment. The veterans were clinically stable outpatients (no psychiatric hospitalizations in the past three months and no medication changes in the past two months); antipsychotic medication type and dose were maintained by the veterans' treating physicians. All participants were a minimum of 21 years of age and expressed an interest in working. The study was approved by the UCLA Institutional Review Board, and all participants provided written informed consent to participate in the study.

Following enrollment in the Supported Employment program and informed consent for the research, veterans received a baseline clinical and neurocognitive assessment. Veterans then worked with their respective employment specialist with the aim of attaining a community-based job, and were followed by study personnel until they obtained a job or were discharged from the VCED program by decision of the VCED team. Veterans who got competitive jobs were followed for 12 months after initial job start date. Fidelity was assessed annually using the Supported Employment Fidelity Scale.

2.2. Measures

2.2.1. Cognition

The MATRICS Consensus Cognitive Battery (MCCB; Nuechterlein and Green, 2006) was used to assess neurocognition and social cognition. The MCCB provides normed scores and includes tests that assess seven domains including speed of processing, attention/vigilance, working memory, verbal learning, visual learning, reasoning and problem solving, and social cognition (Kern et al., 2008; Nuechterlein et al., 2008). T-scores from the seven domains, as well as the composite score derived from the average of T-scores minus social cognition, served as indices of neurocognitive function. The social cognition T-score served as the index of social cognition.

2.2.2. Clinical symptoms

Psychiatric symptoms were assessed using the expanded 24-item version of the Brief Psychiatric Rating Scale (BPRS; Ventura et al., 1993). All interviewers were trained to a minimum intra-class correlation coefficient of .80 by the MIRECC Treatment Unit. Positive, negative, and total symptom scores served as indicators of clinical symptom severity.

2.2.3. Employment status and work outcome

Employment status was measured as a dichotomous variable defined as attaining employment at any point during the course of participation in the study. For those who got jobs, hours worked, weeks worked, and dollars earned were used as continuous dependent variables to indicate tenure.

2.3. Statistical analyses

Initially, we performed descriptive statistics (Table 1) and compared workers and non-workers in terms of demographics, symptoms, and cognition. We modeled our primary analyses to be consistent with previous studies of work rehabilitation outcome. Because of the non-normal distribution of work outcome measures, we used nonparametric methods to confirm the results obtained from the parametric analyses.

For each of the analyses, our primary focus was on cognition. First, we used logistic regression to examine cognitive predictors of job attainment. The next aim was to examine cognitive predictors of job tenure and earnings. We did this in two ways: a) parametric correlations using Pearson's *r* and b) nonparametric correlations using Spearman's ρ . Pearson's correlations allow for detection of associations between participants who are outliers in terms of both work tenure and cognition, while Spearman's correlations allow for detection of significant associations aside from those attributable to irregularities in distribution. To further examine work outcomes, we included only participants that obtained work and conducted linear regression analyses with hours worked, weeks worked, and wages earned as the dependent variables.

Table 1
Sample demographics and clinical characteristics (N = 70).

Demographics	N (%)
Gender Male	63 (90%)
Race	
White	19 (27%)
African American	37 (53%)
Other	14 (20%)
Diagnosis	
Schizophrenia	33 (44%)
Schizoaffective	15 (20%)
Other*	26 (35%)
	M (SD)
Age	49.9 (9.6)
Education	13.4 (2.1)
Parental Education	12.2 (3.1)
Illness chronicity (years)	20.7 (11.6)
Symptoms	
BPRS Positive	6.3 (3.5)
BPRS Negative	5.5 (2.3)
BPRS Total	41.1 (8.6)
MCCB	
Processing Speed	35.6 (13.0)
Attention/vigilance	38.5 (12.8)
Working memory	38.2 (12.0)
Verbal learning	41.9 (9.7)
Visual learning	41.8 (12.0)
Reasoning problem solving	42.4 (9.1)
Social cognition	39.6 (11.8)
Overall composite	33.1 (13.5)

* Other diagnoses: e.g., Psychosis NOS; major depressive disorder with psychotic features; bipolar disorder.

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