UCSD Performance-Based Skills Assessment: Development of a New Measure of Everyday Functioning for Severely Mentally Ill Adults

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Abstract

Instruments to assess everyday functioning have utilized self-report, proxy report, clinician ratings, or direct observation of performance. Each of these methods has strengths and weaknesses. In this article we argue for the inclusion of performance-based measures of functional capacity in studies of severely mentally ill persons and describe a new measure, the UCSD Performance-Based Skills Assessment (UPSA). We administered the UPSA to 50 middle-aged and older outpatients with schizophrenia or schizoaffective disorder, and 20 normal comparison subjects. Participants' performance in five domains of functioning (Household Chores; Communication; Finance; Transportation; and Planning Recreational Activities) was assessed in standardized role-play situations. Administration of the UPSA required an average of 30 minutes to complete. Interrater reliability of ratings was excellent. Patients' performance was significantly more impaired than that of normal subjects. Among patients, the UPSA performance correlated significantly with severity of negative symptoms and of cognitive impairment but not with that of positive or depressive symptoms. The UPSA scores correlated highly with those on another performance-based measure. We believe that UPSA would be useful for assessing everyday functioning in severely mentally ill adults.

Keywords: Schizophrenia, disability, dementia, quality of life.

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Most instruments utilized in studies of interventions for patients with schizophrenia have focused on symptoms of psychosis (e.g., hallucinations, delusions, disorganized behavior) to the exclusion of deficits in social and instrumental functioning. While these latter features may be less dramatic, they represent patients' ability to function in the real world. Fundamental to testing the effectiveness of interventions for patients with schizophrenia is quantification of functional outcome as well as improvements in social disability. We believe that functional outcome should be related to those abilities or skills that are essential to an individual's ability to function independently in the community. These skills include general organization, communication skills, finance management, transportation, performance of household chores, medication management, and social interactions.

In this article, we discuss some of the challenges associated with the measurement of functional outcome among severely mentally ill individuals living in the community, describe the limitations of previous approaches to measuring outcomes, argue for the inclusion of performance-based outcome measures, and present preliminary data on the development of a new performance-based measure.

There are at least five approaches to measuring outcomes in terms of everyday functioning: (1) self-reports, (2) proxy (e.g., confidant, caregiver) reports, (3) clinician ratings, (4) direct observations of behavior in settings where patients live, and (5) performance-based measures that utilize tasks in clinical settings.

A wide variety of self-report measures of functioning have been extensively utilized in the field (e.g., regarding social and occupational adjustment; Weissman 1975; Schooler et al. 1979; Weissman et al. 1981). There is also general agreement that patients' perceptions of their own quality of life are central to the concept of quality of life (Meltzer 1992; Awad et al. 1997). There are several quality-of-life scales that are based on semistructured interviews (e.g., Quality of Life Scale, Heinrichs et al. 1984; Quality of Life Interview, Lehman et al. 1986, Lehman et al. 1993; Wisconsin Quality of Life Scale, Becker et al. 1993). There is, however, controversy regarding the valid-

ity of self-report measures for assessing functioning in severely mentally ill patients, particularly those with schizophrenia (Loew and Rapin 1994; Arfken 1997; Atkinson et al. 1997; Rohland and Langbehn 1997). Self-reports may be affected by patients' insight, values, comparisons with other states, and concurrent situational events (Williams 1994). Thus, patients' self-reports may be influenced by their psychopathology (e.g., depression, lack of insight), thereby distorting the very cognitive and emotional functioning, and social judgments, on which self-report instruments are based (Serban and Gidynski 1979; Morgado et al. 1991; Jenkins 1992; Barker et al. 1996; Atkinson et al. 1997). There may be little or no agreement between patients' and care providers' judgments of the patients' social relations and occupational aspects of patient functioning (Sainfort et al. 1996). Furthermore, functional ratings based on patients' behaviors in an interview setting may not directly relate to capabilities in a range of domains in the outside world.

Collateral reports have been employed in an attempt to increase the reliability of self-report measures. Evidence suggests, however, that a substantial proportion of middle-aged and elderly outpatients with schizophrenia are unable to provide the name of a person who can report on their daily functioning (Patterson et al. 1996). In addition, some studies (e.g., Beck et al. 1991), but not others (e.g., Dickerson 1997), suggest that collateral reports of patient functioning may be unreliable, further compounding problems with relying on only this method of data collection.

Clinician ratings of patient behavior are a part of many symptom assessments (e.g., Brief Psychiatric Rating Scale, Overall and Gorham 1962; Geriatric Depression Scale, Yesavage et al. 1983). These ratings typically rely on brief contact with the patient and focus on behaviors that may or may not be related to the patients' ability to function in the real world. Scales, such as the Social-Adaptive Functioning Evaluation scale, designed specifically for use with geriatric psychiatry inpatients (Harvey et al. 1997) are not useful for community-dwelling patients.

There have been few systematic large-scale studies based on direct observation of behavior among outpatients across different settings. Data collected in naturalistic environments would allow researchers to assess the actual performance of, and not simply the capacity to perform, everyday activities (Hamera and Brown 2000). In addition, these data would provide the basis for establishing the validity of other measures of everyday functioning. Unfortunately, the assessment of behaviors through direct observation of patients in a wide variety of settings, over periods long enough to provide representative data, while desirable, is likely to be extremely expensive and labor-intensive.

The limitations of the other approaches for evaluating outcome in community-dwelling patients with severe mental illnesses such as schizophrenia have led to a call for outcome instruments based on observable data (e.g., DeHaes et al. 1992; Jenkins 1992; Pavot and Deiner 1993). Performance-based measures present a number of attractive features, including less dependence on patient insight (leading to greater measurement reliability) and a potential for focusing on real-life skills that may be targets for interventions. These advantages may be tempered with potential pitfalls, including the use of contrived environments, which may bring the data's validity into question. A number of performance-based measures have been developed for use with cognitively impaired individuals (e.g., Structured Assessment of Independent Living Skills, Mahurin et al. 1991; Performance Test of Activities of Daily Living [ADLs], Kuriansky and Gurland 1976; Refined ADL Assessment, Tappen 1994; the ADL Situational Test, Skurla et al. 1988; Dressing Performance Scale, Beck 1988; Kitchen Task Assessment, Baum and Edwards 1993; Medicine Management Test, Gurland et al. 1994). Our group previously published promising results using the Direct Assessment of Functional Status (DAFS, Loewenstein et al. 1989), a performance-based measure originally developed for use with dementia patients. We found that the overall performance of middle-aged and elderly outpatients with schizophrenia was significantly more impaired than that of similarly aged normal comparison subjects (NCs) but appeared to be better than that reported in patients with dementia (Klapow et al. 1997; Patterson et al. 1998). On three of the seven subscales of the DAFS (Time Orientation, Grooming, and Eating), however, the schizophrenia patients did not differ significantly from the NCs. The DAFS, which requires about 40 minutes to administer to older schizophrenia patients (Klapow et al. 1997), is primarily intended for an assessment of ADLs, which are more important among individuals with dementia, but does not assess social functioning, which tends to be markedly affected in patients with schizophrenia.

Limited work has been conducted on performance-based measures for psychiatric patients other than those with dementia. While a few direct measures of social functioning (e.g., Bellack et al. 1990) and other functional dimensions have been developed for mentally ill patients, the available instruments have generally been narrow in their focus, require considerable time commitments for both participants and researchers, and may be impractical for use in large-scale clinical trials. For example, Bellack and colleagues (1994) developed a problem-solving battery for schizophrenia patients that assessed the ability to generate solutions to problems, the ability to evaluate the effectiveness of solutions, and the ability to implement solutions in a role-playing format. Bellack and colleagues (1996) have also developed a behavioral assessment strategy, the Family Problem-Solving Task, and a related coding system. Each of

these useful instruments is relatively lengthy, with a rather narrow focus.

Based on our experience and previously published literature, our group has developed a performance-based measure appropriate for use with middle-aged and elderly community-dwelling patients with schizophrenia. We believe that this measure would be applicable to other severely mentally ill adults too. Below we briefly describe the development of this new instrument, the UPSA, compare the UPSA performance of a sample of older schizophrenia patients with that of NCs, and relate the patients' UPSA performance to their degree of psychopathology and to other outcome measures. We hypothesized that (1) the schizophrenia patients would perform worse in all domains of functional capacity on the UPSA compared to NCs; (2) patients with more severe symptoms of psychopathology would demonstrate greater deficits on all UPSA domains; and (3) performance on the UPSA would be more strongly related to a performance-based measure developed for dementia patients (i.e., the DAFS) than to a generic self-report measure of outcome (i.e., the Quality of Well-Being scale [QWB, Kaplan et al. 1989]).

Methods

Sample Selection. The sample comprised 50 middle-aged and elderly patients with a *DSM–IV* (American Psychiatric Association 1994) diagnosis of schizophrenia or schizoaffective disorder and 20 NCs who were participants at the Intervention Research Center (IRC) for Psychosis in Older Adults at the University of California, San Diego (UCSD). Details of the clinical assessments

have been described previously (Jeste et al. 1995). Briefly, ambulatory subjects who could complete the IRC assessments were included. Exclusion criteria were seizure disorder, medical illness severe enough to require current hospitalization, history of head injury followed by loss of consciousness for at least 30 minutes, and diagnosis of dementia or current substance abuse or dependence that would meet *DSM–III–R* or *DSM–IV* (American Psychiatric Association 1987; American Psychiatric Association 1994) criteria. The patients were recruited from the Veterans Affairs (VA) San Diego Healthcare System, the UCSD Medical Center, the San Diego County Public Mental Health Services, and the San Diego community. After a complete description of the study was provided, written informed consent was obtained. Psychiatric diagnoses were based on the Structured Clinical Interview for *DSM–III–R* or *DSM–IV* (Spitzer et al. 1990; First et al. 1995). Research diagnoses were determined at psychiatric staffing meetings, which included two board-certified psychiatrists. All the subjects were psychiatrically, physically, and pharmacologically stable (i.e., they had had no major clinical changes for at least several weeks prior to the time of their assessment). NCs were recruited from among volunteers at the VA San Diego Healthcare System and through local advertisements in San Diego County.

Subject characteristics are presented in table 1. The patient and comparison groups were similar in terms of gender and education. The patients were significantly younger than the NCs (by an average of 4.9 years). This difference could result in an underestimation of the degree

Table 1. Demographic characteristics of schizophrenia patients and normal comparison subjects

Demographic measures	Schizophrenia patients (n = 50)	Normal comparison subjects (n = 20)	t or χ²	df	p
Age (yrs), mean (SD)	56.0 (8.5)	60.9 (7.6)	2.37	68	0.023
Education (yrs), mean (SD)	13.0 (2.3)	13.3 (2.6)	0.34	68	0.737
Gender			0.02	1	1.000
Male, n (%)	21 (42)	8 (40)			
Female, n (%)	29 (58)	12 (60)			
Marital status			29.70	2	0.001
Never married, n (%)	14 (28)	1 (5)			
Divorced-widowed, n (%)	31 (62)	4 (20)			
Currently married, n (%)	5 (10)	15 (75)			
Ethnicity			5.32	1	0.028
White, n (%)	37 (74)	9 (45)			
Other, n (%)	13 (26)	11 (55)			
Living situation			30.33	5	0.001
Alone, n (%)	5 (10)	3 (15)			
With someone, n (%)	7 (14)	17 (85)			
Assisted care facility, n (%)	38 (76)	0 (0)			

Note.—SD = standard deviation.

of impaired functioning among the patients. In addition, compared to the NCs, the patients were more likely to be white, unmarried, and living in a board-and-care setting. The patients and NCs did not differ on physical comorbidity. The patients had been diagnosed with schizophrenia for an average of 29 years, and 91 percent were currently taking neuroleptics. Not surprisingly, the patients scored significantly worse on all scales of psychopathology and cognitive status compared to the NCs (table 2).

Measures

UPSA. Our goal was to develop a performance-based measure of capacity to perform everyday functioning that was reliable and had face and construct validity. To identify areas of measurement, we sought information from clinicians, patients, and published reports, and reviewed previously developed instruments. We also obtained input from occupational therapists, nurses, and social workers on the staff as well as from the Community Advisory Board of our IRC (this board includes research participants, family members of patients, members of patient advocacy groups, and other community representatives). We focused on skills that we believed were necessary for functioning in the community. The UPSA was designed to assess skills in five areas: Household Chores, Communication, Finance, Transportation, and Planning Recreational Activities. The specific task, such as planning a trip to the beach (see later), might not be critical to everyday functioning, but it reflects general abilities (e.g., the ability to plan and organize) that are important components of independent living. In addition

to the UPSA, we have developed two other performance-based measures that focus on the patients' ability to manage their own medications (i.e., the Medication Management Ability Assessment) and interact socially (i.e., the Social Skills Performance Assessment). These latter two measures are described elsewhere (Patterson et al., in press; Patterson et al., in press). Subjects were tested in our offices or in the patients' residential settings (e.g., patients' homes or board-and-care homes) by a research assistant with a B.A. or M.S. The UPSA was designed to be administered by nonclinicians (i.e., trained lay individuals). Training requires several hours, depending on the rater's background and skills (contact the first author for training information and the scale).

The UPSA involves role-play tasks similar in complexity to situations that an older community-dwelling person is likely to encounter. Below we describe the five areas that were tested.

Household Chores (cooking and shopping). Subjects are provided with a recipe for rice pudding and asked to prepare a written shopping list. They are presented with an array of items in a mock grocery store (e.g., milk, vanilla, cereal, soup, rice, canned tuna, cigarettes, a can of beer, crackers), asked to pick out the items that they would need to prepare the pudding, and told to write down the items that they would still need to buy. Points are given for each correct item on the shopping list. This task yields raw scores ranging from 0 to 4, and it takes about 5 minutes to complete.

Communication (telephone calls). Participants are provided with a telephone and asked to make several calls.

Table 2. Scores on measures of psychiatric and cognitive status

Clinical measures	Schizophrenia patients ($n = 50$)	Normal comparison subjects ($n = 20$)	t or χ^2	df^1	p
Duration of illness (yrs), mean (SD)	29.4 (9.8)	NA	NA	NA	NA
Patients on neuroleptics, n (%)	46 (92)	NA	NA	NA	NA
Daily neuroleptic dose, median mg CPZE[2]	375.6	NA	NA	NA	NA
Physical comorbidity, number of Axis III diagnoses, mean (SD)	0.7 (0.47)	0.6 (0.48)	0.11	47	*ns*
SAPS total, mean (SD)	6.1 (3.8)	0.8 (1.0)[3]	−8.68	38	0.001
SANS total, mean (SD)	9.2 (4.0)	1.4 (1.5)[3]	−9.21	24	0.001
HAM–D, 17-item, total, mean (SD)	9.6 (4.8)	2.1 (2.1)[3]	−7.80	25	0.001
MMSE total, mean (SD)	26.1 (3.6)	29.1 (1.2)[4]	−4.54	47	0.001

Note.—CPZE = chlorpromazine equivalent; HAM–D = Hamilton Rating Scale for Depression; MMSE = Mini-Mental State Examination; NA = not applicable; *ns* = not significant; SANS = Scale for the Assessment of Negative Symptoms; SAPS = Scale for the Assessment of Positive Symptoms; SD = standard deviation. Data for patients and normal subjects are reported in original units. Statistical tests were conducted after appropriate transformations.
1. Variation in *df* is because of missing data and the use of separate variance estimates.
2. Average Daily Neuroleptic Dose (mg chlorpromazine equivalent or CPZE, Jeste and Wyatt, 1982).
3. Log_{10} transformed.
4. Reflected log_{10} transformed.

They are asked to use the telephone to get help as if there were an emergency (the appropriate response is to dial 911). An additional task is to call "Information" to get a specific telephone number and then dial it from memory. Subjects are also given a medical appointment confirmation letter to read and then asked to call the hospital to reschedule the appointment. Finally, subjects are asked to tell the interviewer how, according to that letter, they should prepare for the medical appointment (e.g., fasting for blood draw) and what two items they need to bring with them to the doctor (e.g., insurance card, list of medications). The number of correct answers is calculated. There are nine Communication subtasks that yield raw scores ranging from 0 to 9 and take about 5 minutes to complete.

Finance (counting change and paying bills). Subjects are provided with coins and bills and are asked to count out certain amounts (e.g., $12.17, $6.73, $1.02) and make change from $10. They are then provided with a real bill from the local utility company, the San Diego Gas and Electric Company (SDG&E), and are required to make out a check. We suggest that a bill from a local utility company of similar complexity to the one used here be substituted in different areas. Points are given for each correct element of this process (e.g., the check is made out to SDG&E, the written amount corresponds to the amount of the bill, and the check is signed). This task yields raw scores ranging from 0 to 6 and takes about 5 minutes to complete.

Transportation (use of public transportation). Subjects are told that they need to ride a bus to National City, a suburb of San Diego, from the VA Medical Center. (We suggest that geographically appropriate public transportation information of similar complexity be substituted in different areas.) Patients are provided with a bus schedule prepared by the San Diego Transit Authority and asked how much it would cost, what telephone number to call for schedules and other information, which bus they would ride, and where they would get off the bus to transfer to another bus line or to ride the trolley. This task yields raw scores ranging from 0 to 6 and takes approximately 7 minutes to complete.

Planning Recreational Activities (outings to beach and zoo). Subjects participate in two role-play scenarios that are appropriate to the San Diego area. The exact content of these scenarios should be modified to make them appropriate to the geographic region where this test is to be administered (e.g., a public park instead of the beach).

In the first scenario, subjects are asked to read a story about 2 minutes long that describes a popular beach in San Diego County, the activities that take place on the beach, and how to get there. Subjects are then told to imagine that they will be going on an outing to this beach on a sunny, warm day and that they need to plan how they would get to the beach, what they would do once there, and what five

items they would need to take or to wear in order to comfortably spend the whole day at the beach. One appropriate answer would be "I would take a bus to the beach. I would take a towel, a sun umbrella, sunscreen, sunglasses, a bathing suit, drinking water, a picnic lunch, and a bus pass. I would lie in the sun, fish, and swim." One inappropriate answer would be "I would walk from my residence to the beach (30 miles one way), take a stove to cook on, and take my ski boat and lifesaver rope."

In the second scenario, subjects are told to imagine they are going to the zoo. They are asked to read text that has information on zoo hours and location, lists current attractions (e.g., Polar Bear Plunge, giant pandas), and says that the weather will be cool with rain likely. Participants are asked to report on the zoo hours and the current attractions and to list five items they would need to take or to wear in order to spend the day there. One appropriate list of items would be "walking shoes, warm jacket, umbrella, money for lunch, camera, binoculars." One inappropriate list of items would be "take sunscreen (patients often provide perseverative answers appropriate to the beach outing); wear shorts, straw hat, or rollerblades."

Points are given for each appropriate response in the following way: First Scenario, one point is given for how the person would get to the beach, one point for every appropriate activity (up to two), two points each for every appropriate item (up to five), for a total of 13 points; Second Scenario, one point each for the zoo opening and closing time, one point for each zoo attraction named (up to two), and two points each for naming appropriate items (up to five), for a total of 14 points. The number of correct answers is calculated. Raw scores for the two scenarios range from 0 to 27. This portion of the UPSA takes approximately 7 minutes to complete.

Computation of scores. Total scores for each subscale are calculated by transforming raw scores into a 0-to-10 scale, yielding comparable scores on each scale. In order to have a 100-point summary score, each subscale score is multiplied by 2, yielding subscale scores ranging from 1 to 20. A summary UPSA score is calculated by summing these five scores, resulting in total scores ranging from 0 to 100. The total time needed for completing the UPSA is approximately 30 minutes.

Because we sought to develop a relatively brief assessment, we made no attempt to be overly inclusive. However, in the course of development of this scale we did test (and decided to drop) other dimensions of functioning that either were found to be highly correlated with the tasks that were retained or were not missed by any subjects (e.g., instrumental skills such as washing the face and counting 6 cents in change).

Scales used for external validation. In order to test the concurrent validity of UPSA, we administered two additional measures of functioning that were available in

the IRC. One (the DAFS) is a performance-based measure, while the other is based on self-report (the QWB).

The DAFS assesses performance in seven domains (i.e., time orientation, communication, transportation, finance, shopping, grooming, and eating) and yields a single summary score (higher scores indicate better functioning). The DAFS was developed for use with dementia patients (Loewenstein et al. 1989) and has been utilized with older patients with schizophrenia by our group (Klapow et al. 1997; Patterson et al. 1998).

The QWB is a self-report scale that yields a single score ranging from 1.0 (perfect health with no symptoms) to 0.0 (death). The QWB is made up of four components: mobility, social activity, physical health, and a weight for the worst symptom reported. We have previously reported on the utility of this scale with older schizophrenia patients (Patterson et al. 1996; Patterson et al. 1997).

Other measures. The Scale for the Assessment of Positive Symptoms (SAPS) and the Scale for the Assessment of Negative Symptoms (SANS, Andreasen and Olsen 1982) were employed to evaluate the severity of the symptoms of schizophrenia. Depressive symptoms were assessed using the 17-item Hamilton Rating Scale for Depression (HAM–D, Hamilton, 1960). Finally, the Mini-Mental State Examination (MMSE, Folstein et al. 1975) was used to estimate the degree of global cognitive impairment. All the rating scales utilized had a high degree of interrater reliability (Intra Class Correlation (ICC) > 0.76) (McDowell and Newell 1996). In addition, we utilized the cumulative number of Axis III diagnoses from *DSM–III–R* or *DSM–IV* (American Psychiatric Association 1987; American Psychiatric Association 1994) as a measure of physical comorbidity.

Statistical Analyses

Statistical analyses were performed using SPSS/PC+ Version 6.0 (Norusis 1993). Data were examined for nor-

mality of distribution, and where violations of normality were detected, appropriate transformations were made to improve the normality of distribution ($-\log_{10}$ for SAPS, SANS, and HAM–D scores; and reflected $\log_{10}$ for MMSE scores) for further statistical analyses. To evaluate the homogeneity of variance, we used Levene's test (Norusis 1993) and applied appropriate statistics. Categorical data were analyzed using Pearson's chi-square tests. To determine which of the selected measures "predicted" patients' total UPSA scores, a hierarchical regression analysis was conducted. All the statistical tests were two-tailed.

Results

Of the 50 patients assessed, 37 were tested in our offices and 13 in their residences. These two subgroups did not differ on age, education, psychopathology rating scale scores, or UPSA total or subscale scores. All of the NCs were evaluated in our offices. Our two research assistants jointly administered the UPSA to a randomly selected sample of 20 patients. The ICC for the total scores between these raters was 0.91 ($p < 0.001$), indicating excellent interrater reliability.

Comparison of Patient and NC Performance on the UPSA. We compared the mean scores of our schizophrenia patients and NCs on each of the five domains of functioning, and the total scores. The patients' performance was significantly more impaired compared to that of NCs in all areas of functioning (table 3). Because this sample of schizophrenia patients was significantly younger than the NCs, we repeated these analyses covarying for age. All the comparisons remained significant in these analyses.

Relationship of the UPSA Performance to That on Other Measures. To examine the concurrent validity of

Table 3. Comparison of schizophrenia patients' and normal comparison subjects' performance on the UPSA

UPSA subscale[1]	Schizophrenia patients (*n* = 50), mean (SD)	Normal comparison subjects (*n* = 20), mean (SD)	*t*	*df*	*p*
Household Chores	9.7 (8.4)	17.5 (3.0)	5.69	68	0.001
Communication	10.9 (6.1)	18.6 (1.3)	8.37	68	0.001
Finance	10.7 (7.1)	18.1 (2.2)	6.65	68	0.001
Transportation	14.1 (6.3)	19.7 (1.5)	5.89	68	0.001
Planning Recreational Activities	13.4 (3.9)	18.8 (1.2)	8.90	68	0.001
UPSA total score[2]	58.8 (27.1)	92.6 (5.5)	8.40	68	0.001

Note.—SD = standard deviation; UPSA = UCSD Performance-Based Skills Assessment.
[1] Possible range of scores for each subscale: 0–20.
[2] Possible range for total score: 0–100.

the UPSA, we correlated the total score on the UPSA with that on another performance-based measure (the DAFS) and on a self-report measure (the QWB) among patients only. The performance on the UPSA was strongly correlated with performance on the DAFS ($r = 0.86$, $p <$ 0.001). In contrast, the correlation between the UPSA and QWB scores was nonsignificant ($r = 0.28$, $p > 0.05$).

Relationship Between UPSA Performance and Patient Characteristics. To determine the relative importance of the various demographic, psychiatric, and cognitive variables in "predicting" the schizophrenia patients' UPSA total score, we conducted a multiple regression analysis. Using a hierarchical procedure, we entered five blocks of predictor variables: (1) demographics (i.e., age, gender, and education); (2) illness burden (i.e., duration of illness and current daily neuroleptic dosage in mg chlorpromazine equivalent (CPZE, Jeste and Wyatt 1982); (3) severity of psychiatric symptoms (i.e., SAPS, SANS, and HAM–D scores); and (4) global cognitive status (i.e., MMSE scores). Together these variables accounted for 62 percent of the variance in the UPSA performance (F = 6.42, $p < 0.001$) (table 4). Demographics and illness burden did not contribute significantly to the equation. Greater severity of negative symptoms and worse cogni-

tive status were significantly related to poorer UPSA performance.

Discussion

This report describes the development of a new performance-based measure of functional capacity designed for use with community-dwelling older schizophrenia patients. Consistent with our hypotheses, the patients did significantly worse than the NCs on all five domains of the UPSA; furthermore, the UPSA scores correlated with those on another performance-based instrument (the DAFS) but not with those on a self-rated one (the QWB). Interestingly, the patients' UPSA performance was statistically predicted by the severity of their global cognitive impairment and negative symptoms but not by that of positive symptoms.

Although we studied only middle-aged and elderly patients with schizophrenia and schizoaffective disorder, the UPSA may also be useful for other severely mentally ill patients, including younger adults, living in the community. The UPSA samples subjects' capacity to perform a variety of activities associated with community living (i.e., Household Chores; Communication; Finance; Transportation; and Planning Recreational Activities)— skills that are critical for functioning in the community.

Table 4. Regression of UPSA total score on demographic variables, illness characteristics, and clinical status in a sample of schizophrenia patients ($n = 45$)[1]

Variables to enter	Step 1 beta	Step 2 beta	Step 3 beta	Step 4 beta
Age (yrs)	–0.208	–0.150	–0.188	–0.087
Gender	–0.041	–0.037	–0.001	–0.006
Education (yrs)	0.256	0.241	0.061	0.003
Duration of illness (yrs)		–0.190	–0.187	–0.159
Average daily neuroleptic dose (mg CPZE)[2]		–0.069	–0.236	–0.130
SAPS total[3]			–0.199	–0.236
SANS total[3]			–0.652**	–0.376*
HAM–D, 17-item, total[3]			0.212	0.181
MMSE total[4]				–0.468*
r^2	0.106	0.140	0.495	0.623
r^2 change		0.034	0.355	0.127
$F_{(3,41)}$	1.624			
$F_{(5,39)}$		1.272		
$F_{(8,36)}$			4.415***	
$F_{(9,35)}$				6.418***

Note.—CPZE = chlorpromazine equivalent; HAM–D = Hamilton Rating Scale for Depression; MMSE = Mini-Mental State Examination; SANS = Scale for the Assessment of Negative Symptoms; SAPS = Scale for the Assessment of Positive Symptoms; UPSA = UCSD Performance-Based Skills Assessment.
[1] Five patients were dropped from this analysis because of missing data.
[2] Average daily neuroleptic dose (mg chlorpromazine equivalent or CPZE, Jeste and Wyatt 1982) transformed using square root.
[3] SAPS, SANS, and HAM–D scores transformed using $\log_{10}$.
[4] MMSE score transformed using reflected $\log_{10}$.
* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

The measurement of outcomes in studies of pharmacological and psychosocial treatments requires inclusion of multidimensional measures. We previously reported on the use of QWB, which is designed to assess the health-related quality of well-being in a broad range of subjects (Patterson et al. 1996). The performance on the UPSA did not correlate significantly with self-reported QWB scores. While we still believe that self-reported measures are valuable parts of outcome assessment, they may lack specificity regarding areas of functioning that are essential for severely mentally ill persons to live independently (e.g., handling finance, using public transportation) and that may change as a result of pharmacologic or psychosocial interventions. The UPSA has several advantages over self-report and collateral-report measures. For example, the UPSA relies on an individual's performance rather than self-report and is, therefore, less vulnerable to the influences of insight, values, comparisons with other states, or concurrent situational events. Also, there is no dependence on collateral reports, which are at times difficult to obtain and may not be entirely reliable (Dickerson 1997).

The UPSA has specific advantages over other performance-based instruments (e.g., the DAFS) for assessing everyday functioning in psychiatric patients, such as those with schizophrenia. The UPSA taps into problems typical for severely mentally ill patients, unlike the DAFS, which assesses ADLs and cognitive deficits—problems more critical when evaluating individuals with dementia.

The UPSA tasks used represent a compromise between the conflicting needs to be both comprehensive and brief. One important step in the further refinement of our tests of everyday functioning will be to determine, using much larger and more diverse survey samples, which areas the patients, their caregivers, and their health care providers feel are important to assess.

We should note the limitations of our approach. The UPSA assesses functional abilities in an artificial setting and thus may not be equivalent to a subject's performance in the real world. The distinction between capacity and real-world performance is an important one to make, as assessment instruments measure different domains of functioning. Birchwood (1990) stated that a capacity deficit involves the absence or loss of a particular skill, whereas a performance deficit involves the nonuse of an existing skill. The UPSA tests capacity for functioning in a setting that approximates the real world. Nygard and colleagues (1994) reported that dementia patients tested in unfamiliar surroundings had more impaired performance than those tested in familiar surroundings. Differences in performance estimates among national surveys of elderly individuals have been attributed partly to a lack of attention to what Weiner and colleagues (1990) termed the contextual elements of the performance, which include intrapersonal elements such as cognitive and physical abilities, interpersonal elements such as interactions with caregivers during task performance, and environmental elements such as the layout of the environment. This conceptualization has particular utility for psychiatric patients. Because it is likely that multiple pathways lead to similarly impaired performance, one of the challenges for future research will be to determine what portion of the variance in performance, and the difference between capacity and performance, is related to specific psychiatric symptoms, medication side effects, or physical disabilities—while attending to contextual elements. A contextual perspective also suggests the need to combine this performance-based measure with other assessment methods—including self-report measures, informant-based instruments, and clinician ratings—to establish criterion-based validity.

In addition, the relatively small sample included in this study precludes the use of multivariate statistics to simultaneously examine the relative contributions of different variables, and the examination of subgroup differences (e.g., men vs. women, early- vs. late-onset psychosis). It would have been desirable to have included other commonly used outcome measures as indicators of concurrent validity (e.g., Heinrichs et al. 1984). Finally, the tasks included in the UPSA may not be relevant to institutionalized populations. Because of the progressive deinstitutionalization of psychiatric patients over the past several decades, most of the patients with schizophrenia currently reside in the community (Palmer et al. 1999; Cohen et al. 2000). The UPSA was developed specifically for use with outpatient populations.

One of the primary goals in the development of the UPSA is to assess the effectiveness of different interventions. Future work is needed to test the sensitivity of the UPSA to treatment-induced changes in patient functioning. In addition, studies should determine how useful the UPSA is in other psychiatric disorders, including depression, anxiety, and early stages of Alzheimer's disease.

The measurement of the impact, if any, of treatments on patient functioning has become increasingly important for evaluating the cost-effectiveness of treatments. People who purchase health care, third-party payers, managed care programs, and primary care physicians are increasingly requiring evidence of the effectiveness of pharmacological and psychosocial interventions before approving such treatments. As the ultimate goal of interventions is to return patients to full functioning, there is a need for measures to assess the ability of individuals to (re)integrate into community settings . Measures such as the UPSA, with continued refinement, should help serve this purpose.

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