

Vocational Rehabilitation for Persons With Schizophrenia: Recent Research and Implications for Practice

by Judith A. Cook and Lisa Razzano

Abstract

This article presents research-based principles of vocational rehabilitation that have emerged from the study of diagnostically heterogeneous populations of persons with severe mental illness. Employment and vocational functioning outcomes of people with schizophrenia from recently published followup studies are described. In addition, we present research conducted over the past decade concerning differential outcomes of vocational rehabilitation services for people with schizophrenia versus other psychotic and nonpsychotic disorders. We then explore studies of people with schizophrenia that may illuminate the links between specific features of this disorder—including symptomatology, social skills, and neuropsychological impairments—and poorer vocational outcome. We conclude with a set of recommendations for clinical practice that draw upon the most recent discoveries and insights in this field.

Keywords: Employment, vocational rehabilitation, work outcomes, social skills, neuropsychological impairment.

Schizophrenia Bulletin, 26(1):87–103, 2000.

After years of benign neglect by professionals in the fields of mental health and rehabilitation (Ruffner 1986), vocational rehabilitation of individuals with severe mental illness has become the focus of serious attention at the end of the 20th century (Cook and Pickett 1995). Several developments have opened a wider range of employment opportunities to persons with psychiatric disabilities. New drug regimens are effective for many affected workers, although they are not without troublesome side effects and social costs (Rutman 1994). In addition, we now know more about how to develop jobs and provide effective employment supports (Bond et al. 1997). Recent legislation, moreover, includes the Americans With Disabilities Act, which mandates fair hiring practices and reasonable accommodations for workers with psychiatric

disabilities (U.S. Department of Justice 1998). New Federal initiatives such as the President's Task Force on Employment of Adults With Disabilities and passage of the Ticket to Work and Work Incentives Improvement Act, Public Law 106-170 (1999) (which removes a series of financial and health coverage disincentives to employment among people with disabilities and provides them with vouchers for purchasing employment services directly from rehabilitation providers), point to the value our society is now placing on employment of its citizens with disabilities. Along with these developments, mental health activism and training in self-advocacy and legal protections (Cook and Wright 1995) have promoted employment of a wider and wider range of clientele.

Despite these advances, a review of the available evidence suggests that people with schizophrenia may not have benefited as much from them as have those with other psychiatric disorders. Followup studies of cohorts with schizophrenia have found that they experience low levels of employment and vocational functioning for many years after the onset of their illnesses. Additional evidence suggests that vocational rehabilitation interventions do not work as well for individuals with schizophrenia as they do for those with other psychiatric disorders. Finally, it appears that large proportions of people with schizophrenia do not have vocational services included in their treatment plans and do not receive vocational rehabilitation services concordant with standards of good clinical practice (Lehman and Steinwachs 1998a).

This article begins by presenting a series of principles of vocational rehabilitation that have emerged from the study of diagnostically heterogeneous populations of persons with severe mental illness. Next, we describe employment and vocational functioning outcomes of people with schizophrenia from recently published followup studies (1989 and later). Following that, we present

Reprint requests should be sent to Prof. J.A. Cook, Mental Health Services Research Program, Dept. of Psychiatry, University of Illinois at Chicago, 104 S. Michigan Ave., Ste. 900, Chicago IL 60603.

research conducted over the past decade concerning differential outcomes of vocational rehabilitation services for people with schizophrenia versus other psychotic and nonpsychotic disorders. This article then explores studies that may illuminate the links between specific features of schizophrenia—including symptomatology, social skills, and neuropsychological impairments—and poorer vocational outcomes. Finally, we conclude with a set of recommendations for clinical practice that draw upon the most recent discoveries and insights in this field.

Wherever possible, we focus on paid employment as a preferred outcome measure of vocational rehabilitation. But since the literature in this area is scarce, we also review studies in which work skills rather than employment per se were measured, and where assessment of productive work included those who were homemakers, students, or volunteers. We do this to explore suggestive evidence of associations and relationships that might lead in new directions for treatment and career recovery.

Methodology Used in Review of the Literature

Our review covered publications in the years 1989–1999. A primary inclusion criterion was that the research presented findings specifically for people who were diagnosed with schizophrenia or schizophrenia-spectrum disorders, or that the research compared them to other diagnostic groups. In addition, we required that the study report data on employment or vocational outcomes that were (1) indicators of paid employment (e.g., work for wages); (2) proportional measures of the amount of consumers who attained employment overall (e.g., percentage of service recipients employed vs. unemployed); (3) scores on valid, reliable measures of the amount of productive work performed, including homemaking and education as productive work along with paid employment (e.g., the work functioning measure of Strauss and Carpenter 1972); or (4) scores on measures of work-related skills, performance, or demeanor administered during a paid or unpaid assessment period (e.g., the Work Behavior Scale of Griffiths 1974).

With these criteria as guidelines, computerized searches were completed on three databases: Ovid for years 1993–1999, Medline for years 1989–1999, and Psychinfo from 1989–1999 for keywords and topical issues related to employment and vocational outcomes (as defined above) for people with schizophrenia. In addition, 20 specific journals were identified and individually searched in the above data bases for studies that met inclusion criteria. Journals searched were (alphabetically) *Acta Psychiatrica Scandinavica*, *American Journal of Psychiatry*, *Archives of*

General Psychiatry, *British Journal of Psychiatry*, *Community Mental Health Journal*, *European Archives of Psychiatry and Clinical Neuroscience*, *International Journal of Social Psychiatry*, *Journal of the American Medical Association*, *Journal of Consulting and Clinical Psychology*, *Journal of Counseling Psychology*, *Journal of Nervous and Mental Diseases*, *Psychiatric Rehabilitation Journal* (formerly *Psychosocial Rehabilitation Journal*), *Psychiatric Services* (formerly *Hospital and Community Psychiatry*), *Psychiatry Research*, *Psychological Medicine*, *Rehabilitation Counseling Bulletin*, *Rehabilitation Psychology*, *Schizophrenia Bulletin*, *Social Psychiatry*, and *Social Psychiatry and Psychiatric Epidemiology*. Additional general bibliographic searches yielded studies that, while not published in the 20 targeted journals, were reviewed with respect to the inclusion criteria and their appropriateness for the present paper. These additional sources included (alphabetically) *Behavioral Medicine*, *Comprehensive Psychiatry*, *Lancet*, *Journal of Behavioral Medicine*, and *Psychiatry Clinics of North America*.

Research-Based Principles of Vocational Rehabilitation for Psychiatric Disability

A series of principles has emerged from the research literature on heterogeneous groups of people with severe mental illness, and there is some consensus among experts about what works well for notable proportions of people. Many of these principles are borrowed from the field of multidisability vocational rehabilitation, and others have emerged from efforts to meet the unique needs of people with psychiatric disabilities. In this section, we review these principles and cite research supporting them to provide the reader with a general understanding of currently endorsed best practices in vocational rehabilitation with diagnostically heterogeneous psychiatric rehabilitation populations. No attempt has been made in this section to be exhaustive in presenting the literature since others have provided excellent reviews of this research (e.g., Lehman 1995; Bond et al. 1997).

The first principle is *use of situational assessment* in the evaluation of vocational skills and potential. Situational assessment is the longitudinal observation and rating of job behaviors and attitudes in actual or simulated work environments by a trained evaluator (Cook et al. 1994). Typical scales rate clients on aspects such as work quality (e.g., error rate) and quantity (e.g., percentage of industrial production rate), ability to perform specific work tasks (e.g., alphabetizing), work attitudes (e.g., work motivation), and interpersonal relations (e.g., interactions with supervisor and coworkers). This type of assessment recognizes that work behaviors and attitudes are a com-

plex constellation of factors that need to be assessed systematically in real-world environments (Massel et al. 1990). This approach takes into account the fact that accurate assessment of people with serious mental illness may be complicated by medication side effects, symptomatology, and cognitive impairments that accompany many types of mental illness (Cook and Pickett 1995). Since people with psychiatric disorders perform differently in different environments (Schultheis and Bond 1993), situation-specific assessment is preferred over traditional psychiatric assessments (Anthony and Jansen 1984), or traditional vocational assessments designed for people with physical disabilities or mental retardation (Cook and Razzano 1994). In one study (Rogers et al. 1997), ratings from a situational assessment of work behaviors of 275 psychosocial-rehabilitation clients significantly predicted employment status at 6-month followup, even when controlling for symptoms, diagnosis, race, living arrangement, and lifetime hospitalizations. In addition, several correlational studies have found that situational assessment scores are related at the zero-order level to later employment (Black 1986). A study of youths (late teens and early twenties) with severe mental illness (Cook 1991) found that a 23-item situational assessment predicted likelihood of employment and hourly wage at 6 months and 1 year after beginning a first job. Bond and Friedmeyer (1987) found that a 22-item checklist predicted total weeks worked and total earnings among 77 adults in a community-based psychosocial rehabilitation program. Other situational assessments have shown good reliability, discriminative validity, and content validity (Rogers et al. 1991a; Schultheis and Bond 1993).

The second principle involves offering clients *competitive or supported employment* rather than sheltered or unpaid work. Enactment of this principle means that clients are rehabilitated by being placed and trained in community jobs in integrated settings, earning minimum wage or above. Wehman and associates (Wehman and Moon 1988; Kregel et al. 1989) demonstrated convincingly that employment outcomes were significantly better for severely disabled individuals, including those with mental illness and mental retardation, when clients were rehabilitated through community placement into jobs at or above minimum wage in socially integrated settings. This followed a long line of research in the 1960s and 1970s suggesting the ineffectiveness of in-hospital work programs (Becker 1967; Walker et al. 1969) and segregated sheltered workshops (Whitehead 1977; Ciardiello 1981) for psychiatrically disabled populations. Drake et al. (1994) compared two different day programs that provided sheltered work to former psychiatric patients. The program that converted to a continuous supported-employment approach yielded superior competitive

employment outcomes compared with the sheltered work model.

Competitive employment appears to offer several rehabilitative advantages over sheltered or volunteer work. Work skills training that occurs in integrated environments alongside nondisabled coworkers offers clients positive role-modeling opportunities (Cook and Razzano 1992). Several surveys of people with psychiatric disabilities (Rogers et al. 1991b; Polak and Warner 1996) have shown that employment at or above minimum wage is preferred and offers obvious economic advantages to clients. The place-then-train approach provides on-the-job training that allows workers to learn skills in the same environments in which they will use them and helps prevent "transfer of training" difficulties, which can occur when skills are applied in different settings (Cook and Hoffschmidt 1993).

The third principle involves *rapid placement* into paid community employment versus undergoing a lengthy prevocational training period. This principle acknowledges the importance of swiftly placing clients into community jobs to avoid the demoralization that can accompany lengthy periods of job training and evaluation (Schultheis and Bond 1993). Bond and Dincin (1986) showed that clients randomly assigned to an "accelerated" (versus gradual) job placement model were more likely to be employed at 9-month followup and to be working full-time at 15-month followup. Another randomized study found that supported employment clients who were placed in jobs immediately (Bond et al. 1995) reported superior outcomes (higher employment rate, greater job satisfaction) than those receiving prevocational services prior to their first jobs. In a discriminant function analysis of 602 severely mentally ill clients following vocational rehabilitation, Cook and Razzano (1995) found that those who had worked in sheltered workshops were significantly less likely to achieve competitive employment even controlling for demographic factors (ethnicity, gender, education), functional impairment, illness severity, length of time receiving services, and the nature of employment services received.

A fourth principle involves the availability of *ongoing vocational support* appropriate to the individual's needs and situation. The continuous availability of vocational support following job placement is a hallmark of the supported employment model (Wehman 1988). The idea is that the relapsing and remitting nature of severe mental illness means that clients should not be completely terminated from vocational supports upon attainment of a job; the challenge is to avoid over- or underserving successfully employed clients (Cook and Razzano 1992). In one study of 550 outpatients who received vocational rehabilitation (Cook and Rosenberg 1994), a logistic

regression analysis predicting employment status at 6-month followup after program exit found that ongoing support was a significant factor even controlling for client demographic features (age, education, ethnicity), prior work history, degree of functional impairment, hospitalization history, length of time in treatment, and types of job supports received. In another study of a model program at the same agency (Cook and Razzano 1992), the addition of ongoing, as-needed employment support services was followed by an increase in the agencywide employment rate from 50 percent to above 80 percent throughout the 36-month program period.

Yet another principle is *tailoring job development and support to the client's individual preferences*. To some extent this principle grew out of a reaction against one-size-fits-all approaches in some service delivery models of vocational rehabilitation in which clients have little say over the nature of the jobs they are offered and the level of intrusiveness of the job support they receive (Danley et al. 1992; Mowbray et al. 1994). Instead, research shows that clients have better outcomes when their services are designed to coincide with their preferences. For example, Becker and associates (1996) found that 143 clients with severe mental illness who obtained jobs in their preferred fields had twice the job tenure of those not employed in their preferred area. The former group also reported significantly greater job satisfaction than those with jobs in nonpreferred fields.

One final principle involves explicit acknowledgment and planning regarding how changes in clients' work status can alter their disability income and associated health care coverage. This principle addresses potential *economic disincentives* to achieving certain levels of paid employment. Such disincentives are inherent in the way disability entitlements are structured (Noble 1998). In a study of vocational rehabilitation involving job-seeking skills training (Jacobs et al. 1992), recipients of Supplemental Security Income (SSI) were less likely to become employed or enter job training than nonrecipients; the authors linked this finding to the recipient group's poorer work histories and greater illness severity and chronicity. A multivariate study of 1,634 male Vietnam-era veterans (Rosenheck et al. 1995) found differences in likelihood and nature of employment according to the monthly payments the men were receiving. Veterans who received Department of Veteran's Affairs (VA) disability compensation payments of less than \$500 a month were no less likely to work or earn less money than those who received no disability income (and presumably had no disincentive). Even controlling for illness status, functional impairment, and traditional labor force predictors (ethnicity and education, for example), veterans whose compensation was greater than \$500 per month

were significantly less likely to work and earned significantly less than all groups of eligibles. Interestingly, however, veterans with psychiatric disabilities were no less likely to be employed than their disabled counterparts who had physical and other nonpsychiatric disabilities. While this research has yet to answer many questions about the relationship between disability payments and employment activity, it has highlighted to service providers the importance of benefits counseling and planning (Donegan and Palmer-Erbs 1998).

To summarize, at the end of the 20th century there is a body of research evidence to guide clinical practice in the vocational rehabilitation of people with severe mental illness. The foregoing set of service delivery principles appears repeatedly in published reviews on this topic, with slight variations (Mowbray et al. 1994; Cook and Pickett 1995; Lehman 1995; Bond et al. 1997). We know more about vocational outcomes than ever before; however, we have far less specific knowledge about schizophrenia and vocational rehabilitation as well as whether and how to tailor services for people with this diagnosis. To some extent, this is due to the relative recency of this field of research, which largely followed inauguration of the neuroleptic drug treatment era. This gap also results from an assumption widely held in the field of psychiatric vocational rehabilitation that diagnosis is not a central or even important factor in the ways services are designed and configured (Anthony and Jansen 1984). For many years now, the field of psychiatric disability has largely ignored clients' diagnoses in favor of attending to their functional impairments and how these impede rehabilitation success (Cook et al. 1996b). To address this uneven emphasis, we now turn to research exploring the nature of the direct or indirect relationships between diagnosis and vocational outcome.

Vocational Outcomes in Followup Studies of Cohorts With Schizophrenia

A number of studies have explored vocational outcomes among cohorts of people with schizophrenia following their release from an inpatient admission, often their *first* admission. These studies find low rates of employment at a number of time points and especially low proportions of individuals with full-time or continuous employment. In reviewing this literature, it is important to take account of historical variations in labor force participation, on the one hand, and the state of clinical and rehabilitative treatment, on the other hand. Patients released during periods when advanced neuroleptics were available and while effective vocational rehabilitation services were obtainable might be expected to have better outcomes than earlier, less well

treated clients (Weiden et al. 1996; Lindstroem and Lundberg 1997). Moreover, those seeking employment during periods of maximal labor force participation may be more successful than those looking for work during periods of high unemployment (Munk-Jorgenson and Mortensen 1992). Because of this, the cohort studies described below are presented in rough chronological order of followup year(s), along with either the corresponding national U.S. proportion of the adult population employed that year (Bureau of Labor Statistics 1999) or proportion of adult population in paid employment in selected European countries (Organisation for Economic Co-operation and Development 1997), as appropriate.

In a very long term followup study of the outcomes of Vermont inpatients with index hospitalizations during the mid-1950s who received comprehensive rehabilitation and who were discharged by the end of that decade (Harding et al. 1987; Harding 1999), 40 percent (excluding retired, elderly or widowed) of those judged to have *DSM-III* schizophrenia and 45 percent of those with *DSM-I* (but not *DSM-III*) schizophrenia were in paid employment at 20- to 25-year followup (the national proportion employed during the 1980–1982 data collection period was 57.8% to 59.2%). Breier et al. (1991) followed a cohort of 58 former inpatients with schizophrenia for an average of 6 years after an index admission during the 1970s and early 1980s. They found that 34 percent were employed (the national proportion employed during the 1986 followup year was 60.7% for the general population). Harrow et al. (1997) followed 74 Chicago inpatients with schizophrenia for a mean of 7.5 years after their index hospitalization in the late 1970s and early 1980s and found that less than 20 percent were employed (the national proportion employed during the years of this study's followup ranged from 57.8% to 59.9%). Munk-Jorgenson and Mortensen (1992) followed up 42 people in Denmark 13 years after their first hospitalization for schizophrenia (during 1972) and found that only 3 (7%) were doing paid work of any kind (the proportion employed in Denmark during the 1980s followup period ranged from 46.3% to 51.9%).

Other cohort studies use a "snapshot" design to explore employment among people with schizophrenia. For example, the Epidemiological Catchment Area (ECA) study found that people with schizophrenia were more than four times as likely to be unemployed as their psychiatrically healthy counterparts in the community (Keith et al. 1991). Using the ECA cohort in a study of days missed from work because of emotional problems, Kouzis and Eaton (1994) showed that people with schizophrenia had 18 times the odds of missing work for an emotional problem compared with their healthy counterparts. In another cohort study of people admitted for the first time

to 15 psychiatric facilities in the greater Baltimore, MD, area from 1983 through 1989 (Muntaner et al. 1993), 53 percent of those with schizophrenia were employed, while 66 percent of those with bipolar disorders and 75 percent of those with "other" psychotic disorders were employed (with the national proportion employed during 1983–1989 ranging from 57.9% to 62.9%); these differences were statistically significant even controlling for age, gender, marital status, socioeconomic status, and type of hospital to which they were first admitted.

A look at these studies by assessment year suggests no clear association with proportions in paid employment in the general adult population. The early 1980s Vermont cohort study found 40 percent employed, with a 57.8 to 59.2 percent proportion employed in the general population for the corresponding followup years. Two other studies found very low proportions in paid jobs (20% in the Chicago study; 7% in the Danish study) despite employed proportions of 57.8 to 59.9 percent and 46.3 to 51.9 percent in their national adult populations, respectively. Data gathered in the mid- to late 1980s found proportions such as 34 percent in a 1986 time period and 53 percent among those followed from 1983 to 1989, when proportions of national populations in paid employment were 60.7 percent and 57.9 to 62.9 percent, respectively. Overall, clear trends are not apparent in these findings, and it may be that regional employment proportions are a more sensitive and appropriate basis of comparison.

In another line of research, vocational outcome is operationalized in cohort studies by assigning ratings on ordinal scales to describe different levels of vocational performance, including student, volunteer, and homemaker status—a broader definition than labor force participation. One frequently used measure, the Strauss-Carpenter Scale, uses ratings of 0–4 to characterize the past year, where 0 = no useful work, 1 = "employed" less than half of the preceding year, 2 = "employed" full- or part-time more than half of the preceding year, 3 = "employed" more than half a year but less than continuously, and 4 = "employed" continuously (Strauss and Carpenter 1972). On these types of indicators, people with schizophrenia fare significantly worse than those with other diagnoses. For example, Tsuang and Coryell (1993) followed 22 patients with schizophrenia 8 years after hospitalization in the late 1970s and early 1980s and found that those with schizophrenia (as well as schizoaffective disorders) had significantly poorer Strauss-Carpenter employment functioning than those with psychotic depression. Harrow et al. (1997) found that people with schizophrenia had significantly poorer work functioning as gauged by the Strauss-Carpenter Scale than did those with other psychoses and nonpsychotic diagnoses. Johnstone and her colleagues (1990) followed 237 people with first episode schizophre-

nia 2 years after release from the hospital during the late 1970s and early 1980s and classified their occupational statuses as "same," "better," or "worse" using the Canadian Registrar Classification of Occupations. This study found that 58 percent showed a worsening of vocational status or had no occupation at illness onset. Another cohort study of 33 adults experiencing first episode of schizophrenia (Beiser et al. 1994) used a 95-point scale combining qualitative and quantitative aspects of work performance (the Blishen Index) and found that the cohort with schizophrenia had the worst job performance and asymptomatic individuals the best, with affective psychoses falling in-between. In this study, multivariate analysis identified three factors that predicted good outcome in the schizophrenia group: good premorbid job performance, being female, and higher scores on the presence of a genetic marker for schizophrenia.

One problem with single-indicator, categorical measures of employment outcome is that they mix information about employment status with information about amount and duration of employment. Another problem is the failure of many measures to distinguish between paid employment and other statuses. For example, Munk-Jorgensen and Mortensen (1992) found that of the eight respondents rated "continuously employed" or "employed 6 or more of the past 12 months," only three had actual wage-earning employment while the others were unpaid family workers, volunteers, students, or homemakers. The failure to gather and report data on standard labor force indicators such as employment status, hourly salary, job tenure, and hours worked per week has created unevenness in our knowledge about actual labor force participation and has prevented comparisons with data on the general population. Another difficulty with research in this field is the relative lack of appropriate statistical controls in many of the studies cited. This makes it difficult to determine whether differences in diagnosis alone account for differentially poorer vocational outcomes. Significant associations that appear causal may instead be spurious, with both variables related to some third unknown, causal factor. Small sample sizes further limit these studies' statistical power, and their use of nonrepresentative samples limits the generalizability of their results. However, even those studies using multivariate analysis with adequately sized samples have found that people with schizophrenia have poor employment and vocational outcomes in comparison to those with other disorders, including other psychotic disorders. Given this, we may ask whether or not this differential performance carries over into the realm of outcomes following receipt of vocational services. Thus, our next question is whether or not vocational rehabilitation interventions are as effective for people with schizophrenia as for people with other diagnoses.

Differential Outcomes of People With Schizophrenia Following Vocational Rehabilitation

Beginning in the 1960s, research evidence suggested that vocational rehabilitation success rates for people with schizophrenia were very low (Griffiths 1974). Large-scale studies ($n \geq 1000$) in the 1960s, 1970s, and 1980s showed that those with this diagnosis had poorer employment outcomes following receipt of vocational services (Veteran's Administration 1965; Dalton and Latz 1978; Ciardiello 1981). More recent literature suggests differentially negative outcome for clients with schizophrenia as well. Fabian's (1992) multivariate survival analysis of longitudinal outcomes for 90 clients in a supported employment program found that people with diagnoses of schizophrenia (and schizoaffective disorders) were significantly less likely to be employed at 12 months than those with major affective and personality disorders. In addition, members of ethnic and racial minority groups were significantly less likely to be employed than Caucasians. Unfortunately, most studies of vocational rehabilitation for people with schizophrenia do not address the specific influences of race and ethnicity, gender, social class, or other traditional labor force participation predictors. In a study by Jacobs and his colleagues (1992) of 89 psychiatrically disabled participants in a structured job-finding intervention, univariate analyses revealed that those with schizophrenia were less likely to obtain a job and were more likely to drop out of the intervention than those with all other diagnoses combined. Only 5 percent of those with schizophrenia found employment, compared to 18 percent of those with bipolar disorder, 40 percent with anxiety disorders, 50 percent with depression, and 36 percent with substance abuse disorders. In another univariate study of 500 psychiatrically disabled clients enrolled in State-funded vocational rehabilitation services (Marshak et al. 1990), diagnostic subgroup was found to be related to successful case closure, such that the proportion of successfully rehabilitated clients with psychotic disorders (46%) was significantly smaller than for those with severe depression or bipolar disorders (63%). In another study, anecdotal evidence suggested that, compared to those with personality disorders, persons with schizophrenia were less successful at paid work in inpatient settings and at volunteer community jobs (Evans et al. 1989).

Not all studies find more negative outcomes for persons with schizophrenia. A five-site study of 241 clients receiving supported employment services (Strong 1996) found that those with schizophrenia (and other psychotic disorders) were significantly *more likely* to be employed than those with affective disorders. However, the effect of diagnosis became nonsignificant when controlling for such client variables as gender, ethnicity, and education, as well

as SSI/SSDI (Social Security Disability Income) status and recent hospitalization. In another study, compared to persons with alcoholism, persons with schizophrenia were significantly more likely to participate successfully in a program in which they left the hospital each day to work at paid jobs in the community (McCarthy and Bewley 1980). Among a group of 143 vocational rehabilitation clientele receiving community job placements (Mueser et al. 1997), those with schizophrenia were no less likely to be employed when controlling for variables such as gender and type of service model used. In a group of 279 people receiving outpatient community treatment in programs such as Assertive Community Treatment, psychosocial clubhouses, and case management (Mowbray et al. 1995), people with schizophrenia were significantly less likely to be employed than those with other diagnoses; however, this difference became nonsignificant when other variables such as occurrence of recent hospitalization, functioning level, type of service provider, and degree of pride in working were controlled. Lysaker et al. (1993) found no differences in work skills such as task concentration, work motivation, work conformity, and personal presentation between clients with schizophrenia and those with physical and other nonpsychiatric disabilities.

In addition, ample evidence indicates that persons with schizophrenia do obtain employment while receiving vocational rehabilitation services. Among 65 unemployed individuals with schizophrenia who received clozapine, case management, and transitional employment placements (Littrell 1995), 57 percent were in some form of paid employment after 12 months. In a group of 83 unemployed people with schizophrenia who participated in work therapy in Germany (Reker and Eikelmann 1997), 48 percent were doing some paid work at 3-year followup: 22 percent were in the open labor market and 26 percent were in sheltered employment. Notable proportions of participants in the intensive Vermont rehabilitation program studied by Harding and her associates (Harding et al. 1987; Harding 1999) were working at 20- to 25-year followup.

In addition to their association with *paid work*, vocational services also appear to enhance *work functioning* among people with schizophrenia. In one study, clients with schizophrenia or schizoaffective disorders showed significant functional improvement following work skills training in comparison to controls who showed little change (Sauter and Nevid 1991). In another study of clients with schizophrenia, those in the paid condition worked more hours at subminimum-wage job placements and stayed in the program longer than their counterparts in the unpaid condition (Bell et al. 1986).

All in all, however, these studies indicate relatively modest success for vocational rehabilitation services

delivered to those with schizophrenia-spectrum disorders. Work outcomes are often in less-remunerative, less-desirable sheltered employment, and the amount of paid work is often minimal. Given these findings, we might ask ourselves why people with schizophrenia might need more vocational rehabilitation services or different types of services than people with other psychiatric disorders? If they can benefit from services, why do they sometimes not benefit equally? This leads us to the literature on three correlates of vocational performance among people with this disorder: symptoms, especially negative symptoms; social skills, particularly those related to negotiating the hiring process and getting along with coworkers; and neuropsychological impairments, namely those which influence cognitive processing, which then impacts on vocational performance.

Predictors of Employment for People With Schizophrenia

Symptoms and Vocational Outcomes Among People With Schizophrenia. Recent evidence indicates a persistent link between psychiatric symptoms and work functioning among people with schizophrenia. One study of 197 patients with schizophrenia (Fenton and McGlashan 1991) found that those with many negative symptoms had significantly poorer work function than did those with fewer negative symptoms. Lysaker and Bell's (1995) study of 50 mostly male veterans found a relationship between prominent negative symptoms and poor work performance on the Work Personality Profile (Bolton and Roessler 1986). Breier and associates (1991) found that increased negative symptoms between baseline and 6-year followup were significantly related to poorer work functioning at followup. Glynn and her associates (1992) studied 41 men with schizophrenia whose family members were randomly assigned to behavioral family therapy or customary care. They found that negative symptoms (as measured by the Scale for the Assessment of Negative Symptoms), especially affective flattening, avolition, and attentional impairment, were more strongly associated with work dysfunction than were other indexes of psychopathology (e.g., Brief Psychiatric Rating Scale measures of thought disturbance, hostile suspiciousness, and activation).

Echoing this research on schizophrenia, studies of diagnostically diverse groups (all of which had samples of 50% or more with schizophrenia and other psychotic disorders) indicate that higher levels of symptomatology are associated with poorer work performance on simulated work skills assessments (Massel et al. 1990) and with decreased likelihood of paid employment over time

(Anthony et al. 1995). One study (Rogers et al. 1997) followed 275 psychosocial rehabilitation clients from three agencies and found that, with symptoms controlled, a diagnosis of schizophrenia was no longer significant in predicting employment status. Symptoms, however, *did* remain a significant predictor along with race and clients' ratings on a situational assessment of their work behaviors. These findings suggested that it may not be the diagnosis of schizophrenia itself but the intensity and type of symptoms associated with this particular disorder that influence employment outcome and work performance.

Social Skills Deficits. Several research studies have shown a relationship between social skills deficits and poor vocational outcomes in schizophrenia. For example, the 2-year followup study by Johnstone et al. (1990) of people with schizophrenia found significantly poorer vocational outcomes for those with poorer overall social skills. In a study of simulated employment interviews conducted with 46 inpatients diagnosed with schizophrenia (Charisiou et al. 1989a), those rated higher on ability to communicate and overall social adjustment were more likely to be rated by independent judges as employable. Moreover, those rated high on negative symptoms had poorer interview skills, were rated as less employable, and were less likely to be referred to a job vacancy or to vocational rehabilitation services than those with lower levels of negative symptoms (Charisiou et al. 1989b). In a separate multivariate analysis of the same data (Solinski et al. 1992), better premorbid functioning and fewer negative symptoms predicted better microbehaviors that led to better interview performance and subsequent perception as "employable" by an independent rater. Similarly, Lysaker et al. (1993) studied people with a variety of disabilities employed in subminimum-wage sheltered jobs at a Veteran's Affairs medical center and found that those with schizophrenia (or schizoaffective disorder) were rated significantly lower than those with nonpsychiatric disabilities on social skills such as acting friendly and understanding coworkers' behavior and conducting workplace relationships. They also had more difficulty perceiving how their own behavior affected their coworkers.

Thus, several studies point to the connection between social skill deficits and poorer work and job interview skills as a place to focus further research attention. These findings also suggest that the development of social skills should be emphasized in models of vocational treatment planning for persons with schizophrenia (Dauwalder and Hoffmann 1992).

Cognitive Impairment and Vocational Functioning.

Evidence reviewed by Jaeger et al. (1992) indicates a high prevalence of neuropsychological deficits in schizophre-

nia; they point out that between 50 percent and 80 percent of people with this disorder can be classified as "brain damaged" using actuarial methods developed for neurological populations (Heaton and Crowley 1981; Seidman 1983). The level of neuropsychological impairment is more pronounced in schizophrenia than in affective disorders (Golden et al. 1983), suggesting a specific diagnostically related disadvantage. Dysfunction has been documented in a variety of domains, including executive functions associated with the frontal lobes (Goldberg et al. 1987), verbal performance controlled by the left hemisphere (Taylor et al. 1981), recall ability related to recognition memory and potentially tied to deficient encoding processes (Traupmann 1980), and a variety of motor functions (Manschreck 1983). Moreover, with the exception of neuromotor impairments, evidence suggests that neuropsychological deficits in schizophrenia *cannot* be explained by the presence, degree, or length of neuroleptic treatment, and that they persist even with successful management of psychopathological symptoms (Bilder et al. 1992).

A number of studies suggest that neuropsychological impairment may be related to vocational outcome in schizophrenia. One study of 84 men and 5 women with schizophrenia (Lysaker et al. 1995) found that even controlling for IQ and organicity, scores on the Wisconsin Card Sorting Test (WCST) (a measure of executive functions consisting of goal completion activities such as goal selection, planning, initiation of activity, self-regulation, and use of feedback) were significantly related to task orientation skills on the Work Personality Profile such as understanding work assignments and working persistently (i.e., staying on task). Also discovered was a link between WCST scores and social skills. However, while better WCST performance was related to higher vocational functioning, the obverse was not true: those who scored low on the WCST were as likely to perform well at work as they were to perform poorly. The authors speculate from these findings that people with schizophrenia may learn to compensate for their executive functioning deficits at work. Other researchers (Silverstein et al. 1991) have demonstrated associations between work dysfunction and impaired premorbid cognitive-perceptual functions (such as reading, arithmetic functions, and articulation of thoughts) among people with both schizophrenia and nonschizophrenia diagnoses. Brekke and his colleagues (1997) conducted a zero-order analysis of 40 persons with schizophrenia (and schizoaffective disorder) living in the community and found that better work functioning was associated with better complex visuo-spatial processing, a reflection of right parietal lobe functioning. A study of 87 mostly male veterans with schizophrenia or schizoaffective disorder in an outpatient rehabilitation

program found that verbal memory impairments (difficulties in encoding, retrieval, and recognition) predicted performance on the Work Behavior Inventory, especially work quality and work habits (Bryson et al. 1998). A multivariate analysis by van Os and his colleagues (1995) of 140 patients with "functional psychoses of recent onset" who had undergone computerized tomography scanning found a relationship between sylvian fissure volumes (a measure of cerebral atrophy) and poorer work function, even controlling for premorbid work performance and diagnosis (i.e., schizophrenia vs. depression).

What remains to be specified are the particular linkages between neuropsychological impairment and vocational functioning along with their causal nature. Jaeger and Douglas (1992), Silverstein and colleagues (1991), and van Os and his associates (1995) hypothesize that neurocognitive deficits may interfere with the ability to properly execute a wide variety of tasks required for successful work performance. If so, then information about the nature of these associations is of importance to the field of psychiatric vocational rehabilitation and needs to be accounted for in models of vocational rehabilitation for people with schizophrenia (Green 1996).

Taken together, the research on symptoms, social skills, and neuropsychological impairments highlights relationships between vocational outcomes and many of the unique features that characterize schizophrenia. These features include neuropsychiatric impairments leading to attention deficits and cognitive processing difficulties; positive symptoms such as hallucinations, delusions and thought disorders; and primary deficit symptoms such as lack of social interest, social withdrawal, and loss of motivation (Lehman 1995). Combining this knowledge with additional evidence from the clinical literature points to some unique needs of rehabilitation clientele with schizophrenia. We now turn our focus to those needs.

Implications for Clinical Practice

If the disability of mental illness is the "last frontier" (Ruffner 1986, p. 35) for the field of vocational rehabilitation, then perhaps it is fair to say that schizophrenia is the final frontier for the field of psychiatric vocational rehabilitation. Disciplinary assumptions and ideological tenets aside, rigorous field-based research is needed to determine whether the principles of effective vocational rehabilitation described earlier constitute best practice for people with this disorder. Do people with schizophrenia benefit equally from rapid job placement? Should all training be provided on-the-job, in real-world workplace settings? Are disincentives regarding benefits and entitlements magnified for this extremely economically vulnerable population? These questions must be asked, and

answered, if we are to include those with the most severe forms of psychiatric disability as full participants in vocational service delivery.

In designing rehabilitation programs for people with schizophrenia, especially chronic schizophrenia, we need multicausal, integrative, and process-oriented models of how the client interacts with his or her environment (Dauwalder and Hoffmann 1992). A "dynamic psychiatry" approach (Strauss 1989) is required to take into account the individual's illness course and coping strategies than have been learned over time.

A variety of social skills deficits accompany schizophrenia, and the field of social skills training has responded with interventions, many of which have been designed for persons with schizophrenia (Cook et al. 1996a). There is evidence that such training can lead to the acquisition of targeted skills (medication management, budgeting, and so forth), their generalization to real-world environments, and some degree of durability over time (Halford and Hayes 1991). Attention now should be turned to the development of workplace social skills training and to the application of some of the latest cognitive-behavioral therapy approaches (Stuve et al. 1991). Services should focus on helping clients with social skills deficits improve their abilities to interact with coworkers and handle social interactional challenges with coworkers and supervisors.

The ecological perspective suggested by Dauwalder and Hoffmann (1992) may be especially helpful here. In this framework, social behaviors related to chronicity, such as emotional withdrawal and reduction of interpersonal interaction, are viewed as secondary coping strategies that the individual has developed over time. While these are functional for the patient in some settings, they often are dysfunctional in the workplace. Thus, vocational rehabilitation in schizophrenia involves altering dysfunctional coping skills and improving overall coping ability while also reducing stressful environmental influences. Using principles of ecobehavioral dynamics, the clinical strategy involves attention to multiple realms (e.g., the patient's behavior, social network, and work situation) in helping clients reach vocational goals inherent in various stages of job seeking and actual employment. Also part of Dauwalder and Hoffmann's model (1992) is the idea of finding an "ecological niche," or a job where the patient's coworkers and supervisors will collaborate with the treatment team on behalf of the patient. Such an approach speaks to the need of patients whose social skills remain poor even following remediation. These principles echo the use of "natural supports" in the rehabilitation field, which has long involved employers, coworkers, family, and peers in rehabilitation efforts (Nisbet and Hagner 1988; Fabian and Luecking 1991; Callahan 1992). The

idea of altering the job and not just the worker is also inherent in the concept of reasonable accommodation as mandated by the Americans With Disabilities Act (Mancuso 1990), suggesting that this piece of legislation's support for job task and environment modifications may have particularly important uses for people with schizophrenia.

The relationship of symptoms to work performance suggests that all work aspirants must have continuous access to effective psychotropic medications and to appropriate, affordable, and "work-sensitive" medication management services. Since symptom relief appears paramount to an individual's ability to perform vocationally, careful coordination between the individual's prescribing psychiatrist and rehabilitation provider is called for. The importance of symptom management and its relation to employment underscores the need to fully integrate vocational and clinical services for people with schizophrenia (Chandler et al. 1997). This high level of integration is seen in approaches that combine transitional and supported employment with clinical services such as the Program of Assertive Community Treatment (PACT; Russert and Frey 1991), Individual Placement and Support (Drake and Becker 1996), and some clubhouse-style psychosocial rehabilitation programs (Cook and Razzano 1992). Having vocational and clinical service providers on the same treatment team can be essential to coordinating care for seriously impaired individuals (Knoedler 1994). This is especially the case given findings in two studies that being on neuroleptic medication was associated with poorer rather than better outcomes for people with schizophrenia. Johnstone and her colleagues (1990) found that those with better vocational functioning were more likely to be in the placebo rather than drug condition in her clinical trial of neuroleptic medication. These authors speculate on the possible social costs of maintenance neuroleptic treatment for people with schizophrenia. Harrow and colleagues (1997) found that a subgroup of their schizophrenia cohort had left the mental health treatment system after becoming discouraged or because they were in remission and chose to maintain their recovery without antipsychotic medications. At a mean 7.5 years after onset, just 69 percent of the schizophrenia cohort were receiving psychotropics and 58 percent were receiving neuroleptics. Those who were not receiving neuroleptic treatment had significantly better overall functioning than those who were. Those taking neuroleptic medications also reported higher symptom levels and poorer instrumental role functioning, pointing once again to the importance of coordinating clinical and rehabilitation services for this population.

Another aspect of vocational program design important for people with schizophrenia is recognition

of the demoralization that often accompanies schizophrenia. Hayes and Halford's (1996) study of time use of unemployed and employed single, male schizophrenia subjects found that being unemployed and having schizophrenia shared certain negative characteristics. These included lowered income, loss of an externally imposed time structure, absence of a valued social role, reduced social contact outside the family, and reduced opportunity to use valued skills and capabilities. The investigators argue for the necessity of distinguishing between negative symptoms and poor social functioning, and for understanding whether poor social abilities follow from negative symptoms or co-occur with them. They point to the distinction drawn by Carpenter et al. (1985) between the biologically based primary deficit symptoms intrinsic to schizophrenia and secondary transitory symptoms caused by depression, understimulating environments, and low self-esteem. Given that social dysfunction in schizophrenia can have different etiological bases (biological, psychological, social), care must be taken to offer the appropriate treatment when remediating social skills deficits.

Another concept in rehabilitation that may be viewed differently in the context of schizophrenia is work readiness. Here, also, negative symptoms such as physical anergia, abulia, anhedonia, and diminished sense of purpose can interfere with decision making and the planning necessary to begin vocational rehabilitation, complete a training program, and persist in the job search process (Lehman 1995). People with these kinds of symptoms may need additional support as they undergo the subjective experience of acquiring the desire to change. One study (Ferdinandi et al. 1998) of 39 outpatients with schizophrenia attending a day treatment program found that those who were able to express readiness to make a change were significantly more likely to be in paid employment 6 months later. Thus, a critical component of vocational rehabilitation for this group may be the cultivation and support of the individual's decision to seek employment. Knoedler (1994) makes this point when he notes that the PACT vocational model serves clients whether or not they are able to articulate a desire for competitive work.

Another important issue is that of access to vocational rehabilitation services for many people with schizophrenia. The recently published Schizophrenia Patient Outcomes Research Team treatment recommendations (Lehman and Steinwachs 1998b) assert that vocational rehabilitation services are appropriate for patients with the following characteristics: desire for competitive employment, history of prior competitive employment, minimal hospitalization history, and good work skills as evaluated through situational assessment. Nevertheless, a companion study (Lehman and

Steinwachs 1998a) of a stratified random sample of 719 persons diagnosed with schizophrenia in two States using data from medical record reviews and patient interviews indicated that only 22 percent of outpatients were receiving vocational rehabilitation services or had such services included in their treatment plans. The failure of vocational rehabilitation services to reach those psychiatrically disabled individuals most in need of them is a major policy issue that demands further attention (Noble 1998).

Convincing evidence of neurocognitive deficits in schizophrenia suggests that neuropsychological testing may be beneficial to those who provide vocational rehabilitation services to clients with schizophrenia (Malla et al. 1997). Such tests are essential to separate out the effects of neurocognitive and neuromotor impairments from the impact of symptomatology and side effects of neuroleptic medications. In addition, promising treatment approaches to cognitive remediation should be adapted to vocational rehabilitation. One example is Integrated Psychological Therapy (Brenner et al. 1992), which is based on the notion that, ultimately, social dysfunction is caused by cognitive deficits through two "vicious cycles" in which elementary cognitive deficits produce more complex cognitive dysfunctions. The more complex dysfunctions, in turn, diminish coping skills, increase social stressors, and subsequently further diminish cognitive and functional capacity. In this model, social skills deficits are the direct result of impairments in verbal communication that stem from limitations in social perception caused by cognitive deficits. A hierarchical model of remediation uses basic cognitive remediation exercises followed by training in social perception and interpersonal problem solving. The application of similar hierarchical models to work functioning and employment outcomes, such as those described by Jaeger and Douglas (1992) and Yozawitz (1986), offer promising directions for this field.

A final aspect of vocational rehabilitation for people with schizophrenia is an understanding of their degree of reliance on disability income and associated benefits, particularly health care and medication coverage. In a study of 48 individuals with schizophrenia followed for a mean of 5 years after their first hospitalization (Ho et al. 1997), 56 percent were primarily supported by SSI, SSDI, or Aid to Families With Dependent Children at 1-year post-discharge, and 72 percent relied on one or more of these public funding sources throughout much of the followup period. Given their high level of impoverishment (Cohen 1993), their dependence on public funding, and their greater likelihood of losing work days because of emotional illness (Kouzis and Eaton 1994), it is not surprising that people with schizophrenia make work decisions

by weighing the relative "costs" and "benefits" of paid work within their own individual economic and psychosocial contexts. For example, Polak and Warner (1996) surveyed 100 randomly selected clients with schizophrenia (and schizoaffective disorder) from a community mental health center. Only 10 percent of the clients said that they would work for minimum wage (then \$4.25 an hour), 41 percent were willing to work for \$5 an hour, and 57 percent would work for \$6 an hour. Of the 29 percent employed for at least 10 hours a week, the mean wage was \$4.60 an hour, confirming that rates of pay greater than minimum wage were needed to induce employment. An example from Polak and Warner's study illustrates how employment income lowers access to other benefits and entitlements:

One young man with schizophrenia took a job as a janitor for 20 hours a week and earned \$380 a month. As a result, his SSI income decreased by \$153 a month, his food stamps by \$35, and his rent subsidy by \$130. Although in the end he was only \$62 a month better off, to him, it seemed worthwhile because he felt more independent when working. (p. 272)

Every provider of vocational rehabilitation services must be cognizant of clients' individual situations regarding eligibility for disability income and how they are affected by employment. Frank discussion and sharing of accurate information are required so that clients can consider the relative advantages and disadvantages of different work options. This means that the alleviation of poverty is explicitly addressed as part of the rehabilitation process, including vocational rehabilitation (Ware and Goldfinger 1997).

Conclusion

Given the tremendous obstacles they face, perhaps the important question is not why do so few people with schizophrenia work, but how does a consistent minority (anywhere from 8–40%) manage to work at all? Which biological, interpersonal, and social factors create vocational facilitators and client strengths that have been overlooked in our current thinking? More important, how can we provide vocational rehabilitation services to greater numbers of people with schizophrenia and do so with greater effectiveness?

To address such questions, research on this population should include larger, more representative samples and employ controls through research design and/or statistical manipulation of macro labor force influences such as ethnicity, social class, gender, and education. Specific measures of paid employment should be included as outcomes, as should standard labor force

indicators such as salary, hours, and job tenure. Studies exploring the relation of work function and work skills to the ability to find and maintain community employment would help to determine future directions for research using generic productivity measures. It also is time for a comprehensive, multivariate statistical examination of interrelationships between a diagnosis of schizophrenia, positive and negative symptoms, and functional impairment in predicting labor force participation.

One current effort with the potential to address many of these questions is a multicenter clinical trials study of vocational interventions called the Employment Intervention Demonstration Program (available at <http://psych.uic.edu/eidp>), funded by the Federal Center for Mental Health Services of the Substance Abuse and Mental Health Services Administration. The study's purpose is to examine clinical and vocational outcomes, services, program costs, and consumer satisfaction among recipients of supported employment services designed for those with disabling levels of mental disorders. Participants at eight sites nationwide include close to half (48%, $n = 794$) with schizophrenia spectrum disorders (schizophrenia, schizoaffective disorder, schizophreniform disorder). Results from this study may be able to enrich our understanding of the ways in which people with schizophrenia experience the vocational rehabilitation process as well as how to improve their chances of success.

Service providers would do well to focus their efforts on establishing symptom relief, and on providing, where appropriate, social skills training, cognitive remediation, neuropsychological assessment, and supportive therapies to address work readiness and demoralization issues. The use of mental health consumer vocational service providers, which has proven successful in studies of diagnostically heterogeneous populations (Kaufmann 1995; Solomon and Draine 1995; Miller and Miller 1997), may be especially helpful here. Working with peers can facilitate a sense of individual empowerment and can offer role-modeling opportunities through exposure to others who have faced similar obstacles, especially those with schizophrenia.

This review of the research and clinical literature on schizophrenia and vocational rehabilitation illustrates potentially fruitful approaches and avenues of investigation. It also indicates the value of cross-disciplinary thinking in solving the puzzle of how to help people with schizophrenia work at optimal and satisfying levels. It remains for the fields of psychiatry, neuropsychology, and rehabilitation to apply this knowledge in a collaborative effort to serve a group of individuals whose productive potential remains largely untapped as the current century draws to a close.

References

- Anthony, W.A., and Jansen, M.A. Predicting the vocational capacity of the chronically mentally ill. *American Psychologist*, 39:537-544, 1984.
- Anthony, W.A.; Rogers, E.S.; Cohen, M.; and Davies, R. Relationships between psychiatric symptomatology, work skills, and future vocational performance. *Psychiatric Services*, 46:353-358, 1995.
- Becker, R.E. An evaluation of a rehabilitation program for chronically hospitalized psychiatric patients. *Social Psychiatry*, 2:32-38, 1967.
- Becker, D.; Drake, R.; Farabaugh, A.; and Bond, G.R. Job preferences of clients with severe psychiatric disorders participating in supported employment programs. *Psychiatric Services*, 47:1223-1226, 1996.
- Beiser, M.; Bean, G.; Erickson, D.; Zhang, J.; Iacono, W.; and Rector, N. Biological and psychosocial predictors of job performance following a first episode of psychosis. *American Journal of Psychiatry*, 151:857-863, 1994.
- Bell, M.; Lysaker, P.; and Milstein, R. Clinical benefits of paid work activity in schizophrenia. *Schizophrenia Bulletin*, 22(1):51-67, 1986.
- Bilder, R.; Turkel, E.; Lipschutz-Broch, L.; and Lieberman, J. Antipsychotic medication effects on neuropsychological functions. *Psychopharmacology Bulletin*, 28:353-366, 1992.
- Black, B.J., ed. *Work as Therapy for the Mentally Ill*. New York, NY: Altro Institute for Rehabilitation Studies, 1986.
- Bolton, B., and Roessler, R. *Manual for the Work Personality Profile*. Fayetteville, AR: Arkansas Research and Training Center in Vocational Research, 1986.
- Bond, G.R., and Dincin, J. Accelerating entry into transitional employment in a psychiatric rehabilitation agency. *Rehabilitation Psychology*, 32:143-155, 1986.
- Bond, G.R., and Friedmeyer, M.H. Predictive validity of situational assessment at a psychiatric rehabilitation center. *Psychosocial Rehabilitation Journal*, 11:61-77, 1987.
- Bond, G.R.; Dietzen, L.; McGrew, J.; and Miller, L. Accelerating entry into supported employment for persons with severe psychiatric disabilities. *Rehabilitation Psychology*, 40:75-94, 1995.
- Bond, G.R.; Drake, R.; Mueser, K.; and Becker, D. An update on supported employment for persons with severe mental illness. *Psychiatric Services*, 48:335-346, 1997.
- Breier, A.; Schreiber, J.; Dyer, J.; and Pickar, D. National Institute of Mental Health longitudinal study of chronic schizophrenia. *Archives of General Psychiatry*, 48:239-246, 1991.

- Brekke, J.; Raine, A.; Ansel, M.; Lencz, T.; and Bird, L. Neuropsychological and psychophysiological correlates of psychosocial functioning in schizophrenia. *Schizophrenia Bulletin*, 23(1):19-28, 1997.
- Brenner, H.; Hodel, D.; Roder, V.; and Corrigan, P. Treatment of cognitive dysfunctions and behavioral deficits in schizophrenia. *Schizophrenia Bulletin*, 18(1):21-26, 1992.
- Bryson, G.; Bell, M.D.; Kaplan, E.; and Greig, T. The functional consequences of memory impairments on initial work performance in people with schizophrenia. *Journal of Nervous and Mental Diseases*, 186:610-615, 1998.
- Bureau of Labor Statistics. Employment status of the civilian noninstitutional population, 1935 to date. In: *Current Population Survey*. Washington, DC: The Bureau, 1999.
- Callahan, M.J. Job site training and natural supports. In: Nisbet, J., ed. *Natural Supports in School, at Work, and in the Community for People With Severe Disabilities*. Baltimore, MD: Paul H. Brookes Publishing, 1992. pp. 257-276.
- Carpenter, W., Jr.; Heinrichs, D.; and Alphas, L. Treatment of negative symptoms. *Schizophrenia Bulletin*, 11(3):440-452, 1985.
- Chandler, D.; Meisel, J.; Hu, W.; McGowen, M; and Madison, K. A capitated model for a cross-section of severely mentally ill clients: Employment outcomes. *Community Mental Health Journal*, 33:501-516, 1997.
- Charisiou, J.; Jackson, H.; Boyle, G.; Burgess, P.; Minas, I.; and Joshua, S. Which employment interview skills best predict the employability of schizophrenic patients? *Psychological Reports*, 64:683-694, 1989a.
- Charisiou, J.; Jackson, H.; Boyle, G.; Burgess, P.; Minas, I.; and Joshua, S. Are employment-interview skills a correlate of subtypes of schizophrenia? *Psychological Reports*, 65:951-960, 1989b.
- Ciardiello, J. Job placement success of schizophrenic clients in sheltered workshop programs. *Vocational Evaluation and Work Adjustment Bulletin*, 14:125-129, 1981.
- Cohen, C.I. Poverty and the course of schizophrenia: Implications for research and policy. *Hospital and Community Psychiatry*, 44:951-959, 1993.
- Cook, J.A. "Vocational Rehabilitation for Youth With Severe Mental Illness: Predictive Validity of Situational Assessment for Later Employment." Paper presented at Annual Meeting of the American Public Health Association, Atlanta, Georgia, 1991.
- Cook, J.A.; Bond, G.; Hoffschmidt, S.; Jonas, E.; Razzano, L.A.; and Weakland, R. Situational assessment. In: *Assessing Vocational Performance Among Persons With Severe Mental Illness*. Chicago, IL: Thresholds National Research and Training Center on Rehabilitation and Mental Illness, 1994. pp. 7-16.
- Cook, J.A., and Hoffschmidt, S. Comprehensive models of psychosocial rehabilitation. In: Flexor, R.W., and Solomon, P., eds. *Psychiatric Rehabilitation in Practice*. Boston, MA: Andover Medical Publishers, 1993. pp. 81-97.
- Cook, J.A., and Pickett, S.A. Recent trends in vocational rehabilitation for people with psychiatric disability. *American Rehabilitation*, 20(4):2-12, 1995.
- Cook, J.A.; Pickett, S.A.; Razzano, L.A.; Fitzgibbon, G.; Jonikas, J.A.; and Cohler, J.J. Rehabilitation services for persons with schizophrenia. *Psychiatric Annals*, 26:97-104, 1996a.
- Cook, J., and Razzano, L.A. Natural vocational supports for persons with severe mental illness: Thresholds supported competitive employment program. In: Stein, L., ed. *Innovations in Mental Health Services*. San Francisco, CA: Jossey-Bass, 1992. pp. 23-42.
- Cook, J.A., and Razzano, L.A. Predictive validity of the McCarron-Dial testing battery for employment outcomes among psychiatric rehabilitation clientele. *Vocational Evaluation and Work Adjustment Bulletin*, 27(2):39-47, 1994.
- Cook, J.A., and Razzano, L.A. Discriminant function analysis of competitive employment outcomes in a transitional employment program. *Journal of Vocational Rehabilitation*, 5(2):27-139, 1995.
- Cook, J.A.; Razzano, L.A.; and Cappelleri, J. Canonical correlation analysis of residential and vocational outcomes following psychiatric rehabilitation. *Evaluation and Program Planning*, 14:351-363, 1996b.
- Cook, J.A., and Rosenberg, H. Predicting community employment among persons with psychiatric disability: A logistic regression analysis. *Journal of Rehabilitation Administration*, 18:6-22, 1994.
- Cook, J.A., and Wright, E. Medical sociology and the study of severe mental illness: Reflections on past accomplishments and directions for future research. *Journal of Health and Social Behavior*, 36:95-114, 1995.
- Dalton, R.F., and Latz, A. Vocational placement: The Pennsylvania Rehabilitation Center. *Rehabilitation Literature*, 39:336-339, 1978.
- Danley, K.; Sciarappa, K.; and MacDonald-Wilson, K. Choose-get-keep: A psychiatric rehabilitation approach to supported employment. In: Liberman, R., ed. *Effective Psychiatric Rehabilitation*. San Francisco, CA: Jossey-Bass, 1992. pp. 87-97.

- Dauwalder, J.P., and Hoffmann, H. Chronic psychoses and rehabilitation: An ecological perspective. *Psychopathology*, 25:139-146, 1992.
- Donegan, K.R., and Palmer-Erbs, V.K. Promoting the importance of work for persons with psychiatric disabilities: The role of the psychiatric nurse. *Journal of Psychosocial Nursing*, 36(4):13-14, 1998.
- Drake, R.; Becker, D.; Biesans, J.; Torrey, W.; McHugo, G.; and Wyzik, P. Rehabilitative day treatment vs. supported employment: I. Vocational outcomes. *Community Mental Health Journal*, 30:519-532, 1994.
- Drake, R., and Becker, D. The Individual Placement and Support Model of supported employment. *Psychiatric Services*, 4:473-475, 1996.
- Evans, B.; Souyma, A.; and Maier, G. A vocational assessment and training program for individuals in an inpatient forensic mental health center. *Psychosocial Rehabilitation Journal*, 13:61-69, 1989.
- Fabian, E. Longitudinal outcomes in supported employment: A survival analysis. *Rehabilitation Psychology*, 37:23-35, 1992.
- Fabian, E., and Luecking, R.G. Doing it the company way: Using internal company supports in the workplace. *Journal of Applied Rehabilitation Counseling*, 22:32-35, 1991.
- Fenton, W., and McGlashan, T. Natural history of schizophrenia subtypes: II. Positive and negative symptoms. *Archives of General Psychiatry*, 48:978-986, 1991.
- Ferdinandi, A.; Yoottanasumopun, V.; Pollack, S.; and Bermanzohn, P. Predicting rehabilitation outcome among patients with schizophrenia. *Psychiatric Services*, 49:907-909, 1998.
- Glynn, S.; Randolph, E.; Eth, S.; Paz, G.; Leong, G.; Shaner, A.; and VanVort, W. Schizophrenic symptoms, work adjustment, and behavioral family therapy. *Rehabilitation Psychology*, 37:323-338, 1992.
- Goldberg, T.; Weinberger, D.; Berman, K.; Pliskin, N.; and Podd, M. Further evidence for dementia of the prefrontal type in schizophrenia. *Archives of General Psychiatry*, 44:1008-1014, 1987.
- Golden, C.J.; Moses, J.A.; Coffman, J.A.; Miller, W.R.; and Strider, F.R. *Clinical Neuropsychology: Interface With Neurologic and Psychiatric Disorders*. New York, NY: Grune and Stratton, 1983.
- Green, M.F. What are the functional consequences of neurocognitive deficits in schizophrenia? *American Journal of Psychiatry*, 153:321-330, 1996.
- Griffiths, R.D. Rehabilitation of chronic psychotic patients: An assessment of their psychological handicap, an evaluation of the effectiveness of rehabilitation, and observations of the factors which predict outcome. *Psychological Medicine*, 4:316-325, 1974.
- Halford, W.K., and Hayes, R. Psychological rehabilitation of chronic schizophrenic patients: Recent findings on social skills training and family psychoeducation. *Clinical Psychology Review*, 11:23-44, 1991.
- Harding, C.M.; Brooks, G.W.; Takamaru, A.; Strauss, J.S.; and Breier, A. The Vermont longitudinal study of persons with severe mental illness: II. Long-term outcome of subjects who retrospectively met *DSM-III* criteria for schizophrenia. *American Journal of Psychiatry*, 144:727-735, 1987.
- Harrow, M.; Sands, J.; Silverstein, M.; and Goldberg, J. Course and outcome for schizophrenia versus other psychotic patients: A longitudinal study. *Schizophrenia Bulletin*, 23(2):287-303, 1997.
- Hayes, R., and Halford, W. Time use of unemployed and employed single male schizophrenia subjects. *Schizophrenia Bulletin*, 22(4):659-669, 1996.
- Heaton, R., and Crowley, T. Effects of psychiatric disorders and their somatic treatments on neuropsychological test results. In: Filskov, S., and Boll, T., eds. *Handbook of Clinical Neuropsychology*, 1981. pp. 481-525.
- Ho, B.; Andreasen, N.; and Flaum, M. Dependence on public financial support early in the course of schizophrenia. *Psychiatric Services*, 48:948-950, 1997.
- Jacobs, H.; Wissusik, D.; Collier, R.; Stackman, D.; and Burkeman, D. Correlations between psychiatric disabilities and vocational outcome. *Hospital and Community Psychiatry*, 43:365-369, 1992.
- Jaeger, J.; Burns, S.; Tigner, A.; and Douglas, E. Remediation of neuropsychological deficits in psychiatric populations: Rationale and methodological considerations. *Psychopharmacology Bulletin*, 28:367-390, 1992.
- Jaeger, J., and Douglas, E. Neuropsychiatric rehabilitation for persistent mental illness. *Psychiatric Quarterly*, 63:71-94, 1992.
- Johnstone, E.; Macmillan, J.; Frith, C.; Benn, D.; and Crow, T. Further investigation of the predictors of outcome following first schizophrenic episodes. *British Journal of Psychiatry*, 157:182-189, 1990.
- Kaufmann, C.L. The Self-Help Empowerment Center: Some outcomes from the first year. *Psychosocial Rehabilitation Journal*, 18:145-162, 1995.
- Keith, S.J.; Regier, D.A.; and Rae, D.S. Schizophrenic disorders. In: Robins, L.N., and Regier, D.A., eds. *Psychiatric Disorders in America*. New York, NY: Free Press, 1991. pp. 35-52.

- Knoedler, W. Individual placement and support: A community mental health center approach to vocational rehabilitation. [Discussion]. *Community Mental Health Journal*, 30:207-209, 1994.
- Kouzis, A.C., and Eaton, W.W. Emotional disability days: Prevalence and predictors. *American Journal of Public Health*, 84:1304-1307, 1994.
- Kregel, J.; Wehman, P.; and Banks, P.D. The effects of consumer characteristics and type of employment model on individual outcomes in supported employment. *Journal of Applied Behavior Analysis*, 22(4):407-415, 1989.
- Lehman, A. Vocational rehabilitation in schizophrenia. *Schizophrenia Bulletin*, 21(4):645-656, 1995.
- Lehman, A., and Steinwachs, D. Patterns of usual care for schizophrenia: Initial results from the Schizophrenia Patient Outcomes Research Team (PORT) survey. *Schizophrenia Bulletin*, 24(1):11-20, 1998a.
- Lehman, A., and Steinwachs, D. At issue: Translating research into practice: The Schizophrenia Patient Outcomes Research Team (PORT) recommendations. *Schizophrenia Bulletin*, 24(1):1-10, 1998b.
- Lindstroem, L.H., and Lundberg, T. Long-term effect on outcome of clozapine in chronic therapy-resistant schizophrenic patients. *European Psychiatry*, 12:353s-355s, 1997.
- Littrell, K. Maximizing schizophrenia treatment outcomes: A model for integration. *Psychiatric Rehabilitation Journal*, 19:75-77, 1995.
- Lysaker, P., and Bell, M. Work performance over time for people with schizophrenia. *Psychosocial Rehabilitation Journal*, 18:141-145, 1995.
- Lysaker, P.; Bell, M.; Milistein, R.; Bryson, G.; Shestopal, A.; and Goulet, J. Work capacity in schizophrenia. *Hospital and Community Psychiatry*, 44:278-280, 1993.
- Lysaker, P.; Bell, M.; and Beam-Goulet, J. Wisconsin Card Sorting Test and work performance in schizophrenia. *Psychiatry Research*, 56:45-51, 1995.
- Malla, A.K.; Lazosky, A.; McLean, T.; Rickwood, A.; Cheng, S.; and Norman, R.M.G. Neuropsychological assessments as an aid to psychosocial rehabilitation of severe mental disorders. *Psychiatric Rehabilitation Journal*, 21:169-173, 1997.
- Mancuso, L. Reasonable accommodations for workers with psychiatric disabilities. *Psychosocial Rehabilitation Journal*, 14(2):3-19, 1990.
- Manschreck, T.C. Psychopathology of motor behavior in schizophrenia. *Progress in Experimental Personality Research*, 12:53-94, 1983.
- Marshak, L.; Bostick, D.; and Turton, L. Closure outcomes for clients with psychiatric disabilities served by the vocational rehabilitation system. *Rehabilitation Counseling Bulletin*, 33:247-250, 1990.
- Massel, H.; Liberman, R.; Mintz, J.; Jacobs, H.; Rush, T.; Gianni, C.; and Zarate, R. Evaluating the capacity to work in the mentally ill. *Psychiatry*, 53:31-43, 1990.
- McCarthy, M., and Bewley, T.H. Patients working out from a psychiatric hospital. *International Journal of Social Psychiatry*, 26:129-143, 1980.
- Miller, L., and Miller, L. ANGELS, Inc.: A consumer-run supported employment agency. *Psychiatric Rehabilitation Journal*, 21:160-163, 1997.
- Mowbray, C.T.; Rusilowski-Clover, G.; Arnold, J.; Allen, C.; Harris, S.; McCrohan, N.; and Greenfield, A. Project WINS: Integrating vocational services on mental health case management teams. *Community Mental Health Journal*, 30:347-362, 1994.
- Mowbray, C.T.; Bybee, D.; Harris, S.; and McCrohan, N. Predictors of work status and future work orientation in people with a psychiatric disability. *Psychiatric Rehabilitation Journal*, 19:17-28, 1995.
- Mueser, K.T.; Becker, D.R.; Torrey, W.C.; Xie, H.; Bond, G.R.; Drake, R.E.; and Dain, B.J. Work and nonvocational domains of functioning in persons with severe mental illness: A longitudinal analysis. *Journal of Nervous and Mental Diseases*, 185:419-426, 1997.
- Munk-Jorgenson, P., and Mortensen, P. Social outcome in schizophrenia: A 13-year follow-up. *Social Psychiatry and Psychiatric Epidemiology*, 27:129-134, 1992.
- Muntaner, C.; Pulver, A.E.; McGrath, J.; and Eaton, W.W. Work environment and schizophrenia: An extension of the arousal hypothesis to occupational self-selection. *Social Psychiatry and Psychiatric Epidemiology*, 28:231-238, 1993.
- Nisbet, J., and Hagner, D. Natural supports in the workplace: A re-examination of supported employment. *Journal of the Association for Persons with Severe Handicaps*, 13:260-267, 1988.
- Noble, J.H. Policy reform dilemmas in promoting employment of persons with severe mental illness. *Psychiatric Services*, 49:775-781, 1998.
- Organisation for Economic Co-Operation and Development. Labour force statistics 1976-1996. *Statistics Directorate*. Paris, France: 1997.
- Polak, P., and Warner, R. The economic life of seriously mentally ill people in the community. *Psychiatric Services*, 47:270-274, 1996.
- Reker, T., and Eikemann, B. Work therapy for schizophrenic patients: Results of a 3-year prospective study in Germany. *European Archives of Psychiatry & Clinical Neuroscience*, 247:314-319, 1997.

- Rogers, E.S.; Anthony, W.A.; Cohen, M.; and Davies, R. Prediction of vocational outcome based on clinical and demographic indicators among vocationally ready clients. *Community Mental Health Journal*, 33:99-112, 1997.
- Rogers, E.S.; Sciarappa, K.; and Anthony, W.A. Development and evaluation of situational assessment instruments and procedures for persons with psychiatric disability. *Vocational Evaluation and Work Adjustment Bulletin*, 24:61-67, 1991a.
- Rogers, E.S.; Walsh, D.; and Masotta, L. *Massachusetts Survey of Client Preferences for Community Support Services (Final Report)*. Boston, MA: Center for Psychiatric Rehabilitation, 1991b.
- Rosenheck, R.; Frisman, L.; and Sindelar, J. Disability compensation and work among veterans with psychiatric and nonpsychiatric impairments. *Psychiatric Services*, 46:359-365, 1995.
- Ruffner, R. The last frontier: Jobs and the mentally ill person. *Psychosocial Rehabilitation Journal*, 9(3):35-42, 1986.
- Russert, M., and Frey, J. The PACT vocational model: A step into the future. *Psychosocial Rehabilitation Journal*, 14(4):7-18, 1991.
- Rutman, I. How psychiatric disability expresses itself as a barrier to employment. *Psychosocial Rehabilitation Journal*, 17(3):15-37, 1994.
- Sauter, A., and Nevid, J. Work skills with chronic schizophrenic sheltered workers. *Rehabilitation Psychology*, 36:255-264, 1991.
- Schultheis, A.M., and Bond, G.R. Situational assessment ratings of work behaviors: Changes across time and between settings. *Psychosocial Rehabilitation Journal*, 17:107-119, 1993.
- Seidman, L. Schizophrenia and brain dysfunction: An integration of recent neurodiagnostic findings. *Psychological Bulletin*, 94:195-238, 1983.
- Silverstein, M.L.; Fogg, L.; and Harrow, M. Prognostic significance of cerebral status: Dimensions of clinical outcome. *Journal of Nervous and Mental Diseases*, 179:534-539, 1991.
- Solinski, S.; Jackson, H.; and Bell, R. Prediction of employability in schizophrenic patients. *Schizophrenia Research*, 7:141-148, 1992.
- Solomon, P., and Draine, J. The efficacy of a consumer case management team: 2-year outcomes of a randomized trial. *Journal of Mental Health Administration*, 22:135-146, 1995.
- Strauss, J. Mediating the processes in schizophrenia: Towards a new dynamic psychiatry. *British Journal of Psychiatry*, 155(5):22-28, 1989.
- Strauss, J., and Carpenter, W. The prediction of outcome in schizophrenia. *Archives of General Psychiatry*, 27:739-746, 1972.
- Strong, M. Optimum models: *What Really Works?* [Research results report]. Washington, DC: National Institute on Disability and Rehabilitation Research, December, 1996. (Available online at <http://www.ncddr.org/doorways/emp/support/result.html>.)
- Stuve, P.; Erickson, R.; and Spaulding, W. Cognitive rehabilitation: The next step in psychiatric rehabilitation. *Psychosocial Rehabilitation Journal*, 15:9-26, 1991.
- Taylor, M.; Redfield, J.; and Abrams, R. Neuropsychological dysfunction in schizophrenia and affective disease. *Biological Psychiatry*, 10:467-478, 1981.
- Ticket to Work and Work Incentives Improvement Act of 1999, Pub. L. No. 106-170, 113 STAT 1860 (1999).
- Traubmann, K. Encoding processes and memory for categorically related words by schizophrenic patients. *Journal of Abnormal Psychology*, 89:704-716, 1980.
- Tsuang, D., and Coryell, W. An 8-year follow-up of patients with DSM-III-R psychotic depression, schizoaffective disorder, and schizophrenia. *American Journal of Psychiatry*, 150:1182-1188, 1993.
- U.S. Department of Justice. *Enforcing the ADA: A Status Report From the Department of Justice, July-September*. Washington, DC: U.S. Department of Justice, Civil Rights Division, 3:1-20, 1998.
- van Os, J.; Fahy, T.; Jones, P.; Harvey, I.; Lewis, S.; Williams, M.; Toone, B.; and Murray, R. Increased intracerebral cerebrospinal fluid spaces predict unemployment and negative symptoms of psychotic illness. A prospective study. *British Journal of Psychiatry*, 166:750-758, 1995.
- Veteran's Administration. *To Work Again, To Live Again: The Vocational Rehabilitation of Homebound Veterans*. Washington, DC: Veterans Administration, Department of Veterans' Benefits, 1965.
- Walker, R.; Winick, W.; Frost, E.; and Lieberman, J. Social restoration of hospitalized psychiatric patients through a program of special employment in industry. *Rehabilitation Literature*, 30:297-303, 1969.
- Ware, N.C., and Goldfinger, S. M. Poverty and rehabilitation in severe psychiatric disorders. *Psychiatric Rehabilitation Journal*, 21:3-9, 1997.
- Wehman, P., and Moon, M., eds. *Vocational Rehabilitation and Supported Employment*. Baltimore, MD: Paul H. Brookes, 1988.
- Weiden, P.J.; Aquila, R.; and Standard, J. Atypical antipsychotic drugs and long-term outcome in schizophrenia. *Journal of Consulting Psychiatry*, 57:53-60, 1996.

Whitehead, C.W. Sheltered workshop study: A nationwide report on sheltered workshops and their employment of handicapped individuals. In: *Workshop Survey*. Vol. 1. Washington, D.C.: U.S. Department of Labor Service, 1977.

Yozawitz, A. Applied neuropsychology in a psychiatric center. In: Grant, L., and Adams, K., eds. *Neuropsychological Assessment of Neuropsychiatric Disorders*. New York, NY: Oxford University Press, 1986. pp 121-146.

Acknowledgment

Preparation of this article was supported in part by a grant from the U.S. Department of Education, National Institute on Disability and Rehabilitation Research, and

the Substance Abuse and Mental Health Services Administration, Center for Mental Health Services (Cooperative Agreement #H133B50004). The opinions expressed herein do not necessarily reflect the position, policy, or views of either agency, and no official endorsement should be inferred.

The Authors

Judith A. Cook, Ph.D., is Professor and Director, Mental Health Services Research Program, Department of Psychiatry, University of Illinois at Chicago, Chicago, IL. Lisa A. Razzano, Ph.D., is Assistant Professor, Mental Health Services Research Program.