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The course of vocational functioning in patients with schizophrenia: Re-examining social drift

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Abstract

Vocational functioning is markedly impaired in people with schizophrenia. In addition to low rates of employment, people with schizophrenia have been reported to be underachieved compared to other family members. Among the causes of this vocational impairment may be cognitive deficits and other skills deficits, as well as social factors impacting on opportunities for employment. In this study, we examined two separate samples of people with schizophrenia who differed in their educational and social backgrounds. We compared personal and maternal education in people with schizophrenia attending an outpatient rehabilitation facility (n = 57) or receiving outpatient services at a VA medical center (n = 39). The sample as a whole showed evidence of decline in vocational status from their best job to their most recent job. Patients attending a rehabilitation facility had completed less education than their mothers, while the VA patients completed more. Differences between personal and maternal education predicted the difference in status between best and latest jobs in the sample as a whole. VA patients were more likely to be living independently and performed better on a measure of functional capacity than the rehabilitation sample. These data implicate vocational decline in schizophrenia and also suggest that this decline may originate prior to the formal onset of the illness. At the same time, vocational outcomes appear to be related to social opportunities.

Keywords

Schizophrenia; Employment; Education; Cognition

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Conflict of interest

Dr. Harvey has received consulting fees from Abbvie, Boehringer Ingelheim, Forest Labs, Genentech, Otsuka America, Roche Pharma, Sunovion Pharma, and Takeda Pharma during the past year. None of the other authors have any commercial interests to report. No other authors report any other outside activities.

Contributors

Drs. Harvey and Patterson designed the overall study and obtained funding. Ms. Vargas conceptualized and conducted the current analyses and wrote the first draft of the paper. Dr. Harvey provided scientific oversight throughout the project and edited the manuscript. Drs. Durand, Gould, Sabbag, Strassnig, Patterson, and Ms. Stone provided detailed comments to the paper across three drafts of the manuscript.

1. Introduction

The relationship between socio-economic status and schizophrenia has been the subject of much research. Disability in everyday functioning is common among people with schizophrenia and many people with schizophrenia are part of low socio-economic groups. For instance, in a 2008 survey of VA patients with schizophrenia ($n > 92,000$), more than 95% were either earning income under the federal cut-off for poverty or were receiving 100% service connected disability (VA disability information, accessed September 20, 2008). The origin of reduced socio-economic status has been discussed for decades. One suggestion is the social-drift hypothesis, which argues that aspects of severe mental illness lead to reductions in social attainment. Among patients with schizophrenia, it is widely known that unemployment and receipt of disability compensation are quite common (Harvey et al., 2012a) and that, compared to other mental illnesses, schizophrenia has the highest total burden of social disability (Murray and Lopez, 1997).

Educational attainment is a potent predictor of social class in Western cultures. In patients with schizophrenia, educational attainment has been studied as a measure of premorbid function as well as a predictor of outcome in schizophrenia. Individuals with more education have a later age of disease onset, lower levels of psychotic symptomatology, and better global cognitive function (Swanson et al, 1998). With regards to symptomatology, the effect of education on positive versus negative symptoms is inconsistent. Generally, more years of education are associated with reduced negative symptoms in first episode (Heydebrand et al, 2004) and chronic patients (Swanson et al 1998). Our group and others have shown that premorbid educational attainment is significantly related to current functional status (Harvey et al, 2006). In later analyses of a different sample of patients, we found that education exerted its influence indirectly on reduced real-world functioning through its association with cognitive impairment and not in a more direct manner (Gould et al., 2012).

In addition to premorbid educational attainment of the patient, parental education and low familial socio-economic status may also be risk factors for poor outcome in schizophrenia. This model has been presented as the social stress hypothesis. As schizophrenia occurs more commonly in children of parents with less education, such as in immigrant and/or urban families (Weiser et al., 2007; 2008), it is also possible that patients with schizophrenia grow up in low socio-economic status environments only to end up even lower. The typical hypothesis for these findings is that poverty and its consequences increase life stress, and is often associated with abuse and neglect, which in turn increase the risk for developing a variety of psychiatric conditions, including schizophrenia (Schafer and Fisher, 2011).

Cognitive impairment in patients with schizophrenia is substantially associated with social impairment and functional outcomes, including employment, independent living, and everyday functioning (Bowie and Harvey, 2005; Fett et al., 2011). Meta-analyses have suggested that cognitive impairment including reduced intellectual functioning are commonly present prior to the onset of any other symptoms of schizophrenia, more pronounced in the prodromal phase, and clearly present at the time of the first episode (Woodberry, et al., 2008; Mesholam-Gately, et al., 2009). These reviews clearly showed that

that children who later developed schizophrenia manifest intellectual differences as early as by 13–16 years of age. Moreover, and relevant to our analyses, there appears to be a significant drop in standardized test scores from grade 8 to grade 11 in children who later developed schizophrenia, which is not seen in the mentally healthy student population. Multiple academic skills appear to be compromised prior to the onset of schizophrenia, with these impairments greater in individuals who develop schizophrenia compared to mood disorders (Reichenberg et al., 2002).

The effect of schizophrenia on vocational functioning and employment status in patients has been studied extensively. In a variety of prospective analyses, competitive employment was predicted by prior work experience, patient education level, cognitive impairment, and social functioning (McGurk and Mueser, 2013). Moreover, patients maintaining full-time employment were significantly better educated and engaged in work tasks that were more cognitively complex than patients who were employed part-time or unemployed (McGurk and Meltzer, 2000). This possibly suggests that both premorbid function and cognitive abilities affect employment status. Furthermore, employment has been shown to be an important element of treatment outcome, positively associated with symptomatic remission and recovery and negatively associated with relapse (Bryson et al., 2002). Among disability applicants with schizophrenia, most remain impaired in occupational and other functional domains despite symptomatic remission (Harvey et al, 2012b). Research from the large-scale CATIE study (Rosenheck et al., 2006) found that environmental and demographic variables were also associated with employment outcomes. Being African-American and being a recipient of disability compensation were stronger predictors of employment than symptoms and cognitive deficits

We analyzed results from data collected in the VALERO study (Validation of Everyday Real-World Outcomes; Harvey et al., 2011; Leifker et al., 2011) which aimed to refine the assessment of everyday outcomes in schizophrenia with a focus on the validity of rating scales that measure treatment effects on real-world outcomes. We examined the lifetime history of vocational attainment of patients with schizophrenia, comparing the status of their best and most recent jobs while using several variables relevant to the social drift and social stress hypotheses, including maternal and personal educational attainment, as predictors of the course of vocational functioning. We also used indices of current cognitive performance and the ability to perform critical everyday living skills (i.e., functional capacity) to predict vocational functioning.

We capitalized on the opportunity to compare two potentially different subpopulations within the overall VALERO sample. These include a sample of outpatients with chronic schizophrenia from the Atlanta VA Medical Center and a sample of patients receiving structured rehabilitation services at an outpatient psychiatric rehabilitation center. These samples are demographically different, in terms of racial status, parental educational status, and current engagement in treatment. As a result, we were able to identify samples of people with schizophrenia from different socio-demographic backgrounds and contrast the evidence for the social drift and social stress hypotheses in terms of prediction of the course of vocational functioning. Using these quite different subgroups of people with schizophrenia

allow us to examine both constancies and differences in the outcomes and their predictors across samples with wide variation in family background and life experiences.

2. Method

2.1. Subjects

Study participants were patients with schizophrenia who were receiving treatment at one of two different outpatient service delivery systems in Atlanta. All research participants provided signed, informed consent, and this research study was approved by the local IRB. Patients were either recruited at an intensive psychiatric rehabilitation program (Skyland Trail) or from the general outpatient population of the Atlanta VA Medical Center. All patients with schizophrenia were administered the Structured Clinical Interview for the DSM-IV (SCID; First et al, 1995) by a trained interviewer. All diagnoses were subject to a consensus procedure. Patients were excluded if they had a history of traumatic brain injury with unconsciousness >10 minutes, brain disease such as seizure disorder or neurodegenerative conditions, 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.

2.2. Procedure

2.2.1. Premorbid intelligence estimates—We administered the Wide Range Achievement Test Revised (WRAT-III; Wilkinson, 1994), a reading ability test that has offered a valid assessment of premorbid functioning in patients with schizophrenia and has been reported to remain stable over time (Harvey et al, 2006). The WRAT-III dependent variable was the total score for words read correctly.

2.2.2. Clinical symptom ratings—Clinical ratings were collected with the Positive and Negative Symptom Scale (PANSS, Kay 1991), a validated 30–40 minute interview assessing symptomatology (e.g. delusions, hallucinations, thought disorganization, hostility, depression, anxiety), which yields several variables, including a total score which was used in these analyses.

2.2.3. Performance-based ability assessments—We examined cognitive performance with a modified version of the MATRICS consensus cognitive battery (MCCB, Neuchterlein et al, 2008). For this study, we did not include the social cognition measure from the MCCB, the Mayer-Salovey-Caruso Emotional Intelligence Test Managing Emotions. We calculated a composite score, the average of nine age-corrected t-scores based on the MCCB normative program, as our critical dependent variable.

2.2.4. Functional capacity—We administered the Brief version of the UCSD Performance-Based Skills Assessment (UPSA-B; Mausbach et al, 2007). The UPSA-B is a measure of functional capacity in which patients are asked to perform everyday tasks related

to communication and finances. During the *Communication* subtest, participants role play exercises using an unplugged telephone (e.g., emergency call; dialing a number from memory; calling to reschedule a doctor's appointment). For the *Finance* subtest, participants count change, read a utility bill, and write and record a check for the bill. The UPSA-B requires approximately 10–15 minutes, and raw scores are converted into a total score ranging from 0–100 with higher scores indicating better functional capacity.

2.2.5. Functional milestone achievements—We collected information from patients, informants, and medical records on the achievement of various functional milestones. For employment, we collected current and lifetime history of supported or competitively obtained employment (either part or full-time) regardless of duration or reason for termination. In addition, we recorded details about the current job, most recent job, and best job. Most patients were currently unemployed, but for those who were employed, their current job was the one of interest. For each category, job status was rated using the Hollingshead Four Factor Index of Social Status (Hollingshead, 1975), which assessed vocational achievement based on a structured rating of the quality and complexity of the job. The highest level of occupation was measured on a scale from 1 to 9, where 1 was equal to farm laborer or day laborer and 9 was equal to senior manager, professional, or CEO of a large business. For residential status, we determined whether the individuals were currently living without supervision and personally financially responsible for their housing (even if they used disability compensation to pay their bills) using the methods we previously employed (Harvey et al, 2012). Educational attainment was measured by number of years of patient and maternal education.

2.3. Data analyses

We answered several questions with our data analyses. We compared the two samples for demographic differences and performance on the MCCB and the UPSA-B, as well as for the status of their best and most recent job. We also compared differences between personal and maternal education and the relationships of those variables to the status of the current and best job. These analyses were performed with t-tests and chi-square tests. For correlational analyses, we examined the correlation between the job status and educational variables and between the job status and the performance-based MCCB and UPSA.

3. Results

3.1. Demographics

Descriptive information and assessment performance on patients is presented in Table 1. Both samples were predominantly male and non-Hispanic. The Skyland Trail patients were more frequently Caucasian ($p < 0.001$) compared to the VA patients. The Atlanta VA patients were more commonly African American ($p < 0.0001$) and more likely to be financially responsible for their current residence ($p < 0.001$) than the Skyland Trail patients. Moreover, 60% of Skyland Trail patients compared to 15% of VA patients lived in a supervised residential facility. Patients at Skyland Trail had one more year of educational attainment compared to VA patients and this difference was statistically significant. Mothers of Skyland Trail patients had significantly more years of education than mothers of VA

patients ($p < .001$). Interestingly, Skyland Trail patients had significantly less education than their mothers ($p < 0.05$) while VA patients had more ($p < 0.005$). Skyland Trail patients had significantly poorer performance on the UPSA than VA patients ($p > 0.001$). Differences on the MCCB total score and total PANSS scores were not significant.

3.2. Vocational functioning

Figure 1 presents the changes in vocational functioning over the course of illness for the two samples. As can be seen in the figure, 48% of cases experienced no decline in status from their best job to their most recent job, indicating that more than half of the sample experienced worsening. In fact, 17% of cases had a most recent job that was two or more social categories worse than their best job.

Table 2 presents comparative vocational functioning statistics for the two groups. Lifetime job status differed significantly between the Skyland Trail and Atlanta VA patients. Skyland Trail patients had “best jobs” of significantly greater status compared to the Atlanta VA cohort and they also had latest jobs of significantly higher status. With the two groups combined, there was a statistically significant decline in vocational status from best to most recent job, $t(75) = 4.20$, $p < 0.001$; the changes within each group were also statistically significant (both $t > 2.60$, both $p < 0.02$). Underscoring these findings is the fact that patients who did not decline in their vocational status had best jobs of significantly lower social status (mean = 2.4, SD = 1.2) than those patients who showed vocational status decline (mean = 3.7, SD = 0.8): $t(75) = -4.24$, $p < .001$. Thus, patients who started out with higher status jobs, with more room for decline, showed more decline and had most recent jobs that were similar to those held by people who started out with lower status jobs.

These patient samples differed considerably in the age. When we used Pearson correlations to examine the association between age and best job, last job, and changes in vocational status in the two samples separately, none of the correlations were statistically significant or substantial in size (all $r < .17$, all $p > .16$). These data may suggest that vocational decline occurs early in the illness, as these samples differed in age by nearly 10 years and the Skyland trail patients, although younger, showed evidence of greater vocational decline.

3.3. Education correlates

Table 3 presents information regarding the correlations between personal and maternal education and their difference, as well as clinical symptoms, performance-based measures, and vocational outcomes. There was significant association between total years of patient education and the WRAT-III for Skyland Trail patients. In this sample, the total years of patient education was not associated with performance on either the MCCB or the UPSA-B. Maternal education was not associated with any of the symptomatic or performance-based measures. Reduced educational attainment compared to the mother’s achievement was associated with more severe total PANSS scores. In the VA sample, neither the correlations between personal and maternal educational attainment or their difference nor the symptomatic and performance-based variables were significant.

We computed Pearson correlations between the status scores for the current, best and changes in job status in the two samples separately. In the Skyland trail sample, reduced

educational attainment compared to the mother was correlated with significantly lower status of the best job ($p < 0.05$) and lower status for the most recent job. Greater maternal education also was correlated with higher status for the most recent job.

3.4. Cognitive performance

In a final analysis predicting vocational functioning, we computed Pearson correlations between UPSA-B total scores and MCCB scores and the status of the best and latest jobs, as well as the difference, in the two samples. Lower MCCB scores predicted greater decline from best to latest job in the Skyland trail patients ($r = .41$, $p < 0.005$), but none of the other vocational outcomes were correlated with the performance based measures (all $r < .21$, all $p > 0.19$). In the Atlanta VA patients, none of the correlations were significant (all $r < .29$, all $p > 0.09$). Thus, poorer cognitive performance predicted vocational declines in the group with the highest level of baseline attainment.

4. Discussion

In this study, we found that samples of schizophrenia patients from different socio-economic backgrounds had different levels of vocational functioning, different patterns of variations in educational attainment between mothers and patient offspring, and slightly differing courses and correlates of vocational attainment. Despite better premorbid functioning, higher family educational attainment, and higher current employment rates, patients recently admitted to a private rehabilitation facility (Skyland Trail) had more disability in the domain of independent living skills than stable patients at a VA hospital, as evaluated by UPSA-B, and were less likely to be financially responsible for their residence. Moreover, the Skyland Trail patients held jobs of greater complexity as their best job and most recent job compared to the Atlanta VA patients. This not only suggests that Skyland Trail patients had greater access to educational and vocational opportunities prior to onset of symptoms but also that a subset of this sample experienced the greatest decline from premorbid status. Further, there was significant decline in vocational attainment across the entire sample of patients, amongst which patients with higher-status jobs were at the highest risk for decline over time. Patient age did not correlate with vocational functioning or vocational decline. These results suggest that vocational decline is not part of a long-term deteriorating course; the younger Skyland Trail patients had experienced more vocational decline.

There are several limitations of this study. The samples of patients were from a single geographic area. We did not attempt to stratify our sample on the basis of vocational attainment and they differ in age. Although we confirmed our assessment of vocational status with informants and use of records, it is still possible that there are some errors in terms of vocational status. Employment is determined by many factors other than individual differences ability variables.

It is possible that the increased maternal education among the Skyland Trail patients may have been correlated with initial access to higher status jobs compared to the VA patients. However, those individuals in the Skyland Trail subsample who had greatest relative educational underachievement also manifested the lowest level of status in their initial jobs, suggesting an interaction between ability and opportunity in terms of vocational functioning.

It is widely understood (e.g., Rosenheck et al., 2006) that disability compensation may provide a disincentive to seek employment, leading to low levels of employment in compensated patients and a disconnection between levels of skills and real-world achievement (Harvey et al., 2009).

These results also suggest that educational underachievement relative to parental attainment is not inevitable in patients with schizophrenia. The Skyland Trail patients, whose mothers have levels of educational attainment higher than the national average, completed less education than their mothers, while the Atlanta VA patients had increased attainment compared to their mothers. Again, environmental factors may play a role. The largely African-American mothers of these middle aged patients may have had access only to substandard educational opportunities as children educated in the South prior to the 1960s. Further, these patients are all veterans and it is not clear whether their educational attainment was associated with equivalent quality compared to the younger Skyland Trail patients.

In conclusion, the current results provide information that shows that declines in vocational status are very common in people with schizophrenia but that the determinants are multi-dimensional. Further, premorbid educational attainment appears to be related to parental social status. In a very interesting analysis of a large ($n > 800,000$) population sample, Goldberg et al. (2011) reported that lifetime socio-economic status (SES) and cognitive performance interacted. SES was only related to risk for schizophrenia in individuals with the lowest levels of cognitive performance. Cases with poorer cognitive performance from high SES backgrounds had higher risk for schizophrenia and poorer outcomes. Thus, evidence of decline from higher, better levels of overall life functioning is associated with schizophrenia and with risk for poorer outcomes in the illness, including evidence of vocational drift and inability to live independently.

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References

- Bowie CR, Harvey PD. Cognition in schizophrenia: impairment, determinants, and functional importance. *Psychiatr Clin N Am*. 2005; 28:613–633.
- Bryson G, Lysaker P, Bell M. Quality of life benefits of paid work activity in schizophrenia. *Schizophr Bull*. 2002; 28:249–257. [PubMed: 12693431]
- Fett AK, Viechtbauer W, Dominguez MD, Penn DL, van Os J, Krabbendam L. The relationship between neurocognition and social cognition with functional outcome in schizophrenia: a meta-analysis. *Neurosci Biobehav Rev*. 2011; 35:573–588. [PubMed: 20620163]
- First, MB.; Spitzer, RL.; Gibbon, M.; Williams, JBW.; Benjamin, LS. User's guide for the Structured Clinical Interview for DSM-IV Axis I (SCID-I). American Psychiatric Press; Washington, DC: 1995.

- Goldberg S, Fruchter E, Davidson M, Reichenberg A, Yoffe R, Weiser M. The relationship between risk of hospitalization for schizophrenia, SES, and cognitive functioning. *Schizophr Bull.* 2011; 37:664–670. [PubMed: 21602306]
- Gould F, Bowie CR, Harvey PD. The influence of demographic factors on functional capacity and everyday functional outcomes in schizophrenia. *J Clin Exp Neuropsychol.* 2012; 34:467–475. [PubMed: 22272559]
- Harvey PD, Friedman JI, Bowie CR, Reichenberg A, Parrella M, White L, Davis KL. Validity and stability of performance-based estimates of premorbid educational functioning in older patients with schizophrenia. *J Clin Exp Neuropsychol.* 2006; 28:178–192. [PubMed: 16484092]
- Harvey PD, Heaton RK, Carpenter WT Jr, Green MF, Gold JM, Schoenbaum M. Functional impairment in people with schizophrenia: focus on employability and eligibility for disability compensation. *Schizophr Res.* 2012a; 140:1–8. [PubMed: 22503642]
- Harvey PD, Helldin L, Bowie CR, Heaton RK, Olsson AK, Hjärthag F, Norlander T, Patterson TL. Performance-based measurement of functional disability in schizophrenia: a cross-national study in the United States and Sweden. *Am J Psychiatry.* 2009; 166:821–827. [PubMed: 19487393]
- Harvey PD, Raykov T, Twamley EW, Vella L, Heaton RK, Patterson TL. Validating the measurement of real-world functional outcome: phase I results of the VALERO study. *Am J Psychiatry.* 2011; 168:1195–1201. [PubMed: 21572166]
- Harvey PD, Sabbag S, Prestia D, Durand D, Twamley EW, Patterson TL. Functional milestones and clinician ratings of everyday functioning in people with schizophrenia: overlap between milestones and specificity of ratings. *J Psychiatric Res.* 2012b; 46:1546–1552.
- Heydebrand G, Weiser M, Rabinowitz J, Hoff AL, DeLisi LE, Csernansky JG. Correlates of cognitive deficits in first episode schizophrenia. *Schizophr Res.* 2004; 68:1–9. [PubMed: 15037334]
- Hollingshead, AB. Four factor index of social status. Department of Sociology, Yale University; New Haven, CT: 1975.
- Kay, SR. Positive and negative syndromes in schizophrenia. Brunner/Mazel; New York: 1991.
- Leifker FR, Patterson TL, Heaton RK, Harvey PD. Validating measures of real-world outcome: the results of the VALERO Expert Survey and RAND Panel. *Schizophr Bull.* 2011; 37:334–343. [PubMed: 19525354]
- Mausbach BT, Harvey PD, Goldman SR, Jeste DV, Patterson TL. Development of a brief scale of everyday functioning in persons with serious mental illness. *Schizophr Bull.* 2007; 33:1364–1372. [PubMed: 17341468]
- McGurk SR, Meltzer HY. The role of cognition in vocational functioning in schizophrenia. *Schizophr Res.* 2000; 45:175–184.
- McGurk, SR.; Mueser, KT. Cognition and work functioning in schizophrenia. In: Harvey, PD., editor. *Cognitive impairment in schizophrenia: characteristics, assessment, and treatment.* Cambridge University Press; Cambridge, UK: 2013.
- Mesholam-Gately RI, Giuliano AJ, Goff KP, Faraone SV, Seidman LJ. Neurocognition in first-episode schizophrenia: a meta-analytic review. *Neuropsychology.* 2009; 23:315–336. [PubMed: 19413446]
- Murray CJL, Lopez AD. Global mortality, disability, and the contributions of risk factors: global burden of disease study. *Lancet.* 1997; 349:1436–1442. [PubMed: 9164317]
- Neuchterlein KH, Green MF, Kern RS, Baade LE, Barch D, Cohen J, et al. The MATRICS Consensus Cognitive Battery: Part 1. Test Selection, Reliability, and Validity. *Am J Psychiatry.* 2008; 165:203–213. [PubMed: 18172019]
- Reichenberg A, Weiser M, Rabinowitz J, Caspi A, Schmeidler J, Mark M, et al. A population-based cohort study of premorbid intellectual, language, and behavioral functioning in patients with schizophrenia, schizoaffective disorder, and nonpsychotic bipolar disorder. *Am J Psychiatry.* 2002; 159:2027–2035. [PubMed: 12450952]
- Rosenheck R, Leslie D, Keefe R, McEvoy J, Swartz M, Perkins D, et al. Barriers to employment for people with schizophrenia. *Am J Psychiatry.* 2006; 163:411–417. [PubMed: 16513861]
- Schäfer I, Fisher HL. Childhood trauma and psychosis – what is the evidence? *Dialogues Clin Neurosci.* 2011; 13:360–365. [PubMed: 22033827]

- Swanson CL Jr, Gur RC, Bilker W, Petty RG, Gur RE. Premorbid educational attainment in schizophrenia: association with symptoms, functioning, and neurobehavioral measures. *Biol Psychiatry*. 1998; 44:739–747. [PubMed: 9798078]
- Weiser M, van Os J, Reichenberg A, Rabinowitz J, Nahon D, Kravitz E, et al. Social and cognitive functioning, urbanicity and risk for schizophrenia. *Br J Psychiatry*. 2007; 191:320–324. [PubMed: 17906242]
- Weiser M, Werbeloff N, Vishna T, Yoffe R, Lubin G, Shmushkevitch M, Davidson M. Elaboration on immigration and risk for schizophrenia. *Psychol Med*. 2008; 38:1113–1119. [PubMed: 17988415]
- Wilkinson, G. *The Wide Range Achievement Test. 3*. The Psychological Corporation; San Antonio, TX: 1994.
- Woodberry KA, Giuliano AJ, Seidman LJ. Premorbid IQ in schizophrenia: a meta-analytic review. *Am J Psychiatry*. 2008; 165:579–587. [PubMed: 18413704]



Fig. 1.
Change in job status from best job to most recent job.

Table 1

Demographic information and performance-based scores for two different treatment sites.

	Skyland trail		Atlanta VA		X ²	p
	N	%	n	%		
Sex (% male)	38	69	30	75	0.36	0.55
Race/ethnicity characteristics						
Caucasian	43	78	9	23	28.50	0.001
African-American	10	18	30	77		
Other	2	4	0	0		
Hispanic	2	4	0	0		
Financially responsible for residence (yes)	6	12	18	42	9.48	0.001
Current employment status						
Employed	13	23	5	12	1.28	0.26
Unemployed	40	73	34	88		
Retired	2	4	0	0		
	M (SD)	M (SD)	t	p		
Age	36 (14.1)	47 (8.6)	4.69	0.001		
Total education (years)						
Patient	14.2 (2.9)	13.0 (1.7)	2.51	0.01		
Mother	15.0 (2.8)	11.2 (3.0)	6.21	0.001		
Educational difference	0.8 (3.5)	-1.6 (2.6)	3.81	0.005		
UPSA-B	75 (14.4)	82 (13.2)	2.87	0.001		
Composite MCCB	39 (7.9)	38 (6.3)	0.68	0.75		
PANSS total	62 (13.6)	65 (15.9)	0.96	0.17		

Note. MCCB Scores are t-scores (m = 50; sd = 10). Maximum score on the UPSA-B = 100.

Table 2

Job status across the groups.

	Skyland trail		Atlanta VA		t	p	
	N	SD	N	SD			
Best Job	41	3.15	36	2.44	1.2	2.49	0.01
Last Job	33	2.64	37	1.97	0.9	2.48	0.02
Job Change	33	-0.76	33	-0.33	0.7	2.02	0.05

Note. 9-point (1–9) scale. 1 is lowest and 9 is highest.

Table 3

Correlates of vocational functioning across treatment sites.

	WRAT	PANSS	UPSA-B	MCCB	Best Job	Last Job	Job Change
Skyland Trail							
Total years of patient education	0.40**	0.24	0.09	0.01	0.24	0.09	-0.01
Total years of mother's education	0.10	-0.22	-0.10	0.15	0.25	0.33*	-0.20
Educational Differences	-0.25	-0.38**	-0.16	0.12	-0.36**	-0.30*	-0.01
Atlanta VA							
Total years of patient education	0.03	-0.12	0.12	0.29	0.14	0.00	-0.02
Total years of mother's education	-0.13	-0.16	0.08	0.14	0.32*	0.17	-0.18
Educational Differences	0.00	-0.03	-0.01	-0.12	0.37*	0.17	-0.22

* p < 0.05,

** p < 0.01.

Job status change.

Percentage of cases.