

Evaluating the Capacity to Work of the Mentally Ill

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THIS STUDY explored the relationship between psychiatric symptomatology and the functional capacity to work. Subjects were diagnosed using *DSM-III* criteria and were grouped into categories of psychotic or nonpsychotic, and disabled or nondisabled, in regard to adjudication for mental impairment from the Social Security Administration (SSA). There were significant relationships between disability status and work capacity, in the direction of better performance for the nondisabled subjects. This finding reflected concordance between the evaluation procedure used in the study and the SSA's disability determination process. There was considerable overlap in work performance among subjects, however, suggesting that a functional assessment of work capacity might improve disability determination in certain cases. Results suggested that these work assessments might be as short as one or two days.

Vocational disability is a central feature of mental disorders, integral to *DSM-III* and *DSM-III-R* diagnostic criteria. Sustained unemployment rates among psychiatric patients have been reported as high as 70% (Goldstrom and Mandercheid 1982). Although there has been much interest in the relationship between

psychiatric illness and the capacity to work (Anthony and Jansen 1984; Liberman 1982), there have been little empirical data to clarify this relationship.

Imprecise understanding of the work capacity of psychiatric patients poses problems for mental health professionals and the public agencies that provide ser-

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This research was supported by research grant number 10-P-98193-9 from the Social Security Administration, and NIMH Clinical Research Center grant MH 30911.

This paper represents the views of the authors and is not to be construed as approved or authorized by the Social Security Administration, UCLA, or the Veterans Administration.

vices and assistance. Psychiatrists and other mental health professionals are called upon to provide documentation of symptomatic impairments and functional disabilities of persons applying for Social Security Administration (SSA) benefits and also serve as consultants to the SSA in the disability determination review process. A recent study that examined the reliability and validity of SSA psychiatric disability criteria, undertaken by the American Psychiatric Association (APA), found reasonable agreement on most cases between SSA adjudication decisions and the professional judgment of expert psychiatrists (American Psychiatric Association 1988). Disability determinations by SSA and the judgments made in the APA study were based on the assumption of a causal relationship between psychiatric symptomatology and the functional capacity to work, but the evidence for this relationship is scanty and inconclusive across the spectrum of psychiatric disorders.

In an extensive review of the literature regarding the vocational capacity of the psychiatrically impaired, Anthony and Jansen (1984) concluded that ratings of psychiatric symptoms are not valid predictors of work capacity (Gurel and Lorei 1972; Schwartz et al. 1975; Strauss and Carpenter 1972). However, most of the studies reviewed by Anthony and Jansen were carried out in the pre-*DSM-III* era, when psychiatric diagnosis and assessment of symptoms were less reliable. Moreover, other limitations of earlier work were the clumping of patients into categories of "chronic mental patients" and using long-term hospitalized patients as subjects (Distefano and Pryer 1970; Griffiths 1974), in which diagnosis and levels of psychopathology were often unreliably elicited and recorded. More recent studies, utilizing modern methods of diagnosis, have reported relationships between symptoms and work performance (Black 1986; Cole and Shupe 1970; Tsuang et al. 1979; Westermeyer and Harrow 1987). If the relationship between work capacity and vocational functioning

is to be understood, it is important to examine a representative spectrum of psychiatric patients using state-of-the-art diagnostic criteria and interview instruments.

Additional methodological limitations of the earlier work in this field impede a valid grasp of the relationship between psychiatric symptoms and work capacity. One flaw in many outcome studies has been that psychiatric symptoms at time A have been compared with work status at time B. Few studies have assessed work capacity and psychopathology concurrently, yet simultaneous assessments of these factors are the relevant format for disability determination. In addition, vocational outcome studies generally have relied on global measures, such as recidivism rate and posthospital employment—the latter often simply dichotomized as success or failure, depending on whether or not the individual was working competitively at a follow-up point (Cheadle and Morgan 1972; Distefano and Pryer 1970; Griffiths 1974). A broader range of more differentiated measures, such as productivity level, responses to work-place stressors and the ability to arrive at work on time and remain on the job, is needed to understand the work capacity of psychiatric patients (Anthony and Farkas 1982; Carpenter and Black 1986).

Functional assessments of vocational skills in work or worklike settings have demonstrated some predictive validity of the capacity to work (Anthony and Jansen 1984; Carpenter and Black 1986), although few studies have been completed since Allen and Loeber concluded in 1972 that the development of scales for rating the work performance of psychiatric patients was in the embryonic stage. Expanding on the scales of Cheadle and associates (Cheadle et al. 1967; Cheadle and Morgan 1972) and Griffiths (1973), Black (1986) validated a 36-item rating scale of patients' work performance for use by work supervisors. This scale was found to be useful in predicting successful completion of vocational training and placement in a competitive job.

CAPACITY TO WORK OF MENTALLY ILL

It seems reasonable to assume that adequate assessment of work capacity should be conducted in a naturalistic work setting, include direct observations of vocationally relevant skills and deficits, and assess the degree to which psychiatric symptoms interfere with work performance. Given these criteria, the present study was designed to develop and empirically validate a structured, operationalized, psychiatric and behavioral assessment protocol to determine work capacity in psychiatrically impaired individuals. Hypotheses of the study were that better performance in the work capacity evaluations would be found for subjects who were: a) nonpsychotic vs. psychotic; b) nondisabled vs. disabled, in regards to adjudication for mental impairment by the SSA or the Department of Veterans Affairs (VA); and c) experiencing lower levels of psychiatric symptomatology. The study was also designed to examine concordance in determining work capacity between a reliable and valid functional assessment of the capacity to work and the disability determination procedures in current usage by the SSA.

METHOD

Psychiatrically impaired individuals with psychotic or nonpsychotic disorders, who were adjudicated by the SSA or VA as disabled for mental impairment or who had not been adjudicated as disabled, were evaluated for their work capacity in either a 3-day or 15-day vocational assessment.

Subjects

The subjects were 143 males recruited from among inpatients and outpatients of the West Los Angeles VA Medical Center (VAMC), the Neuropsychiatric Institute of UCLA and several community outreach programs in the Los Angeles area. Seventy-nine subjects were classified as having a psychotic disorder and 64 were classified as having a non-psychotic disorder.

Psychotic disorders were schizophrenia, affective disorders with psychotic features and atypical psychotic disorders. Nonpsychotic disorders were affective disorders without psychotic features, anxiety disorders, personality disorders and substance abuse disorders. Thirty-nine psychotic subjects and 23 nonpsychotic subjects were receiving disability payments for mental impairments from the SSA (i.e., either Social Security Disability Income or Supplemental Security Income) or from the VA (i.e., at least a 40% Service-Connected pension). The diagnostic breakdown of subjects across the groups of the study is shown in Table 1, and demographic characteristics are provided in Table 2. These subjects constituted the first half of a larger sample participating in the study.

Disability Status

The 62 disabled subjects included 10 who were so designated on the basis of their receiving at least a 40% VA pension for service-connected psychiatric disability. The 40% figure was used as it is roughly equivalent to the basic monetary rate for Supplemental Security Income. Moreover, the procedures for determining disability for SSA and the VA overlap considerably, in terms of psychiatric evidence required. Of the 81 subjects categorized as nondisabled at the time of their participation in the study, 23% were screened for disability and denied benefits by SSA; 59% had not applied for SSA disability; and 18% subsequently applied for and received disability from SSA after completing their study participation.

In August 1985, the SSA revised the criteria for determining psychiatric disability to reflect advances in the treatment and evaluation of psychiatric disorders. The new criteria were in accord with the American Psychiatric Association's *Diagnostic and Statistical Manual*, 3rd ed. The evaluation of functional limitations was extended to include concentration and task performance and deterioration under worklike conditions. Approximately 66%

Table 1
DIAGNOSTIC GROUPING OF SAMPLE

Group	Number	Schizophrenia	Depression	Bipolar	Anxiety/ Adjustment/ Personality	Substance Abuse
Psychotic- Disabled	39	32	2	5	0	0
Psychotic- Nondisabled	40	23	13	4	0	0
Nonpsychotic- Disabled	23	0	13	4	4	2
Nonpsychotic- Nondisabled	41	0	24	8	6	3

of the SSA-disabled subjects in the study were originally adjudicated as disabled before the criteria were changed.

Psychiatric Evaluation

Two structured, clinical interviews were administered to subjects at the time of intake into the study—the Expanded Present State Examination (PSE) and the Expanded Brief Psychiatric Rating Scale (BPRS), both in routine use at the UCLA Clinical Research Center for Schizophrenia and Psychiatric Rehabilitation. The PSE (Wing et al. 1974) is an interview instrument that aids clinicians in eliciting and rating symptoms for making diagnoses based on the American Psychiatric Association's *DSM-III* and *DSM-III-R* criteria. The BPRS (Lukoff et al. 1986) permits the clinician to elicit and rate current levels of psychiatric symptomatology

in 18 categories. A factor analysis of the BPRS has identified five distinct factors, each made up of three or four categories (Guy et al. 1975). These factors and their respective categories are listed in Table 3.

Work Capacity Evaluation

Following completion of the psychiatric examination, subjects were randomly assigned to either a 3-day or 15-day evaluation of their work capacity. The Work Capacity Evaluation (WCE) was situated in a factory-style building that also housed a Rehabilitation Service sheltered workshop at the VA Hospital. The evaluations were conducted in an area with six workstations and a supervisor's desk. Up to 6 subjects worked simultaneously for 7 hours per day, including breaks. They reported each morning to the supervisor,

Table 2
CHARACTERISTICS OF SAMPLE

Group	Number	Mean Age	Percent Ever Married	Mean Age of Onset	Mean Times Hospitalized	Percent Work Past Year*
Psychotic- Disabled	39	34	38.5	21.7	4.6	10.2
Psychotic- Nondisabled	40	36	55.0	24.2	3.5	40.0
Nonpsychotic- Disabled	23	45	69.6	27.5	4.6	17.4
Nonpsychotic- Nondisabled	41	45	63.4	25.4	2.2	48.8

*Percentage of subjects who worked at least 50% of the time during the past year.

CAPACITY TO WORK OF MENTALLY ILL

Table 3
BPRS FACTORS

Factor	Category
<i>Anxiety-Depression</i>	Somatic Concern Anxiety Guilt Feelings Depressive Mood
<i>Anergia</i>	Emotional Withdrawal Motor Retardation Blunted Affect Disorientation
<i>Thought Disturbance</i>	Conceptual Disorganization Grandiosity Hallucinations Unusual Thought Content
<i>Activation</i>	Tension Mannerisms and Posturing Excitement
<i>Hostile-Suspiciousness</i>	Hostility Suspiciousness Uncooperativeness

who assigned them to a work-station and a specific job, gave them instructions and explained the rules of the shop. (See appendix.)

The jobs, or tasks, were representative of basic work activities in the community. To ensure the relevancy of the tasks, a panel of rehabilitation and vocational counselors from the Los Angeles area was convened to plan and design requirements and operational elements for the tasks. Based on the panel's recommendations, eight sample tasks were developed. The tasks were validated as representative of entry-level jobs available in the community by other vocational and rehabilitative experts, as well as by foremen and employers. These individuals were asked the following questions regarding the tasks:

1. How representative of work in the community is this task?
2. Would performance on this task be related to readiness to work?
3. Should this task be included in the work sample?

Tasks were ranked according to the endorsements of these "experts." The four tasks ranked the highest were selected for

the WCE. The selected tasks were an electronic circuit board assembly, folding and packaging hand towels for use by airlines, assembling a toilet tank apparatus, and filing index cards. These tasks measured a spectrum of basic work activities, such as fine and large motor dexterity, sequencing, neatness, accuracy and clerical skills.

Work capacity is a multidimensional concept, including work productivity, quality of workmanship, ability to respond to supervisory demands, cooperation with others, problem solving in the workplace, ability to follow instructions, punctuality, grooming, attendance, and ability to persist in a work situation. Observational data were collected in all of these areas. The Time Sample Behavioral Checklist (TSBC) (Paul and Lentz 1977), a structured and validated observational instrument, was used to record various kinds of appropriate and inappropriate behavior at randomly selected intervals.

An assessment battery was constructed to ascertain the work capacity of subjects, consisting of the following measures:

1. Work productivity—assessed through a Work Performance Index (WPI). The WPI was the total number of units produced each work session, minus the number of defective units. Scores on each workshop task were standardized to the performance of all nondisabled subjects in the study. Each subject's WPI score was the cumulative average of his performance over all work sessions.

2. Work tolerance—defined as the ability to maintain attendance in the work setting. Missed sessions and premature drop-outs were the criteria used to determine work tolerance.

3. Punctuality—assessed at the beginning of each work day and then following breaks and lunch.

4. Acceptability of grooming—ratings were made each morning on body odor, cleanliness of face and hands, acceptability of dress, condition of hair, and whether the subject was clean shaven.

5. Inappropriate behavior—TSBC categories such as "mumbling to oneself" or "stereotypical behaviors" were used to assess unacceptable behavior during work.

6. Persistence—percentage of time on task and working, measured by the TSBC.

Reliability of Measurement

Interrater reliability coefficients were calculated on all WCE measures throughout the project, and all coefficients were .90 or higher. This high rate of agreement was expected, as most of the behavior categories were readily discriminable, thus minimizing subjective inferences by the raters. In behavioral assessment, where coding decisions are based on the occurrence vs. non-occurrence of highly visible acts, it is well established that interrater reliability is extremely high—often over 90% agreement (Hersen and Bellack 1981). The formula of agreements on occurrence divided by agreements plus disagreements on occurrence was used to calculate reliability coefficients. This method is used widely in the behavioral psychology literature.

Another measure of the reliability of the WCE was obtained from test-retest correlations in the WPI. The consistency or stability of subjects' productivity could be ascertained by determining the relationship of early to late performance in the 3-day work evaluation. A high degree of stability was found, with correlations of 0.91 between the first and third day's WPI.

RESULTS

Two $2 \times 2 \times 2$ factorial multivariate ANOVAs were conducted to examine differences in psychopathology and work capacity between the disabled vs. nondisabled, psychotic vs. nonpsychotic, and 3-day vs. 15-day WCE subjects. The first MANOVA examined performance on the work capacity battery. A statistically significant MANOVA effect was found for the disabled vs. nondisabled factor (MANOVA $f=2.51$; $df=5$, 129; $p=.033$). As shown in Table 4, nondisabled subjects had significantly higher scores on

the WPI than disabled subjects. They were also better groomed ($F=4.69$, $p=.03$) and showed better work tolerance ($F=4.01$, $p=.05$) than disabled subjects. There was considerable overlap among individual subjects, however. Approximately 20% of the disabled individuals performed at or above the WPI mean for the nondisabled subjects, and a similar percentage of nondisabled subjects performed at or below the WPI mean for disabled subjects.

The psychotic vs. nonpsychotic factor was nonsignificant as a main effect and in interaction with disability status in the MANOVA and in each of the univariate ANOVAs. The only significant difference between the 3-day and 15-day WCE periods was in work tolerance, with 3-day subjects more regular in attendance ($f=6.88$, $p=.01$). There were no significant interactions between length of workshop and either disability status or type of disorder.

The second MANOVA examined the five cluster scores and the total score for the BPRS. In these analyses there were no significant differences between the disabled and nondisabled subjects. Thus, levels of symptom severity did not differentiate the disabled from the nondisabled subjects. There also were no significant main effects for workshop length.

A highly significant main effect for the psychotic vs. nonpsychotic factor (MANOVA $f=12.61$; df 5, 129; $p=.001$) was found. As shown in Table 5, significant univariate differences were found for total levels of symptomatology ($f=16.29$, $p=.0001$) and for the BPRS clusters of thought disturbance ($f=63.17$, $p=.0001$) and hostile/suspiciousness ($f=8.24$, $p=.005$). In each case, psychotic individuals were more symptomatic than nonpsychotics.

Relationships between psychiatric symptoms and performance on the work capacity battery, using the Pearson product-moment correlation coefficient, are presented in Table 6. Correlation coefficients were run separately for the three diagnostic categories best represented in the subject sample: schizophrenia, depres-

CAPACITY TO WORK OF MENTALLY ILL

Table 4
MEAN SCORES ON WORK CAPACITY BATTERY: DISABLED VS. NONDISABLED SUBJECTS

<i>Work Capacity Measure</i>	<i>Disabled</i>	<i>Nondisabled</i>	<i>Significance Level</i>
Work Performance Index*	45.3	49.5	.004
Work Tolerance*	74.8	84.9	.05
Punctuality**	6.4	5.2	<i>ns</i>
Persistence (on-task)*	97.1	97.6	<i>ns</i>
Inappropriate Behavior**	4.5	4.3	<i>ns</i>
Grooming*	81.9	90.2	.03

*Higher score equals better performance.

**Higher score equals more impairment.

sion, and bipolar disorder. Different BPRS symptom categories were significantly correlated with measures from the WCE battery for the disparate diagnostic categories. Lower scores on the WPI were significantly correlated with higher levels of hostility, suspiciousness, unusual thought content, and emotional withdrawal for schizophrenic subjects; higher levels of blunted affect and suicidality for depressed subjects; and higher levels of conceptual disorganization, excitement, and self-neglect for those with bipolar disorders. Poor work tolerance was significantly correlated with somatic concerns and suicidality for depressed subjects and bizarre acts (i.e., behaviors out of the ordinary) for subjects with bipolar disorders. Poor grooming was significantly correlated with uncooperativeness and self-neglect for schizophrenic subjects; somatic concerns, depression, hostility, and suicidality for depressed subjects; and tension

for bipolar subjects. Poor punctuality was significantly correlated with high levels of hallucinations for schizophrenic subjects. Inappropriate behavior observed while working was significantly correlated with high levels of tension, mannerisms, and bizarre acts for schizophrenic subjects. These correlation coefficients were all in the expected direction—that is, higher symptom levels were associated with poorer performance. However, higher levels of guilt were significantly correlated with higher WPI scores for depressed subjects and higher levels of motor retardation were significantly correlated with better work tolerance (but not productivity) for schizophrenic subjects.

Three-day vs. 15-day WCEs were conducted to determine the most efficient length of an evaluation. Performance scores for each subject on each measure of the work capacity battery were averaged for each half-day of work and then corre-

Table 5
MEAN SCORES ON BPRS CLUSTERS: PSYCHOTIC VS. NONPSYCHOTIC SUBJECTS

<i>BPRS Cluster</i>	<i>Psychotic</i>	<i>Nonpsychotic</i>	<i>Significance Level</i>
Anxiety-Depression	2.41	2.59	<i>ns</i>
Anergia	1.52	1.45	<i>ns</i>
Thought Disturbance	2.58	1.19	.0001
Activation	1.67	1.58	<i>ns</i>
Hostile-Suspiciousness	2.04	1.62	.005
Total BPRS Score	37.16	30.56	.0001

Table 6

SIGNIFICANT RELATIONSHIPS: SYMPTOMS AND WORK MEASURES ACROSS DIAGNOSTIC CATEGORIES (NEGATIVE CORRELATION INDICATES THE MORE SYMPTOMATIC SUBJECTS PERFORM WORSE ON WCE MEASURES THAN THE LESS SYMPTOMATIC.)

WCE Measure	Diagnostic Category		
	Schizophrenia	Depression	Bipolar Disorder
WPI	Hostility (-.30*)	Guilt (.39**)	Conceptual Disorg. (-.48*)
	Suspicious. (-.33**)	Blunted Affect (-.27*)	Excitement (-.45*)
	Unusual Thoughts (-.29*)	Suicidality (-.32*)	Self-neglect (-.44*)
	Emotional Withdrawal (-.35**)		
Work Tolerance	Motor Retard. (-.29*)	Somatic (-.32*)	Bizarre Acts (-.47*)
		Suicidality (-.28*)	
		Depression (-.28*)	
Grooming	Uncoop. (-.36**)	Somatic (-.31*)	Tension (-.54**)
	Self-neglect (-.33**)	Depression (-.34**)	
		Hostility (-.30*)	
		Suicidality (-.46***)	
Punctual	Hallucinations (-.29*)		
Inappropriate Behavior	Tension (-.43***)		
	Mannerisms (-.28*)		
	Bizarre Acts (-.27*)		

*Significant difference ($p < .05$).

**Significant difference ($p < .01$).

***Significant difference ($p < .001$).

lated with final performance on that measure for the entire evaluation period. Most of the measures of the work capacity battery stabilized very quickly. The WPI correlated .90 and .84 with final scores for 3-day and 15-day subjects, respectively, after only two half-day work sessions. Likewise, inappropriate behaviors correlated .91 and .69 with final scores for 3-day and 15-day subjects, respectively, after only two half-day work sessions. In contrast, a measure of punctuality took longer to stabilize; correlations of punctuality with final score after four half-day sessions were .90 and .55 for 3-day and 15-day subjects, respectively.

DISCUSSION

One goal of the study was to determine whether SSA-adjudicated disability status could be predicted from a psychiatric

evaluation. Psychotic subjects were more symptomatic than nonpsychotic subjects, as measured by BPRS ratings, but disabled subjects were not differentiated from nondisabled subjects on the basis of these psychiatric ratings, within neither the psychotic nor the nonpsychotic group. One explanation for the lack of significant difference in psychopathology between the adjudicated disabled vs. nondisabled subjects—despite the finding of significantly different work performances—may lie in the enduring vulnerability to vocational demands inherent in the disabled group, even during periods of little or no symptomatology. Treatment of the underlying psychiatric disorder, as with psychotropic drugs, may have masked symptoms but not afforded protection to the disabled subjects against the rigors of a work evaluation.

Findings of differences between dis-

CAPACITY TO WORK OF MENTALLY ILL

abled and nondisabled subjects in the WCE provide some corroboration for current SSA criteria and procedures for determining disability. For the most part, individuals who were adjudicated as disabled appeared to be more work incapacitated than those not so adjudicated. These differences between disabled and nondisabled subjects held up even when diagnoses were controlled, adding further weight to these findings.

Disability status very likely exerts an adverse influence on work performance for several reasons. Disabled persons have been unemployed for longer periods of time; hence, their lower WPI scores would be expected to reflect inactivity and lack of instrumental task involvement. That disability pensions serve as disincentives to work has been well documented in the literature; moreover, being disabled would be expected to negatively affect an individual's personal identity as a worker. Thus, while work incapacity from a mental disorder may lead to disability, the status and role of a disabled person may also reinforce work incapacity.

Although differences were found between adjudicated disabled and nondisabled subjects, there was much overlap, and a substantial number of disagreements occurred in the classification analysis. There are several hypotheses to explain why some of the adjudicated disabled population performed relatively well in the work capacity assessments. Some may have been initially classified correctly as disabled by SSA, but their condition may have improved by the time they entered the study to the point that they were no longer disabled. Others may have been in a temporary period of remission during their WCE. Moreover, the WCE may have only approximated the stress inherent in reality-based work settings, thereby failing to discriminate fully between work-capable and incapable subjects. Still others may have been originally misclassified as disabled and, in fact, may have been work capable throughout their time as SSA beneficiaries. Cases of disagreement between the WCE and the

SSA are being more thoroughly examined to clarify the actual work capacity of these individuals.

Another explanation for the adequate work functioning of a minority of disabled subjects is that some of these individuals may have been determined to be disabled on the basis of impairments in functioning not fully tapped by our WCE. The SSA uses criteria in addition to work capacity in the disability determination process, including ratings of the severity of the mental impairment, restrictions of activities of daily living, difficulties in maintaining social functioning, deficiencies in concentration and deterioration in work settings. The present researchers are engaged in a related project to determine the validity of these additional criteria for disability determination.

A minority of nondisabled individuals performed poorly in the WCE. These may have been individuals who subsequently received SSA disability following participation in the project. Project staff are presently working with SSA staff to identify these individuals and then examine their performance in the WCE.

The conclusion that psychopathology is unrelated to work performance, as argued by Anthony and Jansen (1984), does not appear to be supported by the present data. Specific psychiatric symptoms were found to be related to work performance and other measures of the WCE for subjects with schizophrenia, depression, and bipolar disorders. Subjects with schizophrenia who were experiencing positive symptoms, such as delusions and hallucinations, were impaired in their ability to work productively and to be on time for work sessions. Emotional withdrawal, a negative symptom of schizophrenia, was also correlated with poor work performance. Thus, both positive and negative symptoms of schizophrenia appear to affect one's ability to work.

Conceptual disorganization, one form of psychopathology that would seem likely to interfere with instrumental task activities, was found to be significantly negatively correlated with work productivity

for those subjects with bipolar disorders but not for those with schizophrenia. Conceptual disorganization on the BPRS is rated in terms of the degree that speech is confused, disconnected, or disorganized. One explanation for the lack of a relationship between this BPRS category and the WPI for schizophrenia might be that those subjects with schizophrenia in the study, in general, were maintained by neuroleptic medications and were not in the midst of acute psychotic episodes. Thus, while they might still have been experiencing some delusions and hallucinations, their speech patterns lacked the tangentiality or circumstantiality characteristic of a florid state of schizophrenia. The significant negative correlation between conceptual disorganization and the WPI for those with bipolar disorders, on the other hand, may be due to a number of subjects who participated in the study in the latter stages of a manic episode.

Suicidal ideation appears to be the best predictor of the inability to work in depressed subjects. Those depressed subjects who were seriously considering suicide were poorly groomed, had poor work productivity, and tended to drop out of the WCE before completing the project. They had apparently given up hope, and this was reflected in their WCE performance. Somewhat surprisingly, depressed subjects with strong feelings of guilt performed well on the WPI. There was also a nonsignificant tendency for these individuals to persist in their WCE tasks. Possibly they became highly engaged in their work as a means of compensating for or distracting themselves from their feelings of guilt.

Given that the results from this study show solid relationships between symptomatology and work performance, are

these relationships stable and enduring, or will they vary with the course of the psychiatric disorder? The design of the study, which only included one 3- to 15-day testing period, does not permit a definitive answer, but the degree to which capacity to work remains stable probably varies considerably across different psychiatric disorders. Normal individuals, for example, would not be expected to fluctuate markedly over time, and the same might be true for some patients with non-intrusive neurotic disorders. For other patients, however, the WCE might be a valid measure of current work capacity but a relatively poor predictor of work capacity in the future if substantial changes in the clinical course had occurred. In such cases, use of WCE measures as predictors of future outcome would require concurrent attention to adequacy of treatment and clinical course. A 12-month follow-up of vocational, psychiatric and role functioning of the individuals who participated in this project is in progress, which should cast additional light on the stability of the relationships between psychiatric symptoms and work capacity, as well as on the validity of the WCE procedures.

The disagreements between the WCE and the SSA disability designation in a substantial percentage of cases, coupled with the imperfect correlations between psychiatric symptomatology and work performance, suggest that a functional assessment of work capacity may be a useful adjunct in SSA disability determination evaluations. In addition, longitudinal assessments utilizing repeated work capacity evaluations might improve the determination of disability in persons experiencing recurrent, chronic mental disorders.

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CAPACITY TO WORK OF MENTALLY ILL

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APPENDIX

PROCEDURES USED IN THE WORK CAPACITY EVALUATION (WCE)

The 3-day WCE was divided into six half-day (3-hour) work sessions. During each session subjects worked on one of the four tasks. Following orientation, subjects were assigned to work on one of the four tasks. For each task, the supervisor gave instructions to the subjects with accompanying demonstrations. Subjects were encouraged to solve problems themselves, but they could ask questions of the supervisor. They were also told to clean up their work stations at the end of each work session. Brief summaries of the tasks and their instructions follow:

1. *Circuits*. The circuit has two side casings, a base piece, two sizes of pins and notches. Insert the small pins into the grated side casing, pushing them in so that only the notch is visible. Next, insert the large pin into the other side casing. With the opening pointing towards the large pin, slide the notch into place. Fit both side casings tightly together. Attach the base piece by snapping the prongs into the side casing. Then, wrap a rubberband around the entire circuit.
2. *Towels*. Fold each towel in half, then in thirds, and then in half again. Pack 30 towels in each tray, and then wrap the tray in plastic. To wrap a tray, lift and pull the plastic over the tray. Fold the plastic around and under the tray, then pull the tray up and bring it down so the

- heated bar cuts the plastic. Straighten the plastic and pull it tightly over the bottom. Place the tray on the heated pad to secure the bottom seal.
3. *Toilets.* To assemble the flush mechanism, place the handle in the square hole in the front of the toilet. Then place two washers on the handle. Set the central section into the circular cage, sliding the protruding part into the slit on the cage. Place the horseshoe-shaped piece into the holes on top of the shaft. Then, place the completed central portion into the largest opening on the bottom. (There were also detailed instructions for assembling other sections of the toilet.)
 4. *Filing Cards.* Each of these index cards has the name of a city, brand of car, and owner. The four cities are Sacramento, San Diego, San Francisco, and Los Angeles, and each box has the name of a city. Inside each box there are dividers with the name of a car company, Ford, Mercedes, or Toyota. You will be filing the cards by city, car name, and by the owners' last name.

Functional Assessments

Functional measures were devised to assess the dimensions of prevocational, technical, job maintenance, and social skills. For psychiatric patients, work capacity also includes the ability to function appropriately, whether or not one is experiencing psychiatric symptoms. Functional measures were devised to assess each of these dimensions.

Prevocational skills involved measures of attendance, punctuality, and personal hygiene, taken at the beginning of each day of assessment. Punctuality was also rated after breaks and lunch.

Job maintenance skills included measures of following workshop rules, requests for assistance, need for prompts to stay on-task, complaints about the tasks or the environment, and maintenance of the work station following work sessions.

Technical skills involved ratings of the quantity and quality of work. The total number of parts produced each work session was recorded and each part was examined for accuracy. A Work Performance Index was constructed to reflect technical skills in the WCE.

Coping in vocational situations was measured through contrived situations, which were standardized means to assess the effects of increased demand by the supervisor on production, the ability to solve problems, cooperation with others in the work place, and the ability to follow instructions. Descriptions of these situations follow:

1. *High vs. Low Demand.* Two tasks, assembling circuits and folding towels, were presented twice, once under low demand conditions and once under high demand conditions, designed to be moderately stressful. To create a condition of high demand (stress), the supervisor interrupted subjects three times during the 3-hour session with instructions to work faster and try harder. To create a low demand condition, the supervisor also approached three times, but the subjects were told that they were working well and that they just needed to keep up the good work.
2. *Problem-Solving Abilities.* Situations were unobtrusively introduced into the work situation to determine subjects' problem-solving abilities. Different obstacles or deficiencies were used for each task. For the circuits, for example, two of the metal prongs on the base piece were missing, the subject was not provided with enough base pieces for the entire work session, a piece was broken off of a base piece, or one of the side casings had paint on it. Subjects' responses to these situations were coded as negative if the subject stopped working or simply kept working (e.g., using a broken piece in the assembly), and as positive if he/she recognized the problem and either asked for help or solved the problem by him/herself.
3. *Cooperation with Others.* Supervisors in the VA Medical Center's sheltered workshop, which was situated in the same building as the WCE program, approached the subjects and asked for their help in carrying out simple tasks (e.g., holding a ladder steady or helping to carry a box). These individuals were known to the subjects, but they did not have any supervisory role with the subjects. Subjects' responses to these situations were coded as negative if the subject refused to cooperate or used negative or abusive language (e.g., "I

CAPACITY TO WORK OF MENTALLY ILL

don't want to help you" or "Leave me alone, I have work to do"), and as positive if the subject politely refused to cooperate (e.g., "I'm sorry, but I am busy right now"), or cooperated.

4. *Following Instructions.* Situations were designed to determine if the subjects were able to follow simple and complex instructions. Subjects were given instructions with two, three or four distinct steps. An example of a 4-step instruction is, "Please get a cart, stack your toilet tanks on the cart, take it to the shelves and unload it, and then bring the cart back to your work station." The number of steps accurately completed in each situation was recorded.

In addition to the other measures, a broad assessment of overall behavior was conducted during each half-hour block of time throughout the workday. The Time Sample Behavior Checklist (TSBC), a valid and reliable instrument for assessing all aspects of an individual's social and instrumental behavior, was used for this purpose. The TSBC allows for observations on 69 behavior categories simultaneously. These behaviors reflect both mutually exclusive categories (e.g., eyes open/eyes closed; sitting/standing/walking/lying down) and concurrent behavioral categories (e.g., talking, working on task, staring into space). The specific behavioral codes of the TSBC range from the appropriate, such as working or socializing with others, to the inappropriate, such as screaming or disrupting others. Observations by trained raters lasted 2 seconds for each subject and they were randomly scheduled within each half-hour block.