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The role of experiential and expressive negative symptoms on job obtainment and work outcome in individuals with schizophrenia

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ABSTRACT

Unemployment rates for schizophrenia are high across all age groups compared to the general population. Past studies have focused on neurocognition as a key determinant of unemployment and poor work outcome in schizophrenia. However, several recent studies suggest that clinical symptoms may be equally or more important than cognitive dysfunction for understanding employment difficulties. An enhanced understanding of the domains of negative symptoms that hinder job obtainment and work outcomes in people with schizophrenia is vital for developing treatments that translate into better employment outcomes. The purpose of this study was to determine whether 112 participants with schizophrenia or schizoaffective disorder receiving supported employment services differed on experiential and expressive negative symptoms based on whether they obtained a job or remained unemployed. Further, in a subset of workers, this study examined the relationship of experiential "motivational" negative symptoms with work outcomes (weeks worked, hours worked, wages earned). Neurocognition was assessed using the MATRICS Consensus Cognitive Battery and clinical symptoms were assessed using the Scale for the Assessment of Negative Symptoms and the Brief Psychiatric Rating Scale. Experiential, but not expressive, negative symptoms were related to job obtainment, hours worked, and wages earned. However, these findings were attenuated and non-significant after controlling for age. These results suggest that experiential negative symptoms are potentially key to better understanding employment outcomes of individuals with schizophrenia receiving supported employment services, but further work is needed to untangle its significance vis-à-vis other individual, environmental, and program factors.

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1. Introduction

Unemployment rates for the schizophrenia (SCZ) population are high (about 90%) across all age groups compared to the general population (Evensen et al. 2016). A number of studies have sought to identify determinants of unemployment and poor work outcome in SCZ. Past studies and meta-analyses examining predictors of work outcome have largely focused on neurocognition and clinical symptoms (Kaneda et al. 2009; McGurk and Mueser 2003, 2006; Nuechterlein et al. 2011; Tsang et al. 2010) with several recent studies suggesting that clinical symptoms may be equally or more important than cognitive dysfunction with regard to work functioning. Review papers (Anthony and Jansen 1984; Christensen 2007; Tsang et al. 2010), as well as recent studies (Fervaha et al. 2015; Rocca et al. 2014), have shown that positive symptoms are modestly, or not at all, related to work functioning and/or unemployment; however, over 25 studies have shown that negative

symptoms are strongly associated with work functioning and/or job obtainment.

Negative symptoms include diminished emotional experience (anhedonia), decreased motivation (avolition), and expressive or communicative impairments (e.g., diminished facial expressivity, gestures, prosody, and speech production) (Blanchard et al. 2011; Kirkpatrick et al. 2006). Most studies have examined negative symptoms as a singular construct in the context of vocational functioning and job obtainment. More recently, studies have divided negative symptoms into two subdomains (experiential and expressive) to more precisely understand their effect on functional outcome in SCZ (Kring et al. 2013; Schlosser et al. 2015; Strauss et al. 2012). The experiential negative symptom factor encompasses avolition (decreased motivation), anhedonia (decreased experience of pleasure) and asociality (decreased value for social contact). The expressive factor, on the other hand, captures decreased emotional expressivity and alogia (poverty of speech). In SCZ, experiential symptoms more robustly predict functional outcome, as measured by performance-based measures of functional capacity, real-life functioning, and self-report measures of functional attainment, than expressive deficits (Galderisi et al. 2014; Green et al. 2012; Rassovsky et al. 2011; Ventura et al. 2015). No studies to our

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knowledge have examined the relationship of subcategories of negative symptoms with job obtainment and work outcomes within the context of supported employment.

Supported employment programs are evidence-based work rehabilitation programs that provide support for people with severe mental illness, and they are effective for improving competitive work outcomes (Mueser et al. 2016). Studies have pointed out several client factors that predict job obtainment and work outcomes within supported employment programs, such as recent work history, fewer years of disability support, Hispanic ethnicity, and fewer physical health problems (Campbell et al. 2010; Metcalfe et al. 2016). Further, cognitive functioning and clinical symptoms may be differentially linked to work outcomes and job obtainment in supported employment. Specifically, studies have found that neurocognition, social cognition, and clinical symptoms are unrelated to job obtainment (Reddy and Kern 2014), but cognitive functioning (McGurk and Meltzer 2000; McGurk and Mueser 2006; McGurk et al. 2003; Reddy and Kern 2014) and social cognition (Reddy and Kern 2014) significantly predict job tenure and wages earned. In terms of clinical symptoms, some studies show that positive and negative symptoms are related to supported employment outcomes (Burns et al. 2009; Cook et al. 2008; McGurk et al. 2003; Rosenheck et al. 2006; Slade and Salkever 2001; Suslow et al. 2000), but others report no relationship (Bond et al. 1995; Drake et al. 1999; Drake et al. 1996; McGurk and Mueser 2006; Reddy and Kern 2014).

This study was designed to examine whether participants' job obtainment status (workers vs. non-workers) differed on experiential and expressive negative symptoms, and to explore whether experiential and expressive negative symptoms were differentially related to work outcomes (weeks worked, hours worked, wages earned) in a sample of individuals with SCZ receiving supported employment services. We predicted a more significant role for experiential negative symptoms because of its prominent role in predicting functional outcome compared to expressive negative symptoms. We also predicted level of neurocognition to be associated with work outcome.

2. Methods

2.1. Participants

This study included 112 participants (44 workers and 68 non-workers) who met SCID-based DSM-IV (First et al. 1996) criteria for SCZ or schizoaffective disorder, and were enrolled in supported employment programs at the VA Greater Los Angeles Healthcare System or a community-based mental health center. Psychiatric diagnosis was determined after administration of the Structured Clinical Interview for DSM-IV Axis I Disorders Patient Edition (SCID-I/P) (First et al. 1996) by an interviewer trained to use the SCID-I/P by the Diagnosis and Psychopathology Unit of the University of California, Los Angeles, Clinical Research Center for the Study of SCZ. A minimum kappa of 0.75 for rating the presence of psychotic and mood items was required of all interviewers trained in the program. At the point of study entry, subjects were clinically stable outpatients who had no psychiatric hospitalizations in the past 6 months and had been maintained on the same antipsychotic medication for the past four weeks. All participants were a minimum of 18 years of age and expressed an interest in working. Exclusion criteria included evidence of current or past neurological disorder (e.g., epilepsy), history of head trauma with loss of consciousness exceeding 1 h, and alcohol or substance dependence within the past three months. Data were collected from 2007 to 2014, and all participants signed informed consent for participation in the study.

Following enrollment into the supported employment program, participants completed an assessment battery including clinical symptoms and neurocognition. Trained raters administered cognition and clinical symptom measures, and raters were trained to a minimum intraclass correlation coefficient of 0.80. Inter-rater reliability was

established prior to the enrollment of participants, with reliability checks routinely conducted throughout the study.

Participants worked with their respective employment specialist with the aim of obtaining a community-based job. Work outcome data (i.e., wages earned, hours worked, and weeks worked) were aggregated over a one-year period following job obtainment.

As part of a larger study, 17 participants were randomly assigned to a cognitive remediation training intervention after obtaining a job. These participants were not included in work outcome analyses examining wages earned, hours worked, and weeks worked, but were included in the analyses on job obtainment.

2.2. Measures

2.2.1. Neurocognition

The MATRICS Consensus Cognitive Battery (MCCB; Nuechterlein and Green 2006) was used to assess cognition. It includes tests that assess seven domains of neurocognition including speed of processing, attention/vigilance, working memory, verbal learning, visual learning, reasoning and problem solving, and social cognition. To obtain a purer measure of neurocognition, we used a modified neurocognitive composite score that did not include the social cognition domain that was based on the average T-scores from the six remaining domains. The age- and gender-corrected overall composite T-score served as the index of cognitive function (Kern et al. 2008; Nuechterlein et al. 2008). Higher scores indicate better performance. All MCCB raters were trained to certification standards.

2.2.2. Symptoms

The Scale for the Assessment of Negative Symptoms (SANS; Andreasen 1984) was administered to assess two negative symptom domains: (1) expressive symptoms, which consist of affective flattening (blunted affect) and alogia; and (2) experiential symptoms, which consist of avolition/apathy and asociality/anhedonia. The attention subscale was not included in these analyses due to the overlap with the measurement of cognitive functioning (Andreasen et al. 2005).

Positive symptoms were evaluated using the Expanded Brief Psychiatric Rating Scale (BPRS; Ventura et al. 1993b).

All SANS and BPRS interviewers were trained to a minimum intraclass correlation coefficient of 0.80 using established procedures (Ventura et al. 1993a; Ventura et al. 1998) by the Treatment Unit of the VISN 22 Mental Illness Research, Education and Clinical Centers (MIRECC) and participated in an on-going quality assurance program. Higher ratings on the BPRS and SANS indicate more severe levels of symptoms.

2.2.3. Job obtainment and work outcome

Group membership (workers vs. non-workers) was based on job obtainment. Workers were any participants who obtained competitive employment through their supported employment program; non-workers were participants who did not obtain any employment over a 12-month period within their supported employment program or who were dropped from the program prior to the 12-month timeframe (e.g., failure to maintain contact with the program; expressed change in interest in working). Work outcomes were aggregated over a 12-month follow-up period from the point of the initial job start date and included measurement of weeks worked, hours worked, and wages (dollars) earned.

2.3. Statistical analyses

Analyses were performed using IBM SPSS version 22 software. Distributions and skewness analyses of variables indicated that some of the work outcome variables (i.e. hours and wages) and parental education were non-normally distributed, and log transformations were used for analyses with these variables. Group differences (workers vs.

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