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Lifetime employment in schizophrenia: correlates of developing long term unemployment after being employed before

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ABSTRACT

Background: Challenges in employment are highly prevalent among people with schizophrenia regardless of their employment history. Although supportive employment can be effective, few participants sustain meaningful competitive employment. Our goal was to identify the correlates of developing sustained unemployment.

Methods: We examined employment outcomes by comparing clinical, neurocognitive, and social cognitive features in 234 participants with Schizophrenia Spectrum Disorders across t competitive employment outcomes: currently employed, participants who had never worked for a year, and those who had been employed but developed long-term unemployment. We examined social cognition and neurocognition, as well as positive and negative schizophrenia symptoms, and premorbid functioning and demographic factors.

Results: We found significant differences in age, race, premorbid functioning, cognitive performance, and social cognition between currently and formerly employed patients. When individual tasks were examined, emotion recognition and verbal working memory performance were the domains differentiating the groups. Older African Americans were over-represented in the formerly employed group.

Conclusions: There were minimal differences other than age and race between formerly employed patients and those who had never worked. These data suggest the possibility that deterioration in employment outcomes may also co-occur with declines in other abilities. Opportunities and disparities may also be a contributor to re-entering the work force.

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Introduction

Employment is a serious challenge for people with severe mental illness. At any given time, as few as 10% of people with schizophrenia are employed on a competitive basis (Marwaha et al., 2007), with some studies suggesting that as many as half of all people with schizophrenia never work at a competitive job for a sustained period (McGurk et al., 2003). Employment challenges span the full range of elements in the labour market, including obtaining employment (Becker & Drake, 2003) and sustaining work after obtaining a job (Becker et al., 1998). Multiple interventions, including supported employment, both alone (Bond et al., 2008) and augmented with cognitive training (Wexler & Bell, 2005), have been deployed to increase vocational success in people with schizophrenia. It seems likely that different factors affect obtaining and sustaining employment in this population, with motivation (McGurk & Mueser, 2004), cognition (McGurk & Meltzer, 2000), social cognition (Brekke et al., 2005), and interpersonal and interviewing skills (Bell & Weinstein, 2011) seeming to have important roles.

Competitive employment may be increasingly difficult to attain over time with the aggregated effects of little prior work experience, lower education levels, and neurocognitive impairment (Macbeth & Gumley, 2008; Tsang et al., 2010). Chronically unemployed people with schizophrenia are reported to exhibit poor premorbid functioning, as well as increased negative symptoms and cognitive dysfunction (Llerena et al., 2018; McGurk & Meltzer, 2000; Reddy & Kern, 2014). As a result, people that have never had an extended period of competitive employment may continue to have difficulties finding employment and have worse lifetime work outcomes (Mahmood et al., 2019).

After the difficulties of obtaining competitive employment, sustaining employment has proven challenging as well. Positive symptoms, for instance, are correlated with the need for more services, and patients must be able to sustain treatment for these symptoms (Suslow et al., 2000). Further, social cognition seems to play a role in how well individuals with schizophrenia can perform their jobs. Problems with social cognition can lead individuals to experience discomfort in social situations, have greater difficulty understanding and communicating with their coworkers, possibly leading to interpersonal challenges and reduced responsibilities and hours worked (Reddy & Kern, 2014).

Although it is controversial if global cognitive and functional decline throughout the lifespan is observed (Fett et al., 2019), there is some evidence supporting the social drift hypothesis, which suggests a continued progression of illness leading to reductions in social functioning (Kotov et al., 2017). We previously reported evidence for vocational drift (Vargas et al., 2014), finding that some participants demonstrated a pattern of downward drift in their employment status. Patients who sustained employment were successively employed at less cognitively demanding jobs, worked fewer hours per week, and had lower-status jobs, compared to their history of higher-status occupations. One of the major predictors of vocational drift was evidence of early educational underachievement, indexed by participants obtaining less education than their mothers. Other participants appeared to never return to work after a job loss, which is consistent with the results of other studies (Metcalf et al., 2018).

In this study, we examine competitive employment outcomes in a reasonably large sample of people with schizophrenia. In this sample, we compared people with schizophrenia across three employment outcomes: those who never sustained full or part time

competitive employment for a one-year period, another sample of patients that were formerly employed for at least 2 years before developing chronic long-term unemployment for a period of 2 or more years, and a final group of currently employed patients. We compared them on positive and negative clinical symptoms, cognitive, and social cognitive performance, and a performance-based index of premorbid educational attainment. We hypothesised that premorbid functioning and cognitive performance would separate individuals who ever sustained competitive employment from those who never did. We further hypothesised that factors that predict job loss in schizophrenia, such as social cognitive challenges (such as emotion recognition) or psychosis, would characterise individuals who developed chronic unemployment after being able to sustain competitive employment.

Methods

Participants

The current data was collected from Phases 3 and 5 of the Social Cognition Psychometric Evaluation (SCOPE) study (Pinkham et al., 2016), a multisite study conducted at the University of Miami Miller School of Medicine (UM), Southern Methodist University, the University of Texas at Dallas (UTD), and the University of North Carolina at Chapel Hill (UNC). 396 participants between 18 and 65 years old with a diagnosis of Schizophrenia, Schizoaffective Disorder, or First Episode Spectrum Disorder were included in this analysis. Participants at UM were recruited at the Miami VA Medical Center and the Jackson Memorial Hospital-University of Miami Medical Center. SMU and UTD recruited from local clinics and Metrocare Services, a non-profit mental health service provider organisation located in Dallas County, Texas. UNC recruited participants from the Schizophrenia Treatment and Evaluation Program (STEPS) in Carboro, NC, as well as the Clinical Research Unit (CRU) in Raleigh, NC. Community advertisements were also used to recruit participants at all sites. To be eligible, participants required a DSM-IV diagnosis of schizophrenia or schizoaffective disorder. Patients could not have been hospitalised within the prior two months and had to be on a stable medication regimen for a minimum of six weeks, with no dose changes for a minimum of two weeks. Diagnostic and assessment procedures are described in detail in those two previous papers. The reason for selecting only patients without hospitalisations in the past two months was that the assessment of the stability of social cognitive performance was one of the goals of the study, which would be facilitated with more clinically stable patients.

Measures

In the different stages of the SCOPE study, several common measures were collected in the social cognitive, neurocognitive, clinical, and functional domains. In this paper, we report on these common measures.

Social cognition measures

The Bell Lysaker Emotion Recognition Task (BLERT; Bryson et al., 1997). The BLERT measures the ability to recognise seven emotional states: happiness, sadness, fear, disgust, surprise, anger, or no emotion. Participants are presented with the stimuli in

21 videos consisting of an actor depicting these different emotional states. The dependent variable was the total correct out of the 21 possible items.

The Penn Emotion Recognition Text (ER-40; Kohler et al., 2003). The ER-40 measures the ability to accurately identify four basic emotions (happiness, sadness, anger, and fear) and a neutral expression. Stimuli are presented via static photographs of faces presented on a monitor. The dependent variable is the total correct out of a possible score of 40.

Reading the Mind in the Eyes Test (Eyes; Baron-Cohen et al., 2001). The Eyes Test measures the capacity to understand the mental state of others from expressions in the eye region of the face. Participants were presented with 36 photos of the eye region of different faces and chose the most accurate descriptor for the mental state being expressed. The dependent variable is the total number correct of 36.

The Awareness of Social Inferences Test, Part III (TASIT; McDonald et al., 2003). TASIT assesses the detection of lies and sarcasm. Participants view 16 short videos of various social interactions, and after each video, respond to four questions about the intentions of the characters shown with yes/no choices. The dependent variable is the total number correct out of 64.

Hinting Task (Corcoran et al., 1995). The Hinting Task examines the ability of participants to infer the true intent of indirect speech. Ten short verbal passages that portray an interaction between two characters are presented, each passage ending with one of the characters hinting their true intent. Participants must state what the character meant. Partial credit is awarded if the first response was inaccurate and a second hint was delivered. The dependent variable is the total number correct out of 20.

Neurocognitive measures

An abbreviated version of the MATRICS Consensus Cognitive Battery (MCCB; Nuechterlein et al., 2008) was completed. It included the BACS-Symbol Coding, Trial Making Test-Part A, Category Fluency-Animal Naming, Letter-Number Span, and the Hopkins Verbal Learning Test (HVLN). For these variables, we used the raw score as the outcome variable.

The WRAT-3 Reading subscale was collected as an assessment of premorbid functioning inferred from word recognition reading performance, with the scaled score used as the variable (Jastak, 1993).

Clinical symptoms rating

The Positive and Negative Symptoms Scale (PANSS; Kay et al., 1987) was used for the clinical assessment. For group comparisons, we used the psychosis items from the Marder and Meibach (1994). Factor analysis, as well as the negative symptoms from that analysis.

Employment status

Functional milestone information was collected from participants, informants, and medical records. Current and lifetime history of employment was collected. In order to ensure the accuracy of the reports of employment achievements, a series of questions were asked. Participants were asked to describe their current job (if employed), their most recent job, and their best ever job. It is possible for these jobs to overlap with each other. Examples of job functions performed at each job were also collected to

obtain the best possible estimate of the participants' course of employment outcomes. The educational attainment of the participant and their parents was also collected.

Competitively obtained employment was the only work outcome considered for current or prior employment. In order to be designated as employed full time, participants had to be working full time for at least the past year. Full time work was designated as 30 h or more per week. Educational activities were not considered employment. We could not reliably confirm current or prior employment status on 162 of the 396 participants (41%). Included in this group were participants who had either only worked in supported employment or only worked part time. Also included in this excluded group were participants who stated that they were retired prior to standard retirement ages.

Procedures

Participants completed two study visits: a baseline and retest assessment conducted 2–4 weeks after the initial visit. The baseline visit consisted of informed consent, social cognitive and functional outcome measures, diagnostic assessment, and an evaluation of symptom severity. At the retest visit, symptom severity was reassessed, and neurocognitive and social cognitive measures were completed. This study uses data from the baseline visit, as well as the neurocognitive data from the second visit. All procedures were approved by the Institutional Review Board at each site and all participants signed an informed consent form.

Statistical analyses

Statistical analysis completed in SPSS version 26. We first created composite social cognition scores, by calculating the first principal component of the 5 tasks at each visit. We made this decision based on our previous findings these five tests were best described with a unifactorial structure (Browne et al., 2016). We then averaged these two principal component scores into a single aggregate score, because we already knew that there were no differences across the studies in the performance of the schizophrenia participants (Deckler et al., 2018). We used the same strategy of principal components analysis to create a single principal component for the cognitive variables. Finally, for the PANSS, we created total scores for psychosis items (hallucinations, delusions, conceptual disorganisation, unusual thought content, and paranoia), negative symptoms (Blunted Affect, Emotional withdrawal, Poor Rapport, Passive social withdrawal, lack of spontaneity, motor retardation, and active social avoidance), and an “avolition proxy” of Emotional withdrawal and passive social withdrawal. We then averaged these clinical symptoms ratings at each of the two assessments within each study.

Participants were divided into three groups: (1) Participants who had sustained full time competitive employment for the past year or more; (2) Individuals who never sustained competitive employment on a full time basis over a 1-year period; and (3). individuals who had sustained employment for at least 2 years but were currently unemployed for at least a two-year period. We used one-way analysis of variance, with Tukey follow-up tests with p set at $p < .05$ to compare the groups on the social cognitive and neurocognitive composite scores, as well as the PANSS Psychosis scale, the total negative symptom scale, the avolition proxy, and the WRAT-3 reading subtest. We

also corrected our alpha level to $p < .01$ in order to adopt a more conservative significance criteria. In the event that any one of the composite or total scores was significantly different between groups, we planned to follow up with tests of the individual elements of the scale (e.g., PANSS items, neurocognitive tests, or social cognitive tests).

Results

There were 51 currently employed participants and 183 unemployed participants. Of the unemployed participants 68 had never sustained employment for a 12-month period and 115 had worked for at least two years and had now been unemployed for two years. Characteristics of the participants are presented in Table 1. As can be seen in the table, participants who were currently employed or never sustained employment were more likely to be Caucasian. There were significant age differences across the groups, with the never employed patients the youngest, the formerly employed participants the oldest, and the currently employed group in the middle. Personal and maternal education were both higher in the currently employed participants, but there were no significant differences in educational attainment relative to maternal educational status. These participants had mothers with significantly more education than the other participants and they had achieved significantly less education than their mothers compared to the other participants. The median longest job tenure for the participants who never sustained employment was 4.8 months, which was considerably less than the other two groups. The median duration of unemployment was approximately 5 and 8 years across the two unemployed groups.

Scores on the clinical and performance-based measures are in Table 2. The currently employed participants had significantly higher WRAT-3 reading scores than the formerly employed group, although both of the unemployed groups had grade equivalent scores that were less than their formal years of education achieved. There were no significant differences in psychotic, negative, or avolition symptoms between the groups. Interestingly, there were significant differences in both the neurocognitive and social cognitive composite scores across the groups. In both cases, the currently employed participants

Table 1. Clinical, cognitive, and social cognitive characteristics differentiating patients as a function of employment status.

	Currently Employed		Never Employed		Formerly Employed		χ^2	p	Contrast
	(n=51)		(n=68)		(n=115)				
Sex % Male	68%		62%		67%		0.74	.69	
% Caucasian	66%		53%		38%		22.04	.005	C,N>F
% Latino	12%		21%		16%		1.73	.42	
	M	SD	M	SD	M	SD	F	p	Contrast
Age	41.45	10.75	35.75	11.70	47.97	8.83	31.68	<.001	F>C>N
Education	13.75	2.20	12.63	2.49	12.60	2.44	4.46	.013	C>F,N
Mothers Education	14.23	3.48	13.85	3.66	12.50	2.91	4.98	.008	C>F; N>F
Difference of Personal And Maternal Education	0.28	3.785	1.22	3.56	-0.10	3.34	1.92	.15	
		Median	Median		Median				
Longest Job Tenure, Months		48	4.8		35				
Current unemployment, Months		N/A	60		96				

performed better than the formerly employed group. These differences would not have met our adjusted significance criteria. However, when we tested all of the elements of the composite scores, we found that the formerly employed patients had poorer performance on emotion recognition, as measured by the BLERT, with the currently employed participants performing better than the formerly employed group. Larger differences were found on working memory, measured using the Letter Number Sequencing task, with the currently employed participants performing better than both the other groups. Both of these differences would have an adjusted criterion for statistical significance.

Discussion

The development of chronic unemployment after initial success in competitive employment appears to share many characteristics with the predictors of never having sustained employment. In our sample of largely unemployed participants, a substantial number had achieved previous vocational success and then developed chronic unemployment of relatively long duration. Higher educational attainment and better working memory performance separated those participants who were currently employed from those who never worked or former members of the labour force who are currently unemployed. Emotion recognition and WRAT reading scores also separated participants with current employment from formerly employed participants.

When we examine the extent of impairment in the formerly employed participants, two findings emerge and would survive correction for multiple comparisons. The level of impairment in emotion recognition is substantial and would be 1.4 SD below the healthy control means in the two previous studies (Pinkham et al., 2016, 2018). Performance on the working memory task is quite impaired as well, with both unemployed groups performing about 0.8 SD below healthy controls normative standards and the currently employed participants were actually performing at the 50th percentile of the normative distribution.

The question arises as to whether the long-term unemployed participants differ in any meaningful way from those participants who never sustained employment. The only statistically significant differences were a higher likelihood of being African American and

Table 2. Clinical, cognitive, and social cognitive characteristics of patients who were never employed versus those who developed long term unemployment

	Currently Employed		Never Employed		Formerly Employed		F	p	Contrast
	(n=51)		(n=68)		(n=115)				
	M	SD	M	SD	M	SD			
WRAT-3 Reading	97.35	13.93	94.5	16.33	90.80	14.57	3.71	.026	C>F
Psychotic Symptoms	13.26	5.09	14.41	5.77	15.27	5.28	2.84	.06	
Negative Symptoms	13.00	6.25	14.05	6.81	13.06	5.78	0.64	.53	
Avolition Proxy	4.00	2.06	4.03	2.44	4.31	2.38	0.44	.64	
Composite NeuroCognition	0.26	1.07	0.00	0.95	-.22	0.98	4.20	.016	C>F
Composite Social Cognition	0.17	1.01	0.11	1.00	-.19	0.83	3.57	.03	C>F
Bell Lysaker Emotion Recognition Test	14.38	4.20	13.90	3.96	12.43	3.57	6.20	.002	C>F
Letter Number Sequencing	14.19	3.34	11.92	3.73	11.70	4.07	14.69	.001	C>F,N

age. Previous studies of large samples of participants with chronic schizophrenia have also found that age and African American racial status was associated with current unemployment (Rosenheck et al., 2006). It is possible that the convergence of being a racial minority and having the experience of schizophrenia contribute to challenges in re-entering the labour market. Two of the three states where the data were collected in this study do not have Medicaid expansion and there are extremely limited vocational rehabilitation services available to patients such as those in this study so this may also be a factor in unemployment becoming sustained once it occurs. As a result, social disadvantage may play a role in the inability to sustain competitive employment, with 2 of the 3 states where the studies were done being well known for providing minimal opportunities to those with severe mental illness.

As we are performing a retrospective analysis, we do not know how well the formerly employed participants performed at their job when they were employed and whether obtaining a first job is easier than re-entering the labour force. Previous reviews of the literature on employment in schizophrenia implicate poor premorbid functioning and reduced educational attainment as the primary predictors of poor vocational outcomes (McGurk & Mueser, 2013). This is seen to an extent in the current dataset. Further, the variables that we found to differ between cases with continued vocational success and those without are commonly identified to be predictors of success: cognition, social cognition, and more education and educational achievement.

The limitations of the study include self-reported vocational functioning. We attempted to mitigate biases by collecting extensive details regarding employment, such as the number of jobs worked and the longest duration at a job. Further, there is no clear definition of what constitutes never having worked. Only 3% of our sample stated that they had never worked at all, but the median reported longest duration of employment for cases who we classified as never working was 4 months. In some samples, the proportion of cases who have reported never working at all is as much as 33% (Gould et al., 2013). The rate of current employment in this sample was close to expected rates, at about 13% when employment as defined by sustaining competitive employment for at least the past year. Lastly, while our findings were significant, directionality cannot be implied. For instance, in the case of formerly employed participants having significantly poorer emotional recognition when compared to the currently employed group, we cannot conclude that this is a result of becoming unemployed for an extended period, nor can we say that reduced emotional recognition led to long-term unemployment. However, educational and reading scores are not possible consequences of employment outcomes and are instead precursors of vocational outcomes.

Our major finding is that even among those people with schizophrenia with a history of vocational success, albeit limited in many cases, the correlates of chronic unemployment do not look markedly different from the determinants of never having worked. Although vocational tenure seems to decline over time, there are differences in predictive factors. Currently employed patients have greater personal and maternal educational attainment than those who are currently unemployed. However, cases who developed chronic unemployment after initial vocational success, have evidence of poorer performance on social cognitive and neurocognitive domains. As recent clinical trials have shown benefits of social cognitive (Nahum et al., 2020) and neurocognitive (McGurk et al., 2015) training, and their combination (Lindenmayer et al., 2018) it is

possible that such interventions, if available, could reverse these acquired adverse competitive employment outcomes.

Disclosure statement

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