A Prospective Analysis of Work in Schizophrenia

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Abstract

This study examined the longitudinal course of competitive employment in patients with schizophrenia following treatment for an acute exacerbation, and prospectively predicts work approximately 2 years later from sociodemographic and clinical characteristics. A sample of 528 patients was assessed at baseline, and 313 were followed up 1 and 2 years later. Assessments included sociodemographic characteristics, premorbid functioning, work history, symptoms, social functioning, recent efforts to find work, and interest in work. Analyses examined changes in competitive work from baseline to the followups, the correlates of work history, the prospective prediction of work at the 1- and 2-year followup assessments, and correlates of competitive work. Competitive employment increased significantly from 10 percent at baseline to 23 percent and 21 percent at the 1- and 2-year followups, respectively. At baseline, among patients who were not competitively working, 61 percent reported interest in working. Patients who were not competitively employed at baseline but reported making recent efforts to find work were more likely to be working at the followups than other not employed patients. Work at the 1- and 2-year followups was predicted by prior work experience, patient and mother's educational level, cognitive impairment, and social functioning. Similar correlates of current work status were found. Interventions may need to target educational level, cognitive impairment, and social competence and functioning in order to improve the competitive employment outcomes of persons with schizophrenia.

Keywords: Schizophrenia, employment, labor force, vocational, symptomatology, functioning.

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Problems in work functioning, like those in social functioning, have long been recognized as a hallmark of schizophrenia, as illustrated by their inclusion in modern diagnostic criteria for the disorder (American Psychiatric Association 1994). The onset of schizophrenia is typically associated with a pronounced decline in employment and socioeconomic status (Aro et al. 1995). Rates of competitive employment in schizophrenia and other severe mental illnesses tend to be low, with most estimates in the 10–20 percent range (Anthony and Blanch 1987; Rogers et al. 1988; Brekke et al. 1993). The low employment rate of individuals with schizophrenia is associated with a number of disadvantages, including limitations on financial resources, over-reliance on families and entitlements to meet basic living needs, social stigma, and poor self-esteem (Brekke et al. 1993; Mueser et al. 1997). Furthermore, surveys suggest that the majority of nonemployed persons with severe mental illness desire employment (Rogers et al. 1991).

Despite the importance of paid work in schizophrenia, relatively little is known about the determinants and predictors of employment. Research on work in schizophrenia suggests three general findings. First, premorbid social functioning predicts work functioning after the onset of schizophrenia (Harrow et al. 1986; MacEwan and Athawes 1997). In addition, social functioning is moderately correlated with work, both concurrently and prospectively (Strauss and Carpenter 1974, 1977; Breier et al. 1991; Carpenter and Strauss 1991; Jonsson and Nyman 1991; Srinivasan and Thara 1997). Second, work history, including premorbid work experience, is consistently the most robust predictor of future work (Strauss and Carpenter 1974, 1977; Huffine and Clausen 1979; Carpenter and Strauss 1991; Arns and Linney 1995; Drake et al. 1996). Third, symptom severity is somewhat related to worse work functioning or lower likelihood of working, both concurrently and prospectively, with negative symptoms more strongly associated with work than

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positive symptoms (Strauss and Carpenter 1974, 1977; Kay and Murrill 1990; Breier et al. 1991; Jonsson and Nyman 1991; Brekke et al. 1993; Anthony et al. 1995; Hoffman and Kupper 1997; MacEwan and Athawes 1997; Mueser et al. 1997).

These studies leave open several questions about the relationships between work and other areas of functioning in schizophrenia. Because most prior research on outcomes in schizophrenia has focused on a range of different areas of functioning, the relationships between these areas and work usually have been examined only with simple (zero order) correlations. It is unclear whether other areas of functioning are predictive of work in schizophrenia after statistically controlling for prior work history. Understanding patient and family predictors of work may be important for identifying factors that contribute to patients' employability.

Another unresolved question is whether labor force participation and unemployment rates in schizophrenia change over the course of a recovery from a symptom exacerbation. Although employment rates are low in schizophrenia, there are few data about the desire for work among nonemployed patients, their efforts to find jobs, and the relationships between desire for work and subsequent employment. In classifying nonworking individuals, labor force statistics distinguish between being "unemployed," defined as including those actively seeking employment (or temporarily laid off), and "out of the labor force," which refers to those not seeking employment. Studies of the general population suggest that the distinction predicts later employment, although the evidence is not entirely consistent (Clark and Summers 1979; Flinn and Heckman 1983; Tano 1991; Gönül 1992).

This study was conducted in order to examine the natural course of work in a large cohort of schizophrenia patients recently recovering from a symptom exacerbation, assessed at five different treatment centers. In addition to examining rates of employment over 2 years following a relapse, we also examined desire for work and efforts to find employment. To identify predictors of work, we evaluated the relationships between work history and demographic, clinical, and social functioning measures at baseline, and prospectively examined the prediction of work at the followup assessments, controlling for prior work history. Finally, to determine the correlates of work in this sample, we examined the associations between work, functioning, and recent relapse at each assessment point.

Method

Participants. The subjects were 528 patients with schizophrenia-spectrum disorders who were participants in the Treatment Strategies in Schizophrenia (TSS) study (Schooler et al. 1997). The TSS study was a large, multicenter clinical trial examining the efficacy of family intervention and medication maintenance dosage strategies in a randomized controlled trial. Patients were recruited following a symptom exacerbation and medicated with fluphenazine decanoate (FPZ) and supplemental medications during a stabilization period usually lasting 3 to 6 months. At baseline, patients were randomized to one of two family therapy conditions: supportive family treatment (monthly multiple family groups for approximately 2.5 years) or applied family treatment (behavioral family therapy for approximately 1.5 years plus concurrent monthly multiple family groups for approximately 2.5 years). At the end of stabilization, patients were randomly assigned to one of the three medication dosage groups administered in a double-blind fashion: standard dose FPZ, low dose FPZ (one-fifth the potency of standard dose), or targeted dose (i.e., placebo). Regardless of which medication dosage group patients were assigned to, psychiatrists were free to prescribe open-label FPZ if the early warning signs of a relapse appeared or an actual relapse occurred. If patients were prescribed more than 140 days of open-label FPZ during 1 year of the 2-year double-blind part of the study, they stopped receiving the double-blind medication, but continued to receive family intervention. Comprehensive assessments were conducted at baseline, at entry to double blind (i.e., end of stabilization period), and at 1 and 2 years later.

Inclusion criteria included a diagnosis of schizophrenia, schizoaffective disorder, or schizophreniform disorder based on the Structured Clinical Interview for *DSM–III–R* (Spitzer et al. 1988); age between 18 and 55; willingness to take FPZ injections and not to receive other major psychotropic medications; contact with family of origin or legal guardian at least 4 hours per week; willingness to give written informed consent for both the medication and family intervention aspects of the study and at least one relative willing to participate in family intervention; and psychiatric hospitalization or symptom exacerbation in the past 3 months. Exclusion criteria included current or recent (past 3 months) physical dependence on alcohol, stimulants, barbiturates, or narcotics; current hospitalization precipitated by alcohol or drug abuse; current pregnancy; or epilepsy or organic brain syndrome. Demographic, family, and clinical characteristics of the sample are summarized in table 1.

Measures. We chose several sets of predictors from the comprehensive battery of assessments administered in the TSS study.

Brief Psychiatric Rating Scale (BPRS; Overall and Gorham 1962). The anchored version of the BPRS (Woerner et al. 1988) was used to rate symptoms for the previous week, using behavioral anchors on a 7-point

Table 1. Sample characteristics at baseline

Characteristic	Mean	SD	Min	Max	*n*
Patient background variables					
Age (yrs)	29.6	7.4	18.0	55.0	313
Gender, no. male (%)	207 (66.1%)				313
Race, no. (%)					313
White	124 (39.6%)				
Black	157 (50.2%)				
Asian	5 (1.6%)				
Hispanic	10 (3.2%)				
Other	17 (5.4%)				
Marital status, no. (%)					313
Married	12 (3.8%)				
Widowed, divorced, or separated	45 (14.4%)				
Never married	256 (81.8%)				
Patient educational level[1]	4.2	1.1	0.0	7.0	313
Other language in home, no. (%)	54 (17.3%)				313
Diagnosis, no. (%)					313
Schizophrenia	249 (79.6%)				
Schizoaffective	41 (13.1%)				
Schizophreniform	23 (7.3%)				
Family SES					
Mother's education[1]	3.9	1.5	0.0	8.0	304
Father's education[1]	3.9	1.8	0.0	8.0	277
Mother's occupational level[2]	2.9	1.9	0.0	7.0	300
Father's occupational level[2]	3.5	1.8	0.0	7.0	289
Family functioning					
Mother's functioning[3]	1.3	0.6	1.0	3.0	308
Father's functioning[3]	1.6	0.8	1.0	3.0	277
Mother's psychiatric history[4]	1.6	1.4	1.0	8.0	310
Father's psychiatric history[4]	1.5	1.3	1.0	7.0	294
Siblings' psychiatric history[4]	1.8	1.6	1.0	7.0	288
Premorbid functioning					
Age onset	21.1	5.7	1.0	40.0	311
Age last behaved like peers	18.8	6.8	1.0	40.0	313
Premorbid functioning[3]	1.6	0.7	1.0	3.0	313
Age first hospitalized	23.8	5.8	8.0	44.0	308
Behavior problems as a child, no. (%)	80 (25.6%)				312
Hospitalization history					
Months hospitalized lifetime	5.5	12.2	0.0	125.0	313
No. hospital admissions in previous 2 yrs	0.8	1.2	0.0	6.0	311
Social functioning[5]					
Social leisure (Patient–SAS)	2.8	0.6	1.4	4.5	286
Interpersonal/family relations (Patient–SAS)	1.9	0.6	1.0	4.9	292
Romantic/sexual relations (Patient–SAS)	2.9	1.0	1.0	5.0	165

Table 1. Sample characteristics at baseline—Continued

Characteristic	Mean	SD	Min	Max	*n*
Self-efficacy (Patient–SAS)	2.0	0.5	1.1	3.3	292
Family burden (Family–SAS)	2.2	0.6	1.0	4.1	279
Social leisure (Family–SAS)	3.0	0.8	1.3	5.0	246
Self-care (Family–SAS)	1.9	0.8	0.9	4.8	278
Patient rejection (Patient Rejection Scale)[6]	59.2	21.0	25.0	135.0	271
Symptoms					
Affect (BPRS)[7]	2.0	0.7	1.0	4.6	295
Anergia (BPRS)[7]	2.1	0.7	1.0	5.1	298
Disorganization (BPRS)[7]	1.7	0.7	1.0	4.5	298
Thought disorder (BPRS)[7]	2.1	0.9	1.0	4.5	294
Diminished expression (SANS)[8]	2.1	0.8	1.0	4.4	250
Inattention-alogia (SANS)[8]	1.6	0.5	1.0	3.1	250
Social amotivation (SANS)[8]	2.3	0.7	1.0	4.2	245

Note.—BPRS = Brief Psychiatric Rating Scale; Max = maximum; Min = minimum; SANS = Scale for the Assessment of Negative Symptoms; SAS = Social Adjustment Scale–II; SD = standard deviation; SES = socioeconomic status.
[1] Educational level ranged from 0 = no formal school to 8 = completed postgraduate training.
[2] Occupational level ranged from 0 = never worked to 7 = executive, professional.
[3] Functioning items ranged from 1 = very well to 3 = poorly.
[4] Psychiatric history ranged from 1 = no psychiatric history to 8 = chronic hospitalizations totaling 5 years or more.
[5] Patient– and Family–SAS scores ranged from 1 to 5, with higher numbers indicating poorer adjustment.
[6] Patient rejection ranged from 24 to 168, with higher numbers indicating more negative attitudes toward the patient.
[7] BPRS scores ranged from 1 = none to 7 = very severe.
[8] SANS scores range from 1 = none to 5 = severe.

scale. BPRS assessments were based on clinical interviews by the treating psychiatrist and were conducted every 4 weeks throughout the study or until patients were prescribed open-label FPZ for more than 140 days in a year during the 2-year double-blind period. Interrater reliability for the BPRS items was high, based on independent interviews conducted by separate raters (Mueser et al. 1997). Following Mueser et al. (1997), we used the four-factor model of the BPRS: Thought Disturbance, Anergia, Affect, and Disorganization. We computed the mean score at two time points, baseline and start of double blind, to provide a stable estimate of symptomatology over the stabilization period. Although *t* tests indicated significant reductions from the baseline assessment to double blind ($ps < 0.001$), symptoms were highly correlated across the two assessments (rs 0.42 to 0.47, $ps < 0.001$).

Scale for the Assessment of Negative Symptoms (SANS; Andreasen 1984). The SANS was administered during a clinical interview by a psychiatrist at baseline, double blind, year 1, and year 2. Interrater reliability was satisfactory for the SANS, based on multiple raters of videotaped SANS interviews (Mueser et al. 1994). We examined negative symptoms using the three-factor model identified by Sayers et al. (1996): Diminished Expression, Inattention-Alogia, and Social Amotivation. We deleted one item from the Social Amotivation scale that assesses lack of persistence at work so as not to confound the prediction of work. As with the BPRS, we used the mean of the baseline and double-blind ratings to measure negative symptoms during stabilization. As in the BPRS, the SANS factors decreased significantly from baseline to double blind ($p < 0.001$ for Diminished Expression and Inattention-Alogia, $p < 0.05$ for Social Amotivation), but were strongly correlated with each other (rs 0.41 to 0.52, $ps < 0.001$).

Social adjustment and work. Patient social adjustment was assessed from both the patient's and key relative's perspectives using modified versions of the Social Adjustment Scale–II (SAS; Schooler et al. 1978). The Patient– and Family–SAS were administered by trained research assistants at baseline and again at year 1 and year 2 after entry to double blind. Monthly conference calls to review issues related to SAS ratings and ensure standard administration of the instruments were conducted with the research assistants from all the sites. The Patient–SAS contains questions (scored yes/no) pertaining to current (past month) competitive employment, efforts to obtain competitive employment (e.g., read the classifieds, participate in a job interview), and involvement in other vocational activity (e.g., volunteer or sheltered work, participation in a vocational rehabilitation program). Information on specific types of "other" vocational activity was not obtained. The Patient–SAS also assesses sev-

eral domains of social adjustment, including instrumental role functioning, finances, family relations, extended family relations, social leisure, interpersonal relations, romantic involvement, sexual adjustment, and personal well-being. Items are rated on 5-point scales with 5 representing poorest adjustment. In order to decrease the number of variables, we conducted an exploratory factor analysis with principal axis extraction and varimax rotation on the Patient–SAS items. Instrumental role functioning and financial items were excluded because they relate directly to employment. Based on the scree plots and the interpretability of factor loadings, four factors were extracted, accounting for 28.4 percent of the total variance: Social Leisure, Interpersonal/Family Relations, Romantic/Sexual Relations, and Self-Efficacy.

The Family–SAS contains items tapping parallel domains of the Patient SAS. As with the Patient–SAS, we conducted an exploratory factor analysis with principal axis extraction and varimax rotation on the Family–SAS items. Three factors were extracted, accounting for 29.0 percent of the total variance: Family Burden, Social Leisure, and Self-Care.

In addition to the Patient–SAS and Family–SAS, the SAS–Interim Patient (SAS–IP), a shortened version of the SAS, was administered by the nurse on a monthly basis or until patients were prescribed open-label FPZ for more than 140 days in a year during the 2-year double-blind period. The SAS–IP contained one question about current employment, and the same probe questions for several of the SAS–Patient and SAS–Family areas. For this article, only the question on current employment was examined.

Patient rejection. Rejecting attitudes by key family members were assessed using the Patient Rejection Scale (Kreisman et al. 1988), which was administered following the Family–SAS. Items are rated on a 7-point scale, with higher scores indicating more negative family attitudes toward the patient.

Clinical interview domains. In addition to the aforementioned scales, we examined several items from the baseline clinical interview. We grouped these items into five clinical and historical domains. *Patient background variables* included age, gender, race, marital status, patient educational level, language other than English spoken in the home (1 = yes, 0 = no), and diagnosis (1 = schizophrenia, 0 = schizoaffective or schizophreniform). *Premorbid Functioning* included age of onset of illness, age the patient last behaved like peers, and age first hospitalized. In addition, a single item of premorbid functioning (1 = very well to 3 = poorly) and an item assessing the presence of behavioral problems as a child (1 = yes, 0 = no) were included. *Hospitalization History* included the number of months hospitalized prior to the index hospitalization and the number of admissions in the 2 years prior to index hospitalization. *Family Functioning* included ratings of functioning of both the mother and father (1 = very well to 3 = poorly) as well as family psychiatric history for the mother, father, and siblings (1 = no psychiatric history to 8 = chronic hospitalizations totaling 5 years or more). Finally, *Family Socioeconomic Status (SES)* included the education levels of both the mother and father rated on a 9-point anchored scale (0 = no schooling to 8 = completed postgraduate training), as well as the highest occupational levels achieved for the mother and father rated on an 8-point anchored scale (0 = never worked to 7 = executive, professional).

Work history. The baseline clinical interview included several items assessing aspects of work history, including number of hours per week at longest job, number of months working on longest job, highest occupational level and occupational level prior to study admission (0 = never worked to 7 = executive, professional), age first job began (1 = never, 2 = after age 20, 3 = during or before adolescence), and work status at baseline (1 = not employed, 2 = other vocational activity, 3 = competitively employed). We created an index to capture prior work history by computing the mean of the standardized z scores for all the items. Coefficient alpha for work history was 0.61 (n = 391).

Results

First, we compared dropouts during the stabilization period with patients who entered the double-blind part of the study. Second, we examined site differences in work history and competitive employment rates across the study. Third, we explored changes in work status, desire for work, and efforts to find work across the three assessment points. Fourth, we evaluated whether desire for work and efforts to find work were related to changes in employment status over time. Fifth, we examined demographic, clinical, and social correlates of work history. Sixth, we evaluated the prospective prediction of work at the two followup assessments, based on demographics, history, and the baseline assessment. Last, we evaluated the associations between work status, current symptoms and functioning, and recent relapse.

Dropout Analyses. Although 528 participants began the study, only 313 completed the stabilization period and were randomized into the double-blind phase of the study. However, dropouts did not differ significantly ($p < 0.05$) on background characteristics of age, gender, race, marital status, or diagnosis. In addition, dropouts did not differ from those who entered double blind on work history scores, competitive employment rates at baseline, or desire to work at baseline. Dropouts did differ from those who entered double blind on several symptom dimensions. Dropouts had higher levels of Affect (means = 2.5,

2.2, $t[483] = 3.65$, $p < 0.001$), Disorganization (means = 2.2, 1.9, $t[486] = 2.88$, $p < 0.01$), and Thought Disorder (means = 3.0, 2.5, $t[480] = 3.90$, $p < 0.001$) on the BPRS, and lower levels of Diminished Expression (means = 2.1, 2.2, $t[428] = 2.07$, $p < 0.05$) on the SANS. The two groups did not differ on Anergia on the BPRS or on Inattention-Alogia or Social Amotivation on the SANS.

Site Differences in Work History and Competitive Employment. We evaluated site differences in work history by computing one-way analyses of variance (ANOVAs) on the work history index for both the total sample and the subgroup of patients who entered the double-blind part of the study. Both of these ANOVAs were significant: $F(4,480) = 5.91$, $p < 0.001$ and $F(4,304) = 3.09$, $p < 0.05$, respectively. Tukey's HSD tests indicated that, for both samples, Hillside Hospital and Payne Whitney Clinic had significantly higher work histories than the other sites.

To explore site differences in employment status across the study, we computed chi-square tests at baseline (both for the total sample and for only patients who entered the double-blind part of the study), year 1, and year 2. The employment rates and chi-square tests are summarized in table 2. At baseline there were no differences between sites in employment rates, whereas at years 1 and 2 there were significant differences. These differences reflected higher rates of employment at the followups at Payne Whitney Clinic and Hillside Hospital, and lower rates at Grady Memorial Hospital and San Francisco General Hospital. In order to control for site differences, site was included in all analyses that examined patient correlates and predictors of work.

Work Across Time. We examined competitive employment rates, interest in working, and changes in these variables from baseline to year 1 and year 2. We also examined labor force participation and unemployment rates. Competitive employment rates, interest in work, and efforts to find work did not differ between men and women. Therefore, the results are presented in table 3 combined across gender. To facilitate comparison across the different assessments, only data on patients who entered double blind are presented.

Changes in Employment and Desire for Work. Overall, competitive employment rates increased significantly from baseline to both year 1 and year 2. These increases were paralleled by significant decreases in unemployment. Labor force participation rates increased

Table 2. Site differences in employment at baseline, year 1, and year 2[1]

	Hillside Long Island	EPPI Philadelphia	Payne Whitney New York City	San Francisco General Hospital	Grady Atlanta	Total
Baseline (total sample)						
Comp. emp.	8 (11.8%)	9 (10.6%)	7 (10.9%)	6 (6.8%)	9 (8.9%)	39 (9.6%)
Other voc.	6 (8.8%)	4 (4.7%)	5 (7.8%)	2 (2.3%)	7 (6.9%)	24 (5.9%)
Not emp.	54 (79.4%)	72 (84.7%)	52 (81.3%)	80 (90.9%)	85 (84.2%)	343 (84.5%)
Baseline (only those who entered double blind)						
Comp. emp.	7 (14.6%)	8 (13.6%)	3 (6.4%)	5 (8.8%)	4 (5.9%)	27 (9.7%)
Other voc.	5 (10.4%)	3 (5.1%)	5 (10.6%)	2 (3.5%)	4 (5.9%)	19 (6.8%)
Not emp.	36 (75.0%)	48 (81.4%)	39 (83.0%)	50 (87.7%)	60 (88.2%)	233 (83.5%)
Year 1						
Comp. emp	14 (33.3%)	13 (23.2%)	21 (46.7%)	4 (7.5%)	9 (13.6%)	61 (23.3%)
Other voc.	7 (16.7%)	4 (7.1%)	4 (8.9%)	7 (13.2%)	2 (3.0%)	24 (9.2%)
Not emp.	21 (50.0%)	39 (69.6%)	20 (44.4%)	42 (79.2%)	55 (83.3%)	177 (67.6%)
Year 2						
Comp. emp	11 (26.8%)	13 (23.6%)	19 (36.5%)	6 (12.8%)	6 (9.0%)	55 (21.0%)
Other voc.	7 (17.1%)	3 (5.5%)	8 (15.4%)	6 (12.8%)	9 (13.4%)	33 (12.6%)
Not emp.	23 (56.1%)	39 (70.9%)	25 (48.1%)	35 (74.5%)	52 (77.6%)	174 (66.4%)

Note.—Comp. emp. = competitively employed; EPPI = Eastern Pennsylvania Psychiatric Institute; Not emp. = not employed; Other voc. = engaged in other vocational activity.

[1] Tests of significance between sites as follows: Baseline $\chi^2 = 5.74$, *ns* (total sample); baseline $\chi^2 = 7.64$, *ns* (only those who entered double blind); year 1 $\chi^2 = 36.17$, $p < 0.001$; year 2 $\chi^2 = 21.40$, $p < 0.01$.

Table 3. Work status and interest in employment

	Baseline (n = 279)	Year 1 (n = 262)	Year 2 (n = 262)	McNemar B to Year 1	McNemar B to Year 2
Work status					
Competitively employed	27 (9.7%)	61 (23.3%)	55 (21.0%)	$\chi^2 = 16.98^*$	$\chi^2 = 11.50^*$
Other vocational activity[1]	19 (6.8%)	24 (9.2%)	33 (12.6%)	$\chi^2 = 0.78$	$\chi^2 = 4.45^{**}$
Not employed	233 (83.5%)	177 (67.6%)	174 (66.4%)	$\chi^2 = 16.83^*$	$\chi^2 = 17.55^*$
Desire to work among those not employed[2]	(n = 226)	(n = 178)	(n = 172)		
Wants work, efforts to find work	55 (24.3%)	49 (27.5%)	41 (23.8%)	$\chi^2 = 0.66$	$\chi^2 = 0.04$
Wants work, no efforts	82 (36.3%)	45 (25.3%)	54 (31.4%)	$\chi^2 = 4.50^*$	$\chi^2 = 0.52$
Does not want work	89 (39.4%)	84 (47.2%)	77 (44.8%)	$\chi^2 = 1.69$	$\chi^2 = 1.11$
Labor force participation rate[3]	32.4%	46.0%	42.3%	$\chi^2 = 5.97^{**}$	$\chi^2 = 1.31$
Unemployment rate[4]	67.5%	44.5%	42.7%	Binomial $p < 0.05$	Binomial $p < 0.05$

Note.—B = baseline.
* $p < 0.001$; ** $p < 0.01$,
[1] Other vocational activity includes sheltered work, volunteer, vocational training, and casual labor.
[2] McNemar tests based on patients who were not employed at both time periods tested.
[3] Calculated as (a+d)/(a+d+e+f).
[4] Calculated as d/(a+d).

significantly from baseline to year 1, but the change from baseline to year 2 was not significant. Among patients who were not employed at both baseline and years 1 or 2, there were no significant changes in the proportion classified as no desire for work, desire but no efforts to find work, or desire for and efforts to find work.

We explored whether desire for work and efforts to find work at baseline were related to later employment by computing two McNemar tests. These findings are summarized in table 4. The chi-squares for both baseline to year 1 and baseline to year 2 were significant, indicating an association between desire for work and subsequent employment. Patients who expressed no desire to work at baseline were least likely to become employed, followed by patients who expressed a desire to work but had made no efforts to find work. Patients who both wanted to work and had made efforts to find work over the prior month were most likely to gain competitive employment, with 31 percent and 32 percent working at years 1 and 2, respectively.

Correlates of Work History. We conducted a series of stepwise multiple regressions to examine correlates of work history. Separate regressions were calculated for patient background variables, BPRS subscales, SANS subscales, Patient–SAS subscales, Family–SAS subscales, and indexes of premorbid functioning, of hospitalization history, of family functioning, and of family SES. In each regression, four dummy variables for site were included as possible correlates. Of the nine regressions, seven were significant ($p < 0.05$); BPRS scores and family SES did not correlate with work history. In all but one regression (the SANS), at least one of the site dummy variables was statistically significant.

Not surprisingly, the best set of correlates of work history was indexes of premorbid functioning. Together these variables accounted for 22 percent of the variance in work history; $F(5,464) = 26.49$, $p < 0.001$. Patients with an older age of illness onset, an older age at first hospitalization, and higher ratings of premorbid functioning were more likely to have worked. Background variables also were highly correlated with work history, accounting for 17 percent of the variance; $F(3,480) = 32.55$, $p < 0.001$. Patients who were older and had a higher educational level were most likely to have worked. Patient ratings of social adjustment also were strong predictors of work history accounting for 14 percent of the variance; $F(2,221) = 18.43$, $p < 0.001$. Patients with better Social Leisure adjustment were more likely to have worked.

The remaining sets of correlates each accounted for less than 10 percent of the variance in the work index. Variables that correlated with a higher work index included lower levels of Inattention-Alogia on the SANS, $F(1,240) = 10.04$, $p < 0.01$; lower Family Burden on the Family–SAS, $F(2,319) = 11.77$, $p < 0.001$; fewer hospital admissions, $F(4,475) = 7.52$, $p < 0.001$; and higher mother's functioning, $F(3,367) = 9.37$, $p < 0.001$.

Following the above analyses, we selected significant correlates from each of the regressions to be entered into a

Table 4. Desire to work and future competitive employment

Desire to work among those not employed at baseline	Year 1		Year 2	
	Not employed	Employed	Not employed	Employed
Wants work, efforts to find work[1]	34 (69.4%)	15 (30.6%)	34 (68.0%)	16 (32.0%)
Wants work, no efforts	56 (80.0%)	14 (20.0%)	57 (86.4%)	9 (13.6%)
Does not want work	66 (89.2%)	8 (10.8%)	64 (90.1%)	7 (9.9%)

Note.—Percentages based on rows.
* $p < 0.05$; ** $p < 0.01$
[1] Year 1 $\chi^2 = 7.51$*; year 2 $\chi^2 = 11.01$**

"winner take all" stepwise multiple regression of work history. Of ten possible correlates and four dummy variables for site, five entered into the equation, accounting for 27 percent of the variance in work history; $F(5,201) = 14.88$, $p < 0.001$. Better work history was most closely related to older age at first hospitalization, better SAS–Patient Social Leisure adjustment, higher educational level, lower levels of Inattention-Alogia on the SANS, and better premorbid functioning. Site was not a significant correlate. These results are summarized in table 5.

Prediction of Competitive Work. We chose to predict work status (working competitively or not working competitively) at years 1 and 2 (rather than using the monthly ratings of work based on the SAS–IP) because we had the most complete data on these annual followups. We focused on competitive work for two reasons. First, competitive work is widely recognized as an important goal of rehabilitation for schizophrenia. Second, a relatively small percentage of patients were engaged in "other" vocational activity.

Competitive work status reflects a snapshot of work activity (current work), rather than a cumulative measure of work. In order to determine whether work status at the two followup assessments was related to work activity throughout the previous year, we examined the relationship between competitive work at year 1 and year 2, and monthly ratings of work (working or not working) obtained by the nurse on the SAS–IP. For these analyses, we restricted the sample to patients who had at least 75 percent of SAS–IP ratings for each year of followup (for year 1, $n = 208$; for year 2, $n = 94$). For year 1, patients who were competitively employed had a mean of 6.9 (standard deviation [SD] = 3.9) months of work in the previous year, compared to patients who were not competitively employed with a mean of 1.5 (SD = 2.4); $t(206) = 9.45$, $p < 0.001$. For year 2, patients who were competitively employed had a mean of 9.0 (SD = 3.2) months of work in the previous year, compared to patients who were not competitively employed who had a mean of 1.8 (SD = 2.6); $t(92) = 10.79$, $p < 0.001$. Thus, months of work in the previous year was strongly related to competitive employment status at years 1 and 2.

Work status at year 1. Prior to examining predictors of competitive work, we evaluated whether treatment (medication condition, family treatment) or work history were related to later work. There were no differences in the percentage of patients competitively employed at year 1 by either medication dosage group ($\chi^2 = 0.28$, $df = 2$, $n = 262$) or family treatment group ($\chi^2 = 0.19$, $df = 1$, $n = 262$). There were significant differences in work history; patients who were competitively employed at year 1 had significantly higher work history scores (mean = 0.38, SD = 0.67) than those who were not competitively employed (mean = –0.01, SD = 0.49); $t(256) = 4.20$, $p < 0.001$.

In order to predict competitive employment at year 1 we conducted a series of stepwise logistic regression analyses using the same sets of predictors as above, as well as site. In order to determine whether controlling for prior work influenced the pattern of predictors, we computed separate regressions, both including work history as a covariate and without including it. When the work history was not included in the model, three of nine sets of predictors included variables that entered as significant ($p < 0.05$). Work at year 1 was predicted on the SANS by lower levels of Social Amotivation (Wald [W] = 6.48, $p < 0.01$), on the Patient–SAS by higher levels of Social Leisure adjustment ($W = 6.37$, $p < 0.05$), and on the Family–SAS by higher levels of patient Social Leisure adjustment ($W = 7.37$, $p < 0.01$) and better Self-Care adjustment ($W = 4.68$, $p < 0.05$). Patient background, BPRS subscales, premorbid functioning, family functioning, hospitalization history, and family SES did not predict competitive employment at year 1.

After controlling for work history, five of the nine sets of predictors were significant ($p < 0.05$). Lower levels of Social Amotivation (SANS, $W = 5.90$, $p < 0.05$) as well as fewer problems in both patient-rated Social Leisure (Patient–SAS, $W = 3.93$, $p < 0.05$) and family-rated Social Leisure (Family–SAS, $W = 9.19$, $p < 0.01$) predicted competitive employment at year 1. Higher levels of mother's

Table 5. Overall multiple regression for work index, controlling for site (free entry)[1]

Predictor	B	SE	Beta	Significance
Age first hospitalized	0.03	0.01	0.31	$p < 0.001$
Social leisure (Patient–SAS)	–0.24	0.06	–0.25	$p < 0.001$
Patient educational level	0.09	0.03	0.18	$p < 0.01$
Inattention-alogia	–0.14	0.07	–0.13	$p < 0.05$
Premorbid functioning	–0.10	0.05	–0.12	$p < 0.05$

Note.—B = beta weight in regression equation; beta = standardized beta weight; SAS = Social Adjustment Scale–II; SE = standard error.
[1] $R^2 = 0.27$, $F(5, 201) = 14.88$, $p < 0.001$

education (Family SES, $W = 8.27$, $p < 0.01$) and father's education ($W = 4.68$, $p < 0.05$) as well as the patient background variable of younger age ($W = 4.84$, $p < 0.05$) also predicted competitive employment. BPRS, premorbid functioning, hospital history, and family functioning did not predict competitive employment at year 1.

As with work history, we performed two overall stepwise logistic regressions with each of the individual items that included variables predictive in the previous analyses, one that did not include work history and a second that did include work history (both allowed site to enter freely). When work history was not included in the model, two variables were significant predictors of competitive employment at year 1: patient-rated Social Leisure and site. When work history was included in the model, three variables were significant predictors: work history, patient-rated Social Leisure, and mother's educational level. Site was no longer a significant predictor after controlling for work history. These findings are summarized in table 6.

Work status at year 2. Potential confounds were also examined at year 2. There were no differences in the percentage of patients competitively employed by family treatment group ($\chi^2 = 0.48$, $df = 1$, $n = 262$); differences on the basis of drug dosage group, however, approached significance ($\chi^2 = 5.10$, $df = 2$, $n = 262$, $p = 0.08$). Competitive employment rates for the dosage groups were 18 percent for standard dose, 16.3 percent for low dose, and 29.1 percent for targeted dose. Because dosage was marginally related to competitive employment work, analyses were reexamined with dosage group as a covariate; however, the inclusion of this covariate did not alter the results and are therefore not reported. Prior work history was a significant predictor of competitive employment at year 2. Patients who were competitively employed at year 2 had higher work history scores (mean = 0.43, SD = 0.62) than those who were not competitively employed (mean = –0.03, SD = 0.50); $t(1,256) = 5.08$, $p < 0.001$.

As with year 1, we performed stepwise logistic regressions to predict competitive employment at year 2 from the baseline predictor sets, both including and without including work history as a covariate. When the work history was not included in the model, six of nine sets of predictors contained significant variables. Lower levels of Inattention-Alogia ($W = 7.69$, $p < 0.01$) and Patient Rejection ($W = 6.19$, $p < 0.05$) and fewer problems in patient-rated Social Leisure ($W = 8.08$, $p < 0.01$) predicted work at year 2. In addition, patients who last behaved like peers at a later age ($W = 9.71$, $p < 0.01$), had higher levels of education ($W = 7.05$, $p < 0.01$), and had siblings with a better psychiatric history ($W = 3.84$, $p < 0.05$) were more likely to work at year 2. BPRS, hospitalization history, and Family SES did not predict employment at year 2.

After controlling for the work history, only three of the nine predictor sets were significant. Lower levels of Inattention-Alogia on the SANS ($W = 5.54$, $p < 0.05$), higher mother's educational level from Family SES items ($W = 5.59$, $p < 0.05$), and patient background variables of younger age ($W = 5.25$, $p < 0.05$) and higher educational level ($W = 6.37$, $p < 0.05$) each predicted competitive employment at year 2.

As with year 1, we performed two overall stepwise logistic regressions with each of the individual items that were significant in the previous analyses, one that did not include work history and a second that did include work history (both analyses included site as possible predictor variables). When work history was not included in the model, three variables were significant predictors of work at year 2: patient-rated Social Leisure, patient's education, and site. When work history was included in the model, three variables in addition to the work index significantly predicted work status: Inattention-Alogia on the SANS, mother's educational level, and patient's age; site did not enter the equation. These analyses are summarized in table 6.

Consistency of predictors. Table 7 summarizes the significant variables in the individual sets of multiple regressions that predicted work history and work at years 1 and 2 (e.g., SANS, Patient–SAS). Of the clinical variables, Inattention-Alogia was predictive at both baseline and

Table 6. Overall logistic regressions predicting competitive employment[1]

	Beta	SE	Wald	Significance	Odds Ratio
Year 1[2]					
Social leisure (patient)	−1.65	0.39	17.57	$p < 0.001$	0.19
Site			13.38	$p < 0.05$	
Site 3[3]	1.33	0.41	10.57	$p < 0.001$	3.77
Year 2[4]					
Social leisure (patient)	−1.23	0.38	10.50	$p < 0.01$	0.29
Patient education	0.45	0.22	4.36	$p < 0.05$	1.57
Site			9.19	$p = 0.06$	
Site 3[3]	1.10	0.40	7.46	$p < 0.01$	3.00
Controlling for Prior Work					
Year 1[5]					
Work history	0.98	0.45	4.59	$p < 0.05$	2.65
Social leisure (patient)	−1.26	0.41	9.28	$p < 0.01$	0.28
Mother's education	0.36	0.14	6.19	$p < 0.05$	1.43
Year 2[6]					
Work history	1.97	0.46	18.64	$p < 0.001$	7.16
Inattention-alogia	−1.02	0.52	3.80	$p < 0.05$	0.36
Mother's education	0.28	0.14	4.34	$p < 0.05$	1.33
Patient's age	−0.08	0.03	6.47	$p < 0.01$	0.92

Note.— SE = standard error.
[1] Controlling for site (free entry)
[2] $\chi^2 = 32.70$, $p < 0.001$, Pseudo $R^2 = 0.175$
[3] Payne-Whitney Clinic, New York, NY
[4] $\chi^2 = 27.72$, $p < 0.001$, Pseudo $R^2 = 0.157$
[5] $\chi^2 = 17.67$, $p < 0.001$, Pseudo $R^2 = 0.170$
[6] $\chi^2 = 18.79$, $p < 0.001$, Pseudo $R^2 = 0.184$

Table 7. Significant predictors of work[1]

				Controlling for Work Index	
Baseline Predictors	Baseline Work Index	Year 1	Year 2	Year 1	Year 2
Symptoms					
Inattention-alogia (SANS)	*		*		*
Social amotivation (SANS)		*		*	
Social functioning					
Social leisure (Patient–SAS)	*	*	*	*	
Social leisure (Family–SAS)		*		*	
Family burden (Family–SAS)	*				
Self-care (Family–SAS)		*			
Patient rejection (Patient Rejection Scale)			*		
Psychiatric history					
Age at onset	*				
Age last behaved like peers			*		
Age at first hospitalization	*				
Premorbid functioning	*				
No. hospitalizations in last 2 yrs	*				
Sociodemographic variables					
Age	*			*	*
Patient education	*		*		*
Mother's education				*	*
Mother's functioning	*				
Siblings' psychiatric history			*		
Father's education				*	

Note.—SANS = Scale for the Assessment of Negative Symptoms; SAS = Social Adjustment Scale–II.
[1] From regressions with independent sets of variables, controlling for site (free entry).

year 2 (even after controlling for baseline work index); Social Leisure as rated by patients was predictive of competitive employment at baseline, year 1, and year 2. Family ratings of Social Leisure were predictive at year 1, even after controlling for work history. Sociodemographic variables of age, patient education, and mother's education also were consistent predictors.

Correlates of Work. We evaluated whether work status at each of the three time points was associated with patient functioning by computing point-biserial correlations. These correlations are displayed in table 8. Significant correlates of work status closely paralleled the correlates of work history and predictors of work. These correlates included Social Leisure functioning, Self-Care, Family Burden, Patient Rejection, Disorganization, Inattention-Alogia, and Social Amotivation.

We also examined whether experiencing a recent relapse was related to work. We did not have complete data on psychopathology over the 2 years following randomization into the double-blind part of the study. However, we did have data on two outcomes related to relapse: whether the person was placed on open-label FPZ (to treat early warning signs of a relapse) and whether the person was hospitalized over the 2-year period. Among patients who were competitively employed at year 1, 46 percent had been placed on open-label FPZ over the past year, compared to 62 percent of persons who were not competitively employed ($\chi^2 = 4.79$, $p < 0.05$). During year 2, 20 percent of the competitively employed patients were put on open-label FPZ, compared to 18 percent of those not competitively employed ($\chi^2 = 0.08$, *ns*). Twenty percent of patients who were competitively employed at year 1 had been hospitalized over the previous year, compared with 29 percent of those not competitively employed ($\chi^2 = 2.02$, *ns*). At year 2, 16 percent of patients who were competitively employed had been hospitalized over the previous year, compared to 19 percent of those not competitively employed ($\chi^2 = 0.18$, *ns*). Thus, being placed on open-label FPZ was related to competitive employment at year 1, but not year 2, whereas recent hospitalizations were not significantly related to employment at either year. It should be noted that the rate of hospitalization was relatively low throughout the study.

Discussion

The competitive employment rates in this sample, ranging from about 10 percent following treatment for a symptom exacerbation to about 20 percent over the next 2 years, are similar to rates found in other surveys of persons with severe mental disorders (Anthony and Blanch 1987). Prior research has found that symptom exacerbations and rehospitalizations have a negative effect on employment and engagement in other vocational activities (Lorei and Gurel 1973; Strauss and Carpenter 1977; Blumenthal et al. 1988; Mowbray et al. 1995). The increase in both competitive employment and involvement in other vocational activity from the baseline assessment to the followup assessments suggests that the recent symptom exacerbation prior to baseline may have had a generally negative

Table 8. Cross-sectional point-biserial correlations with competitive employment

Variable	Baseline	Year 1	Year 2
Social functioning			
Social leisure (Patient–SAS)	–0.24*	–0.32*	–0.30*
Interpersonal/family relations (Patient–SAS)	–0.08	–0.07	–0.08
Romantic/sexual relations (Patient–SAS)	0.03	–0.07	–0.03
Self-efficacy (Patient–SAS)	0.01	–0.04	–0.14**
Family burden (Family–SAS)	–0.17*	–0.20***	–0.20***
Social leisure (Family–SAS)	–0.07	–0.14**	–0.12
Self-care (Family–SAS)	–0.10	–0.18***	–0.18***
Patient Rejection (Patient Rejection Scale)	–0.11**	–0.13	–0.16**
Symptoms			
Affect (BPRS)	0.04	–0.07	–0.09
Anergia (BPRS)	–0.04	–0.17***	–0.11
Disorganization (BPRS)	–0.10	–0.16**	–0.17***
Thought disorder (BPRS)	0.05	–0.13**	–0.05
Diminished expression (SANS)	–0.11	–0.15**	–0.08
Inattention-alogia (SANS)	–0.15**	–0.20*	–0.18***
Social amotivation (SANS)	–0.08	–0.19***	–0.14**

Note.—BPRS = Brief Psychiatric Rating Scale; SANS = Scale for the Assessment of Negative Symptoms; SAS = Social Adjustment Scale–II.
* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

effect on work orientation, which subsequently increased over the following 2 years as symptoms stabilized. These results are also consistent with the finding that patients who were competitively employed at year 1 were less likely to have been placed on open-label FPZ (for treatment of early warning signs of a relapse) over the previous year than patients who were not competitively employed. Most patients were no longer on the double-blind medication by the second year of the study, so there were no differences between employed and unemployed patients in being put on open-label FPZ.

Few data exist on the desire for work among persons with schizophrenia or their efforts to find employment. Across the three assessment points, there was a fairly stable proportion of patients who expressed a desire for work, ranging between 53 percent and 61 percent, somewhat lower than the 70 percent figure reported by Rogers et al. (1991), who studied a heterogeneous group of psychiatric diagnoses. Among those desiring work, approximately half had made efforts over the past month to find employment. The distinction between actively seeking employment and passive interest in work appears to be important. Patients who at baseline were looking for work over the past month were more likely to be employed at the followup assessments, with employment rates over 30 percent, compared to patients who were not actively seeking work, whose employment rates at followup ranged between 9 percent and 20 percent. This is consistent with studies in the general population that have found that unemployed individuals (i.e., those actively seeking work) are more likely to become employed than are those classified as out of the labor force (Flinn and Heckman 1983; Tano 1991; Gönül 1992).

Prior work history was related to history of the illness, including premorbid functioning, age at onset of schizophrenia, age at first hospitalization, and number of hospitalizations over the past 2 years. These findings are in general agreement with other research showing an association between work and premorbid functioning, age at onset of illness, and hospitalizations (Strauss and Carpenter 1977; Harrow et al. 1986; MacEwan and Athawes 1997). Similarly, the relationships between work history and social functioning, cognitive impairment, and patient education are also consistent with prior research (Klorman et al. 1977; Avison and Speechley 1987; Liddle 1987; Hoffman and Kupper 1997).

Most research on the prospective prediction of work has examined the contributions of sociodemographic and clinical variables without controlling for work history. As prior work is a potent predictor of future work (Carpenter and Strauss 1991; Arns and Linney 1995; Drake et al. 1996), the predictive utility of other variables is unclear. We found that similar variables predicted competitive work at the followups both when work history was statistically controlled and when it was not. In line with other research on schizophrenia (Lorei and Gurel 1973; Huber et al. 1975; Daradkeh and Karim 1994; Geddes et al. 1994; Arns and Linney 1995), patient educational attainment and Family SES were important predictors of later competitive work. Educational level may be especially important considering that the onset of psychiatric disorders is associated with truncated educational attainment (Kessler et al. 1995). Level of education may be predictive of work for several reasons. Lower levels of education may reflect an earlier age at onset of schizophrenia, which is predictive of a worse course of illness, including poorer work functioning (see previous paragraph). Patients with less education may also have fewer marketable skills, making it more difficult to obtain competitive jobs, and they may have fewer informal contacts who can provide useful job leads. More than one of these explanations is possible.

A second set of predictors of work was cognitive impairment, reflected by the Inattention-Alogia subscale on the SANS. Several other studies suggest that cognitive impairment predicts work functioning in schizophrenia (Lysaker et al. 1995; Hoffman and Kupper 1997; Bryson et al. 1998; Nuechterlein et al. 1998; Suslow et al. 2000). The relationship between cognitive functioning and future work is in line with the general model of social competence in schizophrenia that links cognitive deficits to impaired social and role functioning (Wallace et al. 1980; Brenner et al. 1992; Penn et al. 1995). Cognitive ability is known to be related to paid work in the general population, even after family background and education are controlled (Herrnstein and Murray 1994). Considering the prominence of cognitive deficits in schizophrenia (Green 1996), the relationship between cognitive functioning and work may partly explain why employment rates are so low in this disorder.

A third set of predictors of work was social and leisure functioning. Similar to cognitive functioning, social functioning has frequently been reported in prior research to predict work in schizophrenia (Strauss and Carpenter 1974, 1977; Breier et al. 1991; Jonsson and Nyman 1991; Arns and Linney 1995; Hoffman and Kupper 1997), although such research has not controlled for the effects of work history. There are several reasons why social functioning may be such a potent predictor of employment. Social competence, which is associated with work performance in schizophrenia (Jackson et al. 1989; Bellack et al. 1990; Massel et al. 1990), may help in securing and maintaining jobs (Mueser et al. 1986; Wallace et al. 1999). Alternatively, social and leisure functioning may reflect a core motivational characteristic often impaired in schizophrenia, with the same patients who are motivated by social contact and leisure activities also more interested in work. Anhedonia and other nega-

tive symptoms are related to both social functioning (Jackson et al. 1989; Mueser et al. 1990; Blanchard et al. 1994) and work (Pogue-Geile and Harrow 1985; Breier et al. 1991; Kay and Murrill 1990; Suslow et al. 2000). In the present study, Social Amotivation on the SANS predicted work at years 1 and 2. The assessment of social relationships and leisure activities on the SAS may yield a more sensitive measure of hedonic capacity than more direct questioning about enjoyment on the SANS.

When all of the predictors of work at years 1 and 2 were examined simultaneously (table 6), patient self-reported social and leisure functioning was the most consistent predictor (significant in three of the four final models). Mother's education was predictive of work in two models, with patient education predictive in a third model. Although these findings need to be replicated, the significance of the overall prediction models and the heterogeneity of the sample, including patients from five different treatment centers throughout the United States recruited and assessed over approximately 8 years, suggests these unique predictors are robust.

These findings may have potentially important implications for vocational rehabilitation in persons with schizophrenia. Although there is growing evidence that supported employment methods can improve rates of competitive employment in patients with schizophrenia (Bond et al. 1997), many patients express no interest in working, and many others work little or not at all in these programs (Drake et al. 1999). The present study suggests that improving patients' educational levels, remediating or teaching compensatory skills for cognitive impairments, and addressing basic impairments in social competence and functioning may improve the employment outcomes of patients who fail to benefit from supported employment programs or who express no interest in work.

Several caveats regarding this study need to be acknowledged. First, as this sample was drawn from a study of family treatment that required patients to be in contact with a member of the family of origin who also had to be willing to participate in the study, the findings may not be generalizable to patients not in contact with relatives. The strength of mother's level of education as a predictor of work appears due in part to the family nature of the study, which required contact with family members, usually mothers. Second, only a crude measure of employment was used that was not verified by independent accounts, although psychiatric patients' self-report of current employment status have been found to be reliable (Clark et al. 1998). Third, although the sample was heterogeneous in race and gender, all patients were living in urban areas and had recently experienced a symptom relapse. Fourth, clients who were physically dependent upon alcohol or drugs were excluded from the study. Of the 6,012 patients screened for this study, 7 percent were excluded for physical dependence on alcohol or drugs and 2 percent were excluded for current drug-related psychosis (Robinson et al. 1996). These exclusion criteria suggest that the findings reported here may not generalize to patients with schizophrenia and severe substance use disorders. Despite these limitations, the findings suggest that educational level (or more general socioeconomic factors), cognitive impairment, and social functioning are important predictors of work in schizophrenia. Interventions may need to address these specific areas in order to improve long-term employment outcomes for patients with schizophrenia.

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