The Life Skills Profile: A Measure Assessing Function and Disability in Schizophrenia

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Abstract

We review limitations of representative measures of function and disability associated with schizophrenia and specify requirements of a suitable measure for service evaluation: It should reliably and validly assess constructs relevant to survival, function, and adaptation in the community. Additionally, it should be brief, comprise specific and jargon-free items assessing distinct behaviors, and therefore be capable of completion by family members and community housing managers as well as by professional staff. The initial development of such a measure, the 39-item Life Skills Profile (LSP), with its five scales, is described. We report data to suggest that it is likely to be a measure of considerable utility both in research studies and in defining and assessing clinical services.

Wing (1978) has suggested four sources of social impairment in schizophrenia emerging from (1) acute symptoms (e.g., florid features such as delusions and hallucinations), (2) chronic symptoms (e.g., blunted affect, poverty of speech), (3) secondary handicaps (e.g., institutionalization), and (4) extrinsic disadvantages (e.g., premorbid characteristics such as poor social supports) which would handicap individuals even in the absence of schizophrenia.

A conceptual model for psychiatric rehabilitative assessment and intervention that has been adapted usefully from physical medicine (Anthony 1980; Anthony and Liberman 1986) comprises four levels: (1) pathology (i.e., any central nervous system lesions or abnormalities etiologically linked to psychotic symptoms); (2) impairment (i.e.,

any psychophysiological abnormality linked to underlying pathology such as "positive" or "negative" schizophrenic symptoms); (3) disability (i.e., any restriction in normal ability to perform activities associated with an impairment); and (4) handicap (i.e., a societal disadvantage, such as unemployment, arising from that disability). While pathology may be amenable to technological investigation, and impairment requires clinical assessment, functional assessment is usually performed at the level of disability. These conceptual models underpin our development of a measure assessing function and disability in those with schizophrenia.

Effective treatment for schizophrenia requires not only therapies to relieve acute symptoms but rehabilitative therapies addressing associated dysfunction and disability. Until recently, research has been relatively preoccupied with comparative evaluations of symptomatic treatments, with effectiveness being assessed on measures designed specifically to assess the symptoms and signs of acute schizophrenia. While schizophrenia rehabilitation is clearly not recent, the claimed successes of family management programs (Falloon et al. 1987) and of social skills training (Wallace and Liberman 1985), have encouraged therapeutic optimism about rehabilitative strategies. Such advances, together with deinstitutionalization proceeding actively in most Western countries, suggest that there is a distinct need to be

able to chart accurately the *general* functioning of those with schizophrenia over time, as against measurement of acute symptoms, when severity of acute symptoms and general functioning may be quite independent of each other.

Requirements of a Measure of Function and Disability

In studying the effects of transferring individuals with schizophrenia from institutions in Australia to area-based and largely community-focused services, we had difficulty in finding an appropriate measure of function and disability with particular relevance to schizophrenia, in reference to a number of specific requirements that will be briefly noted.

First, the measure should focus on those aspects of functioning that affect survival and adaptation in the community. Second, it should not focus on excessively fine details of behavior that might be required for problem listing in a living skills' assessment schedule (see Anthony and Farkas 1982). Instead, it should assess broad constructs of relevance to those in charge of designing and providing rehabilitative programs, and give estimates of key disabilities. Third, it should be able to be completed by both professional and nonprofessional raters (be they family members, case managers, or those in charge of hostels and boarding houses), so that items and scoring are jargon-free, simply expressed, and unlikely to elicit pejorative or other distorting value biases. Fourth, because of other recognized biases affecting self-report scales (e.g., social desirability, acquiescence, defensiveness, and deviant style), and because the potential subjects would generally have severe psychiatric disorder, it

should not rely on self-reports but instead assess observable behaviors. Fifth, it should be brief and capable of ready administration by any mental health care service, without requiring extra staff or specially trained research personnel to administer. Sixth, it should meet appropriate standards of reliability and validity, and be sensitive to at least modest changes in function and impairment. Seventh, each item should bear on a single distinct behavior (e.g., fail to wash) rather than attempt to generalize (e.g., poor hygiene) when individuals might have distinctly varying component characteristics within the same dimension. Broad dimensions would subsequently be generated from derived subscales. Eighth, the scores should be derived in such a way that the results would be perceived as both intelligible and relevant to mental health workers and service users.

Recognizing that some people with schizophrenia are judged as coping in the community in the most deprived circumstances, while others are judged as surviving poorly despite the absence of evident morbidity, we accepted the notion that any judgment of community survival depends ultimately on there being a niche that will accommodate any person's particular mix of abilities and disabilities. Adaptation and survival in the community may, in fact, relate as much to the responses of caregivers as to the individual's disabilities. Such a view suggests that a scale assessing function should also attempt to assess if the component disabilities are maladaptive in the social setting, particularly as they affect caregivers, be they family members or case managers. Attempts to assess that component (burden of care) have been made previously,

for example, in the Social Behaviour Assessment Schedule (Platt et al. 1980) and the Family Questionnaire (Barrowclough and Tarrier 1987).

Review of Representative Measures

In arguing for the development of a new measure, we should review some of the perceived limitations of developed measures. Since Wallace (1986) has reviewed a large number of measures assessing functional living skills of chronically mentally ill subjects, our review focuses on representative approaches, on measures that have been extensively used, and on several recently developed measures. Again, our review covers global measures rather than the more molecular rehabilitation outcome measures that assess focal or target behaviors, and that have been comprehensively reviewed by Anthony and Farkas (1982).

The Social Behavior Scale (Wykes and Sturt 1986) requires a rater to make judgments about behaviors and symptoms by interviewing an informant. The judgments are complex, requiring a sophisticated or trained interviewer/rater, and the questions often have the potential to confound a number of dimensions, while the resulting "global" nature of the ratings does not allow for a finer indication of the person's functioning. On published data, the scale's sensitivity to change does not appear high, and sensitivity may have been sacrificed in favor of excellent test-retest reliability. To make the scale more attuned to community living would require adding some items addressing relationships with different groups of people, while items addressing symptoms like panic attacks and phobias appear to be of no specific

relevance to patients with schizophrenia. Four reliabilities have been established for individual items of the schedule: an interrater agreement of 84–100 percent; an interinformant agreement of 70–90 percent; a test-retest agreement of 72–96 percent; and an intersetting agreement of 71–97 percent. Validity of the Social Behavior Scale has not as yet been shown.

The Disability Assessment Scale (Schubart et al. 1986) was developed as part of a World Health Organization project. Ratings are generated from information given by the person who has had the most contact with the patient over the last month. Even more than for the Social Behavior Scale, the questions are an amalgam of features, somewhat ambiguous in phrasing, and with the potential to create difficulties for the untrained rater. Some of the items (assessing family life and parental role) would apply only to a minority of schizophrenic subjects. Interrater reliability for the items was high with coefficient Kappas ranging from 0.82 to 0.85 for the items, while some indication of the validity is given by the correlation of 0.79 between the scale's global assessment score and that of psychiatrists' ratings.

The Global Assessment Scale (Endicott et al. 1976) provides a 0–100 rating of the lowest level of recent functioning. Because of the global nature, it is not possible to determine if the rated level reflects symptoms or aspects of more general functioning. Such blurring impairs the usefulness of the overall score, as well as leaving the carers with minimal information about the source of dysfunction. A scale with similar properties and deficits is the Health-Sickness Rating Scale (Luborsky 1975), developed for psy-

chotherapy research at the Menninger Clinic.

The Katz Adjustment Scales (Katz and Lyerly 1963) constitute an extensively used set of scales which includes self-reports as well as ratings made by relatives or other close informants, assessing symptoms, social behavior, free-time activity, and socially expected activities. The subscales of the Katz Adjustment Scales were claimed to have moderate to very good internal consistency and reasonable validity as indicated by agreement with clinical judgment and in defining types that show differential drug response, while subsequent tests of its psychometric properties have been summarized by Wallace (1986). The scales would need many symptom questions to be removed to generate a general social impairment scale, while the community living questions are too centered on patients living in a family situation. The item "dresses and takes care of himself," for example, is the only one to inquire directly about self-care.

The Social Adjustment Scale (Weissman and Paykel 1974) provides a small number of global judgments from a trained rater following a 1-hour semistructured interview. While there is a large list of items, the breadth of the Social Adjustment Scale is such that the important issue of living skills is addressed in a single item, while cognitive functioning is not assessed. Further, areas like "conjugal and nonconjugal sexual functioning" are subject to the inaccuracies of self-report strategies and are probably of priority to only a minority of schizophrenic subjects. Weissman et al. (1981) noted that agreement between informants was very high, while Wallace (1986) has noted studies of its capacity to dis-

criminate patient groups and of its concurrent validity.

The Progress Evaluation Scales (Ihilevich and Gleisner 1982) were developed for use by community mental health services. The rater, self or other, provides global judgments for seven areas such as "family interaction" and "use of free time." While the scales are extensively researched and seem to be both useful and well received, their global emphasis and content (omitting areas such as self-care, cognitive functioning, and living skills) make them inadequate for measuring functioning in the community.

The Social Behaviour Assessment Schedule (Platt et al. 1980) was designed to reflect Platt's views on social performance and how it might best be assessed. The schedule assesses the burden on others of behaviors and social performance. Thus, a valuable part of the scale is that it assesses the distress caused to the informant by various behaviors. It requires that a close informant be given a semistructured interview by a well-trained interviewer. The schedule is lengthy and time-consuming, but a short version can be created by omitting sections. It is difficult to know whether the 3-point ratings are ideal for detecting change, although the behavior and social performance summary scores have been shown to pick up improvement across a period from 2 weeks before admission to 14 weeks after admission (Platt et al. 1981). Interrater reliability for total scores (all in excess of 0.9) and for individual items (most in excess of 0.7), however, is highly satisfactory.

The Morningside Rehabilitation Status Scale (Affleck and McGuire 1984) was designed as a brief, broadly acceptable measure to assess the "main areas of change

relevant to the rehabilitation of psychiatric patients." The rater, someone well informed about the patient, provides four global ratings (dependency, occupation and leisure activity, social isolation, and current symptoms). Like other global scales, a number of different features can contribute to a given score. The scale's validity and sensitivity to change are still open questions, but its reliability is adequate, with interrater correlations on the four scales of 0.90, 0.74, 0.68 and 0.74.

The Scale for the Assessment of Negative Symptoms (Andreasen 1982) requires 30 items to be rated following observation of the patient as well as interviews with the patient and informants. Symptom complexes and individual symptoms are described, after which a 0–5 rating is requested. High interrater reliability was established. Because many items require a complex judgment that involves a number of dimensions, the format is probably too sophisticated for the measure's general application. While a number of important areas are covered (e.g., poor eye contact, recreational interests), some are assessed too globally (e.g., one question covering grooming and hygiene), while particular symptoms are possibly given undue emphasis (e.g., thought blocking, lack of vocal inflections).

Wallace (1986, p. 619) offered a summary statement to his review of available instruments: that "no one of them is wholly adequate for assessing functional living skills." Because of such limitations noted in our brief overview of representative measures, we sought to develop an improved measure and now describe the development of our Life Skills Profile (LSP).

Methods

We generated a large number of items by consultation with a wide variety of people involved in the care of those with schizophrenia (including psychiatrists, nurses, other mental health professionals, boarding house proprietors, and relatives), as well as by review of items used in a number of published and unpublished measures. In wording items, we focused on specific behaviors (e.g., "never bathes," "never changes clothes") rather than general dimensions (e.g., "difficulties with hygiene and dress") to reduce the risks associated with too global a judgment about component behaviors (e.g., someone having difficulties with hygiene but not dress, or having problems with hygiene only in certain circumstances). We chose 4-point ordinal ratings of each item, with specific anchor points. For example, the first item asks: "Does this person generally have any difficulty with initiating and responding to conversation?" and the specific anchor points and ratings are "no difficulty with conversation" (1), "slight difficulty with conversation" (2), "moderate difficulty with conversation" (3), and "extreme difficulty with conversation" (4).

To assess the impact or burden on the rater (putatively the caregiver or case manager), we required raters to judge whether each itemized behavior was personally "hard or not hard" for them to take—that is, whether it was personally judged as "intolerable, unacceptable, or difficult to take."

Items and instructions were then scrutinized to reduce potential redundancy and to check clarity, and several pilot studies were undertaken before a final set of 54

items was generated. We then sought to collect data on a sufficiently large number of subjects to allow a principal component analysis to be done. We requested relatives, boarding house proprietors, and/or professional workers to complete the provisional measure for those judged to have a clear and stable case record diagnosis of schizophrenia, subject to the rater having known the patient over time. We collected data on patients in a wide variety of urban and rural community settings in New South Wales and attempted to have multiple raters for as many subjects as possible so that we could determine the utility of professional and nonprofessional raters as well as interrater reliability coefficients. The instruction required raters to complete the form as "you assess....'s *general functioning,* i.e, not during crisis or when he/she is ill, or becoming ill, but his/her general state over the last 6 months." Thus, we sought to test its utility, and a number of its properties, in a naturalistic setting without raters being trained or briefed (and so not artificially inflating the intrinsic reliability of the measure).

Finally, specific data were sought for both the subjects (e.g., age, sex, type of accommodation, and number of changes in accommodation in the preceding year) and the raters (e.g., period over which rater had known subject and degree of contact in preceding 6 months).

Results

Subjects and Raters. We received 252 completed forms rating 128 individuals with schizophrenia, with 39 being rated once, 58 by two raters, 27 by three raters, and 4 by

four raters. Eighty-nine percent of the subjects were rated over one defined period, with the remainder having subsequent ratings occurring some time after the initial rating. The raters comprised 22 mothers, 10 fathers, 19 other family members, 175 psychiatric professionals (e.g., nurses, psychologists, and social workers), and 20 boarding house managers or personnel. The mean age of the patient group was 36.3 (SD 13.1, range 19–78) years, with 65 percent being male and 35 percent female.

Item Analyses. To determine if any items should be removed from the set, we first inspected the distribution of responses to each item to ensure adequate distribution and variance. Next, we deleted 13 items with low interrater reliability as estimated by the Kappa coefficient. All five items assessing "thinking and memory" were deleted, and we presume their low reliability reflected difficulties in informal assessment of cognitive function. Work items were deleted, as were three "independent living skills" items, the former because few subjects were currently employed. The latter, by comparison, were probably deleted because those items had the key word "can" as against "does," so that raters may have interpreted the item as a request to assess potential as against actual functioning, creating more subjective and less reliable responses.

Refinement of Dimensions and Generation of Scales. We then undertook principal components analyses to determine underlying dimensions and to generate scales. Missing data were replaced by mean values and subsets of the initial components obliquely rotated.

Since there could be up to four raters for each individual, the correlation matrices could be formed in more than one way, which would combine different sources of covariation and so possibly produce different solutions. We compared solutions from three different matrices: the first was based on all the forms ($n = 252$); the second on the average across all raters for each individual ($n = 128$); and the third by selecting a single form from either any health professional chiefly responsible for the person (48 percent), a family member (10 percent), boarding house staff (9 percent), or health personnel (32 percent). The three matrices produced quite similar though not identical solutions, and we therefore continued to use the matrix based on all forms. There were 8 to 10 components with an eigenvalue greater than one, accounting for about 60–70 percent of the variance of the standardized items. The distribution of the eigenvalues suggested that three to five components should be retained and rotated. Such factor limitations were imposed, with the item loadings from a five-component solution providing subsets of items that appeared the most clinically meaningful. The variances accounted for by the first five factors were 26.0 percent, 10.4 percent, 6.0 percent, 4.6 percent, and 3.7 percent, respectively. On several occasions, items that loaded highly on more than one component were shifted to scales with fewer items. A total of 39 items were kept and divided into scales of 10, 12, 6, 6, and 5 items, respectively.

Description and Internal Consistency of Scales. Table 1 indicates the items contributing to the final

scales and to the total measure, with scale labels weighted to adequate function, as against disability, and called: "self-care," "nonturbulence," "social contact," "communication," and "responsibility." Table 2 reports the correlation matrices for both factor and scale scores. For factor scores, there is relative independence, with only "self-care" and "social contact" showing a weak positive association. For scale scores, which necessarily each contain a reduced number of items, each scale is moderately and positively associated with each other, and with total scores being contributed to most strongly by "self-care," "nonturbulence," and "responsibility" scale scores. The internal consistency of each scale was high—(Cronbach's α) 0.88, 0.85, 0.79, 0.67, and 0.77, respectively.

Influences on Scale Scores. Table 3 provides mean data from our sample. The standard deviations, particularly for the total score, suggest that the measure generates an adequate spread of scores in a clinical sample. Because of the large number of significance tests carried out, the overall Type I error rate is likely to be greater than 0.05. While we report probabilities less than 0.05 as significant, the 0.01 level is probably a better compromise between Type I and Type II errors in judging our findings. No sex differences were established for scale or measure scores. Linear trend age effects were established for two scales with older subjects scoring higher on "nonturbulence" ($F = 23.4$, $p < 0.001$; and $r = 0.31$, $p < 0.001$) and "responsibility" ($F = 20.1$, $p < 0.001$; and $r = 0.26$, $p < 0.001$), as well as quadratic trends for three of the scales ("self-care,"

Table 1. Items contributing to final scales, their factor loadings, and the extent to which behaviors were judged as hard to take

Abbreviated item	Self-care	Nontur-bulence	Social contact	Communica-tion	Respon-sibility	Hard to take % Affirm-ing	Hard to take Rank order
Poor cleanliness of clothes	0.85					35	11
Poorly groomed	0.81					23	32
Offensive smell	0.78					52	1
Fails to wash	0.73					46	3
Neglect of physical problems	0.57					34	15
Unsociable habits	0.56					34	14
Poor diet	0.50					31	18
Incapable of budgeting	0.39					34	13
Incapable of food prepara-tion	0.36					27	26
Incapable of work	0.27					20	35
Irresponsible behavior		0.67				41	5
Offensive behavior		0.67				41	4
Violence to others		0.66				52	2
In trouble with police		0.65				25	29
Reckless behavior		0.60				30	19
Abuse of alcohol/drugs		0.59				40	8
Intrusive toward others		0.57				34	12
Problems with other house-hold members		0.57				37	10
Angry to others		0.52				26	28
Destroys property		0.49				39	9
Takes offense readily		0.48				31	17
Violent to self		0.44				28	21
Withdraws from social con-tact			0.78			19	36
No definite interests			0.74			27	25
Generally inactive			0.69			33	16
No social organization involvement			0.68			23	31
No friendships			0.55			27	24
No warmth to others			0.53			9	38
Speech disordered				0.67		23	33
Odd ideas in talk				0.60		28	22
Intrusive in conversation				0.55		28	20
Bizarre or inappropriate ges-tures				0.52		28	23
Difficulty with conversation				0.38		27	27
Reduced eye contact				0.25		9	39
Poor compliance with medi-cation					0.67	24	30

Table 1. Items contributing to final scales, their factor loadings, and the extent to which behaviors were judged as hard to take—Continued

						Hard to take	
Abbreviated item	Self-care	Nontur-bulence	Social contact	Communica-tion	Respon-sibility	% Affirm-ing	Rank order
Uncooperative with health workers					0.53	15	37
Unreliable with own medica-tion					0.51	40	6
Takes others' possessions					0.28	40	7
Loses personal property					0.22	20	34

"social contact," and "communication"), with older subjects tending to break any linear trend for disability to decrease with age. For total measure scores, there was both a linear trend ($F = 6.53$; $p < 0.05$) for older subjects to return higher scores and a quadratic trend due to the "55 years and older" group ($F = 7.1$, $p < 0.01$) breaking the trend, with a group of older subjects having higher levels of disability. Across all scales, there was a consistent trend for subjects who had not changed their accommodations in the previous year to show higher scores, while fewer changes in accommodations were particularly associated with higher "nonturbulence" ($r = -0.35$, $p < 0.001$) and "responsibility" ($r = -0.30$, $p < 0.001$) scores.

Table 3 also reports scale scores against current accommodation type. We examined for differences between particular groupings of accommodations (excluding "mixed" types of accommodations in recent times) by examining four contrasts for each of the scale scores. For the reasons stated earlier, we limited statistical significance to contrasts with a probability cutoff less than the 0.01 level. The first contrast test compared family home or own home with all other accommodation types, and established significantly higher scores on the "self-care" scale only ($t = 2.8$, $p < 0.01$). The second contrast compared community facilities (group homes, boarding houses, and psy-

chiatric hostels) with psychiatric inpatient units and established no significant differences. The third contrast compared boarding houses (with no psychiatric staff) with psychiatrically staffed community facilities (hostels and group houses) with a significant difference being established only for "social contact" scores where boarding house patients scored higher. The fourth contrast compared group homes (i.e., community shared facilities) with boarding houses and hostels (i.e., accommodations favoring individual living arrangements), and no differences were established.

For each item affirmed by a rater as indicating some difficulty in general functioning (i.e., the patient scored 1–3 on that item), we exam-

Table 2. Correlation matrix for factor (and scale) scores, using data from all forms

	Scale				
Scale	Self-care	Nonturbulence	Social contact	Communica-tion	Responsibility
Nonturbulence	0.26 (0.41)				
Social contact	0.35 (0.48)	0.17 (0.30)			
Communication	0.18 (0.49)	0.25 (0.41)	0.22 (0.46)		
Responsibility	0.05 (0.45)	0.24 (0.65)	0.04 (0.35)	0.07 (0.42)	
Total score	(0.80)	(0.79)	(0.66)	(0.70)	(0.75)

Note.—All scale score correlations (shown in parentheses) are significant at $p < 0.001$.

Table 3. Mean scores derived for the sample, together with effects of sex, age, accommodation, and mobility on scale scores

Variable			Scale					
			Self-care	Nontur-bulence	Social con-tact	Communica-tion	Respon-sibility	Total
Whole group mean (SD)			30.6 (6.3)	39.2 (6.7)	13.9 (3.9)	19.2 (3.3)	15.9 (3.3)	118.8 (17.7)
Males	($n = 162$)		30.5	38.6	14.3	19.4	16.1	118.9
Females	($n = 88$)		30.8	40.2	13.3	18.6	15.7	118.6
		$t =$	0.36	1.82	-1.91	-1.84	-0.82	-0.10
Median			31	40	13	19	16	123
Age								
<25 years	($n = 43$)		30.3	34.8	12.9	17.9	14.1	109.9
25–34	($n = 85$)		30.5	39.3	13.9	19.8	16.1	119.7
35–44	($n = 38$)		30.6	39.1	14.1	19.3	15.5	118.7
45–54	($n = 33$)		32.9	42.1	15.6	20.1	17.3	128.0
≥55	($n = 25$)		27.3	42.0	12.5	18.7	17.3	177.9
Linear trend	$F =$		1.1	23.5[3]	0.2	1.0	20.1[3]	6.5[1]
Quadratic trend	$F =$		5.7[1]	2.2	8.4[2]	6.6[1]	0.6	7.1[2]
Change of accommodation in preceding year								
No change	($n = 84$)		32.1	41.3	14.7	19.3	17.0	124.3
1–2	($n = 95$)		30.0	39.3	13.4	19.2	15.8	117.8
3–4	($n = 45$)		28.9	36.6	13.6	18.9	14.6	112.7
>4	($n = 11$)		29.0	31.2	12.5	19.4	13.8	106.0
Linear trend	$F =$		8.6[2]	28.5[3]	4.6[1]	0.12	22.6[3]	21.8[3]
Current accommodation								
Own house	($n = 50$)		31.1	38.4	14.4	19.1	15.8	118.8
Family house	($n = 64$)		32.5	38.6	13.9	19.2	15.8	119.9
Boarding house	($n = 27$)		29.9	41.2	16.5	20.4	16.8	124.7
Psychiatric hostel	($n = 19$)		26.5	38.8	12.5	18.7	15.5	112.1
Psychiatric inpatient	($n = 33$)		31.6	41.7	13.7	19.4	16.8	123.1
Group home	($n = 25$)		30.2	40.5	14.6	19.4	16.4	121.1
Mixed	($n = 19$)		27.1	34.6	11.5	18.0	13.5	104.6

Note.—The number of subjects rated exceeds the sample size of 128, since many subjects were rated by more than one rater and therefore reflect the total number of ratings.

[1] $p < 0.05$.
[2] $p < 0.01$.
[3] $p < 0.001$.

ined the percentage of raters judging that issue as "hard to take," in essence allowing us to determine a rank order for items in terms of their effect on raters. Table 1 reports the rank order, and it may be observed that the "hardest" behaviors for the raters to accept were the patient's having an offensive smell (inducing a 52 percent affirmation by raters as being "hard to take"), the patient being violent to others (52 percent), and the patient failing to wash without reminder (46 percent).

Additionally, we calculated mean "hardness to take" scores in relation to each scale and established that such scores were not related to any particular scale, but more to the status of the rater. Thus (table 4), parents and siblings were most likely to judge behaviors as "hard to take," residential care workers were most accepting, and other respondents (e.g., community nurses, rehabilitation workers) were intermediate in their responses.

Interrater Reliability. Finally, we examined interrater reliability by comparing scale scores for those subjects who were assessed by more than one rater. Table 5 reports three paired ratings (health professional vs. health professional; health professional vs. boarding house manager; and family member vs. health professional). For these three groups (involving 98 subjects), the mean total measure correlation coefficient was 0.68, suggesting moderately high agreement. The level of agreement for each pairing was rather similar, suggesting no particular rater discipline or background as inferior or superior in use of the measure. Comparison of mean scores suggested one pairing as dissonant, with boarding

house proprietors rating in the direction of lower morbidity compared to health professionals, whereas other pairings suggested similar mean scores for family members and health professionals.

Discussion

We report the initial development of a 39-item measure designed specifically to assess general levels of function and disability in those with schizophrenia. Since the measure was not designed to assess schizophrenic features, per se, it is important to note that very few items (apart perhaps from those contributing to the communication scale) have any distinct specificity to schizophrenia. This objective was achieved by careful selection of items, by clear anchoring of ratings, by empirical testing in a large sample of schizophrenic subjects, and by removal of items that were ambiguous or failed to assess readily observable behaviors. Additionally, we believe that we achieved our objectives to generate items that are jargon-free, to include only items readily assessed by professional and nonprofessional staff, and to derive a measure that may be completed simply and rapidly. By removing at an early stage of the analysis items that had low interrater reliability, we enhanced our likelihood of developing reliable scales.

The principal components analyses suggested five key dimensions, which intuitively and clinically appear highly relevant to those with chronic mental illness. While the items suggest dimensions of self-neglect, turbulence, seclusion, inappropriateness, and irresponsibility, we have labeled the scales with an emphasis on low morbidity in the belief that to focus on strengths as against deficits would

be more helpful to subjects and to raters, particularly family members. The five-factor solution accounted for 51 percent of the variance, a highly acceptable result.

In terms of psychometric properties, adequate variance in scores has been demonstrated and the means for each scale are close to the respective medians, suggesting that the constructed scales do not generate extreme responses (i.e., "ceiling" or "basement" scores). The absence of any significant sex difference is important to highlight, since any sex difference in applied studies might suggest a group difference and/or a bias integral to the measure. In explanation of this last point, depression inventories tend to return higher scores for females, reflecting either a real female excess in depressive symptoms and/or an artifact due to items (e.g., crying) being weighted to female-specific depressive behaviors. The tendency for younger subjects to score lower on the "nonturbulence" and "responsibility" scales (the two scales with the highest interscale correlation coefficients) is hardly surprising when it is clinically accepted that violence, turbulence, and irresponsibility are more likely in younger schizophrenic subjects. Such findings suggest that the measure is sensitive to clinical realities, and so offer support for its content validity.

All scale scores were highest in those who had the fewest changes of accommodation. This finding is again intuitively and clinically understandable in suggesting that low morbidity is associated with stability in living arrangements, and again suggests that the sensitivity of the scale is likely to be sufficient to detect clinically significant differences, and argues for its content validity.

Table 4. Mean proportion of items rated hard to take by scale

Rater	Scale						Minimum number of cases
	Self-care	Nontur-bulence	Social con-tact	Inap-propriate-ness	Respon-sibility	Total scale	
Case manager	0.18	0.30	0.19	0.19	0.20	0.22	55
Parent	0.59	0.57	0.50	0.43	0.41	0.50	22
Sibling	0.56	0.41	0.43	0.44	0.41	0.46	7
Boarding house manager	0.40	0.11	0.06	0.14	0.06	0.14	4
Community nurse	0.25	0.23	0.21	0.22	0.14	0.21	13
Residential care worker	0.02	0.06	0.00	0.00	0.02	0.02	8
Hospital nurse—psychiatric	0.33	0.21	0.20	0.14	0.19	0.21	13
Psychologist/social worker	0.19	0.21	0.16	0.13	0.23	0.19	19
Rehabilitation worker	0.17	0.21	0.16	0.17	0.15	0.17	19
Overall	0.25	0.28	0.22	0.21	0.21	0.25	160

Table 5. Comparison of ratings on subjects rated independently by two raters

	Pair 1 (n = 55)			Pair 2 (n = 31)			Pair 3 (n = 12)		
	Family member	Health professional		Health professional	Health professional		Health professional	Boarding house proprietor	
Self-care	29.8	30.8	t = 0.76 r = 0.68	30.8	30.9	t = 0.13 r = 0.75	26.5	30.0	t = 4.22³ r = 0.88
Nonturbulence	37.2	37.8	t = 0.66 r = 0.57	39.2	40.1	t = 1.06 r = 0.66	38.7	41.4	t = 1.57 r = 0.49
Social contact	13.3	12.9	t = 1.07 r = 0.58	13.8	14.4	t = 0.90 r = 0.62	13.7	16.4	t = 2.92² r = 0.64
Communication	18.0	19.0	t = 1.75 r = 0.40	19.7	19.5	t = 0.39 r = 0.24	18.5	20.1	t = 2.19 r = 0.71
Responsibility	14.3	15.2	t = 2.02¹ r = 0.63	16.0	16.1	t = 0.23 r = 0.66	16.4	16.9	t = 0.86 r = 0.68
Total	112.6	115.2	t = 1.14 r = 0.64	119.5	121.0	t = 0.62 r = 0.68	113.7	124.8	t = 3.25³ r = 0.73

¹p < 0.05.
²p < 0.025.
³p < 0.01.

The validity of the measure might also be supported if we could show the lowest scores in the poorest social circumstances, whether those with the greatest dysfunction "drift down" or have their impairment induced by such circumstances. We found the lowest scores in those with "mixed" accommodations (which we interpret as determined more by a link between low scores and high mobility) and in professionally staffed hostels (presumably where support by psychiatric staff is required). Those in boarding houses and group homes had high scores (compatible with their not requiring in-house professional staff) as did psychiatric inpatients. The last finding is superficially paradoxical but could well reflect a reality that dysfunction and disability are less likely to emerge or are less severe when staff and others provide a very supportive environment. If this interpretation is correct, it might be expected that inpatients moved to a more independent facility (in hospital or in the community) would show a decrease (worsening) in scores as their actual limitations in handling living skills became evident. This is not necessarily a weakness of the measure, but an important artifact to be considered in studies comparing environments that differ distinctly in levels of support. Our analyses assessing effects of accommodation type were completed, however, by raters from different disciplines and backgrounds. Since we established (table 4) that family members (for instance) found scale behaviors "harder to take" than professionals, the possibility remains that differences in function and related issues may be determined to some degree by the background of the rater. This issue should be pursued in further exam-

inations of the measure's properties.

We are not confident that our "hardness to take" questions assessed the burden of care in the most efficient way. Effects on the caregiver are clearly important when community tenure, hospital admission, and the course of illness may be influenced as much by the caregiver as by characteristics of the disorder or levels of the disability. Our strategy of assessing burden of care was relatively crude in using a standard question for those from quite different orientations to the patient (e.g., community nurse, family member), and it is unlikely that "hardness to take" would be similarly judged by raters from different disciplines, let alone from different backgrounds or having differing personalities. At this stage we would suggest that, if required, "burden of care" should be judged by some more comprehensive assessment to complement our measure. Nevertheless, our study does provide interesting information on those behaviors that carers find most or least hard to take.

If the measure is a valid one, it should have high reliability, both over time (assuming constancy of function and disability) and between raters. We examined the latter in the present study, believing that development of the measure should not proceed unless satisfactory interreliability was demonstrated, an objective achieved without any imposition or restriction on who might rate or those who might be rated. Formal validity studies will now proceed, encouraged by our noting that the measure is sensitive to socio-demographic (e.g., age, accommodation type) factors in ways that marry with clinical experience. We judge then that the measure is

likely to be of considerable utility for those wishing to assess general function and disability in schizophrenic subjects, both in research studies and in clinical service delivery in profiling and comparing patient groups.

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