

# A Community Ability Scale for Chronically Mentally Ill Consumers: Part I. Reliability and Validity

*Sela Barker, M.S.W., L.C.S.W.*

*Nancy Barron, Ph.D.*

*Bentson H. McFarland, M.D., Ph.D.*

*Douglas A. Bigelow, Ph.D.*

**ABSTRACT:** The authors describe the development, reliability testing, and validation of a 17-item instrument that measures the level of functioning of chronically mentally ill persons living in the community. The Multnomah Community Ability Scale is designed to be completed by case managers. The instrument provides a measure of the consumer's severity of disability which can, in turn, be used to: (a) describe an agency's "case mix" of clients; (b) measure consumer progress; (c) assign clients to different levels of service; and (d) assist payors in determining reimbursement. The Multnomah Community Ability Scale is aimed specifically at persons with chronic mental illness, is sensitive to differences among individuals within this special population, and is quick and easy to complete. The scale's reliability and validity have been examined in detail. Inter-rater and test-retest reliability are good. Criterion variables such as length of psychiatric hospitalization and clinicians' global ratings correlated highly with scale scores. Finally, the instrument predicts subsequent state and local hospital admissions.

---

Sela Barker is Training Coordinator and Quality Assurance Manager, Network Behavioral Healthcare, Inc., 5415 S.E. Milwaukee Ave., Portland, Oregon 97202. Nancy Barron is Program Evaluation Specialist, Multnomah County Community and Family Services Division, Portland, Oregon. Bentson H. McFarland is Associate Professor of Psychiatry, Oregon Health Sciences University, Portland, Oregon. Douglas A. Bigelow is Director of Program Standards and Information Management, British Columbia Ministry of Health, Victoria, British Columbia.

Supported in part by National Institute of Mental Health grants numbers P50 MH 43458 and R01 MH 44686. The authors gratefully acknowledge Mary Packard (Delauney Mental Health Center); Margie McCloud, LCSW (Mental Health Services West); and Debbie Young, PMHNP (Mt. Hood Community Mental Health Center) for their contributions to the initial development and subsequent revisions of the Multnomah Community Ability Scale.

Presented in part at the annual meeting of the International Association for Psychosocial Rehabilitation Services, Cleveland, Ohio, June 12, 1986 and at the annual meeting of the American Public Health Association, Atlanta, Georgia, November 13, 1991.

## INTRODUCTION

Instruments that quantify the severity of disability due to mental illness are useful in several contexts (Goodman et al., 1993; Green and Gracely, 1987; Horn et al, 1989; Kuhlman et al, 1990). For example, measures of this type can be employed to evaluate outcomes of mental health services (Bachrach, 1987; Berren, 1984; Diamond and Biegel, 1984; Green and Gracely, 1987); to predict psychiatric hospital length of stay (Freiman, 1990; Horn et al, 1989); or to plan service delivery (Drummond, 1987; Kuhlman et al, 1990; Sisk, 1987). Other uses include determining the level of care clients need (Furman and Schneider, 1980; Kramer et al, 1990).

As it happens, many existing scales are aimed at a diverse population of persons with assorted mental disorders (see, e.g. Green and Gracely, 1987 or Cook, 1992 for reviews). There are relatively few instruments targeted specifically at individuals with chronic mental illnesses such as schizophrenia. Instruments such as the Brief Psychiatric Rating Scale (Lulroff, Nuechterlein and Ventura, 1986; Overall and Gorham, 1962) or the Nurses' Observation Scale for Inpatient Evaluation (Honigfeld, Gillis and Klett, 1966) were designed to evaluate psychiatric symptomatology in a highly controlled environment such as a hospital ward. These scales have less relevance to the diverse community environments in which clients may live.

Other scales used with chronically mentally ill consumers (reviewed in Green and Gracely, 1987) call for a global assessment of functioning (Dworkin et al, 1990; Kuhlman et al, 1990). Although a global assessment is undoubtedly worthwhile (Green and Gracely, 1987), clinicians often need more detailed information. Brekke (1992) points out that outcomes for consumers with schizophrenia need to be assessed multidimensionally.

While the Uniform Client Data Instrument (Bean et al, 1988; Mulhern and Manderscheid, 1989) and the Colorado Client Assessment Record (Ellis et al, 1984) overcome some of these objections, neither necessarily satisfies the data needs of community mental health program managers (Lemoine and Carney, 1984; McPheeters, 1984; Owen, 1984; Wood and Beardmore, 1984). For example, community mental health program staff are sometimes intimidated by the multi-page format of the Uniform Client Data Instrument. The Colorado Client Assessment Record (CCAR) is a one-page instrument. However, the CCAR calls for "yes/no" responses to several critical questions (e.g., "budget" and "finance") pertaining to persons with chronic mental illness. Agency personnel are often interested in a more quantitative

description of clients' strengths and weaknesses. Community mental health program staff are at times unsure about the reference population for the CCAR's level of functioning scales.

Recently, Hoyle et al (1992) have described an instrument (the Disability Rating Form) designed to be used with chronically mentally ill persons. The Disability Rating Form conforms to the Social Security Administration's guidelines for determining disability by measuring consumer capabilities in several broad areas: activities of daily living, social functioning, concentration and task performance, and adaptation to change. However, the instrument does not yield information about consumer functioning in specific areas such as money management or medication compliance which are of substantial interest to treatment providers.

Another new instrument is the Life Skills Profile (Rosen et al, 1989). This 39 item questionnaire is designed to measure function and disability among persons with schizophrenia. The profile is to be completed by health professionals and/or family members. Early reports suggest that the instrument is reliable and has content validity. To our knowledge the Life Skills Profile has not been used extensively outside of Australia (Rosen et al, 1989).

Accordingly, we collaborated with community mental health program line staff to develop a multi-item instrument aimed specifically at persons with chronic mental illness living in the community (Bachrach, 1987). The goal was to provide clinicians and managers with a measurement tool that would be sensitive to the variation in levels of severity within a population of consumers who, by definition, are seriously disabled. The instrument was designed to fit on a single sheet of paper and to be easily completed by case managers familiar with the consumers. The scale was also designed in such a way that it did not require knowledge about the consumer's use of inpatient or outpatient mental health services. Our intention was that the instrument would serve as a program evaluation tool, measure consumer change over time, assist with client assessment or case review, help in resource allocation, and aid in workload distribution among staff.

## METHODS

### *The Service Environment*

The Multnomah Community Ability Scale (MCAS) was developed in Multnomah County, Oregon, which contains the city of Portland, surrounding towns, and a rural area encompassing the Columbia Gorge. There are 583,887 residents of the county according to the 1990 census. Based on the Colorado method of indirect needs assessment for purposes of mental health service system planning, an estimated 12,732

persons in Multnomah County are diagnosable with schizophrenia, bipolar disorder, major depressive disorder, or cognitive impairment (Ciarlo, 1992). The public mental health system serves some four thousand clients or about a third of those who may be in need.

Multnomah County Community and Family Services Division contracts with seven non-profit community mental health agencies for the delivery of community support and crisis services to chronically mentally ill persons. At the time the scale was developed, services were delivered by community mental health agencies in four geographic catchment areas or quadrants. When a consumer moved from one quadrant to another, the person was transferred to the agency in the new locale. To receive community support services, a consumer had to be an adult of age 18 or above, have a diagnosis of a major mental illness (i.e., schizophrenia or bipolar disorder), be at risk of hospitalization, and suffer from social role impairment in several areas. Subsequently these arrangements have been modified to allow county-wide access to some services but also to hold the agencies responsible (by contract) for consumers' use of the state hospital irrespective of the clients' characteristics.

### *Background*

The Multnomah Community Ability Scale was developed by a group of mental health professionals from four community mental health agencies and the county mental health authority. The group's mission was to create a common, objective measure of the disability of chronic mental illness for persons in the community.

At the time the scale was developed, the agencies were providing two levels of service related to level of consumer ability as defined by a state funding program for intensive case management. The Oregon state mental health authority, county mental health program, and the community mental health agencies were interested in relating needed service intensity to measured level of consumer functioning. It was hypothesized that assigning consumers to differentiated levels of service based on level of functioning and (therefore) need would result in more effective use of resources. Case managers quickly discovered that hospital usage *alone* was not a good indicator of consumer ability or need for services. Some consumers found to be more disabled were assigned (solely on the basis of hospitalization) to regular case management teams while less disabled clients were assigned to the intensive case management team. The resulting difficulty in workload assignment and responsiveness to consumer needs was a major impetus to develop an instrument. Another purpose for the scale was to act as a common screening tool when transferring clients between the geographically dispersed agencies.

Several requirements guided the development of the scale (Bean et al, 1988; Kramer et al, 1990; Spitzer, 1987). It had to capture representative and valid indicators of the disability of chronic mental illness (Carmines and Zeller, 1979; Lord and Novick, 1968; Nunnally, 1978; Ware, 1987; Weltzien et al, 1986). It had to be reliable (Dworkin et al, 1990; Stahler and Rappaport, 1986). It had to be accepted by clinicians and be quick to complete.

### *Identifying the Indicators*

The process of developing the instrument began with a Q-Sort using a list of the salient indicators of the disability associated with chronic mental illness (Nunnally, 1978). Thirty-six indicators on a set of index cards were rated by 47 clinicians in the four agencies. Each index card was printed with a range of four responses. Clinicians prioritized the indicators as to their importance in assessing level of ability.

We calculated a ranking for each indicator and plotted the distribution of rankings. We noted patterns of those rankings and tabulated the highest ranked ones into a semi-final set of indicators. Some of the indicators were consolidated because of redundancy. Other indicators were excluded because they were level of service variables.

We found a relationship between the rater's role in service delivery and his or her preference for an indicator. For example, case managers rated "cooperation with treatment providers" highly while day treatment staff favored "social skills." We arrived at a set of 13 items and formulated the first scale.

### *Piloting the Initial Instrument*

To the 13 highest ranking items from the Q-Sort we added other criterion variables (e.g. number of hospitalizations) in a separate section to check validity. Three clinician's global rating scales were also added. One was a 10-point scale asking the clinician to rate the consumer's overall ability (1 = not disabled, 10 = most disabled). Another was a six point risk of hospitalization scale (1 = not at risk, 6 = highest risk). The final global scale was a rating of consumer stability (1 = stable, 2 = stable with moderate support, 3 = stable with intensive support, 4 = unstable despite intensive support). The initial instrument was designed to be filled out by the case manager.

The instrument was then completed for a 10% random sample of consumers from each agency (N = 180). Sample consumers were at different points in their course of treatment and all met the criteria for receiving community support services.

### *Piloting the Revised Scale*

Based on the initial pilot test, the instrument was revised and expanded from 13 to 17 items. Some of the initial items were discarded because of vagueness while others were discarded because they were really level of service measures rather than level of functioning scores. Several social competence items were added.

The 17 items were grouped into four subsections. The revised items fell into four conceptually different categories: (1) interference with functioning, (2) adjustment to living, (3) social competence, and (4) behavior problems. These four categories were then defined as subscales in order to give summary information to clinicians. In addition, response sets were standardized to frequency scoring with five possible answers (plus "don't know").

The revised instrument was pilot tested again, using methodology similar to the first pilot. A 10% random sample of consumers from four agencies was taken (N = 150). The scale was again completed by case managers. They also recorded "criterion" variables such as age, sex, number of hospitalizations and the global ratings.

### *Reliability*

An inter-rater and test-retest reliability study was then conducted. Two community mental health agencies were asked to select approximately twenty-five consumers each. Two clinicians (each of whom knew the consumer) rated the consumers independently and were then asked to repeat the ratings after two to four weeks. Other than a written set of instructions, there was no training on how to use the scale prior to its administration. Ratings for each scale item were correlated between raters and between testing periods using intra-class correlation coefficients (Bartko, 1991; Fleiss, 1981; Snedecor and Cochran, 1980). Since the test-retest data had multiple raters for some consumers a hierarchical analysis of variance design was used in which raters

were nested within consumers and dates-of-rating were nested within raters (Snedecor and Cochran, 1980).

### *Validity*

Participants in the reliability study were also asked to choose a global rating for their client *before* they filled out the scale: Stable (with regular community support services), Moderately Stable (with regular community support services), Moderately (stable with) Intensive (community support services), and (unstable despite) Intensive (community support services). These ratings were descriptors of consumer functioning being used informally in some of the agencies at the time. These global clinician ratings were compared to total MCAS scores.

Finally, MCAS scores were obtained on 240 clients of a local community mental health agency's community support program over a four month period in late 1989 and early 1990. The consumers were 39% male, had an average age of 43.5, were 94% European-American, and were severely mentally ill with the principle diagnoses being schizophrenia (63%) and bipolar disorder (17%). These consumers were then followed to determine their subsequent utilization of local hospital involuntary treatment programs and their admissions to the state hospital. The follow-up period for local hospital admissions was 18 months and the follow-up time for the state hospital was two years.

## *RESULTS*

### *Outcomes of the Pilot Testing*

The results of piloting the initial instrument showed that many consumers were rated as less disabled on several of the original items. Other items appeared to have a symmetric distribution of scores. Fewer items had scores concentrated on the highly disabled end of the scale. In other words, some items appeared to differentiate among consumers and perhaps, therefore, show underlying sensitivity to levels of ability. We found no relationship between sex and the initial items. Age correlated negatively with five of the 13 original items (number of crises, suicidal ideation, violent threats, and substance abuse) and positively with health. In general, there were high correlations between the demographic and service utilization variables and scale items. The current level of case management the consumer was receiving also correlated with the overall score on the initial instrument. Eight of the 13 initial items correlated with hospital use. Eleven of the 13 initial items correlated with the initial clinicians' global ratings.

Analysis of the revised instrument's pilot test showed several items that had symmetric distributions and a few items that were still skewed toward lower disability (i.e., consumers were rated at the higher end of the scale). Some of the skewed variables were found to be

problematic. For instance, the frequency of suicide attempts was so low as to be of limited utility. Such indicators were again discarded. All five levels of rating were not always used. In one item—social effectiveness—clinicians used the three center points (two, three and four) and avoided one and five. The final form of the instrument is given in the Appendix.

### *Reliability*

The agencies who participated in the reliability testing returned questionnaires on 43 clients. There were paired ratings by two different raters (on the same date) for all 43 consumers. There were repeated ratings (after two to four weeks and by the same rater) for 40 consumers. On average there were 1.525 pairs of test-retest ratings for each of those 40 consumers. Clinicians who participated in the reliability testing almost always answered each item on the scale. In fact, there were only 15 “don’t know” responses out of 2550 items to be answered. For those rare instances where the scale was incomplete, prorating was used to complete the sub-scale and total scores as described in the user’s manual (Barker et al, 1993). Prorating was required in only four percent of cases.

### *Inter-Rater Reliability*

Table 1 shows the inter-rater reliability data for the final, 17-item instrument. The reliability of the total score between raters was .85. Items with a reliability (intra-class correlation coefficient) of .6 or greater were: intellectual functioning, thought processes, independence in daily life, acceptance of illness, social acceptability, social effectiveness, cooperation with treatment providers, alcohol or drug abuse, the four subscales, and the total score. Several items had an intra-class correlation between .50 and .59 including: mood abnormality, response to stress & anxiety, ability to manage money, and social interest. Items with less than a .5 intra-class correlation were physical health, social network, social participation, medication compliance, and impulse control.

A more in-depth analysis was completed of the items that correlated .5 or below. Two items, physical health and impulse control, were rated differently by the two agencies. It was later discovered that two pairs of clinicians at one agency had inverted the item scores for physical health which invalidated those results. Conversely, the other agency had high inter-rater reliability for the physical health item.

**TABLE 1**  
**Reliability Measures**  
**(Intra-class Correlation Coefficients)**

| <i>Item</i>                                | <i>Inter-rater</i> | <i>Test-retest</i> |
|--|--------------------|--------------------|
| 1. Physical Health                         | .32                | .31                |
| 2. Intellectual Functioning                | .72                | .64                |
| 3. Thought Processes                       | .60                | .70                |
| 4. Mood Abnormality                        | .52                | .57                |
| 5. Response to Stress & Anxiety            | .52                | .67                |
| 6. Ability to Manage Money                 | .57                | .83                |
| 7. Independence in Daily Life              | .68                | .63                |
| 8. Acceptance of Illness                   | .62                | .70                |
| 9. Social Acceptability                    | .73                | .84                |
| 10. Social Interest                        | .56                | .32                |
| 11. Social Effectiveness                   | .70                | .75                |
| 12. Social Network                         | .35                | .53                |
| 13. Meaningful Activity                    | .34                | .41                |
| 14. Medication Compliance                  | .48                | .52                |
| 15. Cooperation with Treatment             | .68                | .52                |
| 16. Alcohol/Drug Abuse                     | .75                | .90                |
| 17. Impulse Control                        | .42                | .59                |
| Sub-scale 1. Interference with functioning | .70                | .77                |
| Sub-scale 2. Adjustment to living          | .75                | .82                |
| Sub-scale 3. Social competence             | .75                | .71                |
| Sub-scale 4. Behavioral problems           | .78                | .70                |
| Total Score                                | .85                | .83                |

For impulse control, one agency had a very low correlation while the other had a very high one with no apparent explanation. While raters might have differed on any one item, they did not differ significantly on the total score. Pairs of raters were often just one scale point off from each other. With other items, we examined the wording of the question and the scale values. We discovered that on the social effectiveness item, raters tended to use the middle three scale values (which might be appropriate for a question attempting to tap behavior that is difficult to observe).

We considered eliminating three of the items in the social competence section because those correlations tended to be low (except for social



acceptability and social effectiveness). We retained them because we felt that the whole area of social competency was very important in giving a complete picture of client ability. In addition, one of the agencies had higher correlations between raters on some of the social competence items than did the other agency (indicating there might have been an error in the initial completion of the scale).

Medication compliance was less reliable than expected. We have no explanation for this finding.

### *Test-retest Reliability*

Table 1 also shows the test-retest data. One agency retested after a two week period and the other retested after a one month period. Stability over time was good. The total score intra-class correlation was .827. Items with a correlation of .7 or greater were: thought processes, ability to manage money, acceptance of illness, social acceptability, social effectiveness, alcohol/drug abuse, the four sub-scales, and the total score. Items with a reliability between .60 and .69 were: intellectual functioning, response to stress & anxiety, and independence in daily life. Items with less than a .6 test-retest reliability intra-class correlation coefficient were: mood abnormality, social interest, social network, social participation, medication compliance, cooperation with treatment providers, and impulse control. One agency had a low correlation while the other had a high correlation on social interest and medication compliance.

For many items, raters were consistent in their assessment of consumers. In other words, test-retest reliability was similar in magnitude to inter-rater reliability. One of the reasons for this result might be a difference in clinical judgment between raters. This conjecture was later born out when we trained clinicians to use the scale. Scale protocols showed that some clinicians had very different clinical judgments about consumer functioning, which included some value judgments—an external variable difficult to control. Also, we found for social effectiveness there was decreased variance in use of the scale responses. Raters need training in distinguishing the extremes of social functioning. For the variables physical health and impulse control, there was inconsistency between the two agencies. The variables for which there was little reliability in either test were: social network, social participation, and medication compliance.

As a measure of internal consistency we also computed Cronbach's alpha coefficient (Lord and Novick, 1968) which was 0.90. Therefore, the scale shows good internal consistency.

TABLE 2  
Correlations with Demographic and Service Variables

|                                 | Age                | # Local Hosp.      | # Days Local       | # State Hosp.      | # Days State       | # Total Hosp.      | # Total Days        |
|---------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|---------------------|
| 1. Physical Health              | -.29<br>(P < .001) | -.23<br>(P < .01)  | -.29<br>(P < .001) | +.05<br>(P = NS)   | -.05<br>(P = NS)   | -.16<br>(P = NS)   | -.13<br>(P = NS)    |
| 2. Intellectual Functioning     | +.05<br>(P = NS)   | +.05<br>(P = NS)   | +.05<br>(P = NS)   | +.05<br>(P = NS)   | -.11<br>(P = NS)   | +.03<br>(P = NS)   | -.09<br>(P = NS)    |
| 3. Thought Processes            | +.06<br>(P = NS)   | -.20<br>(P < .05)  | -.25<br>(P < .01)  | -.30<br>(P < .001) | -.40<br>(P < .001) | -.27<br>(P < .001) | -.46<br>(P < .0001) |
| 4. Mood Abnormality             | +.01<br>(P = NS)   | -.29<br>(P < .001) | -.29<br>(P < .001) | -.24<br>(P < .01)  | -.21<br>(P < .01)  | -.32<br>(P < .001) | -.28<br>(P < .001)  |
| 5. Response to Stress & Anxiety | +.04<br>(P = NS)   | -.26<br>(P < .01)  | -.27<br>(P < .01)  | -.24<br>(P < .01)  | -.25<br>(P < .01)  | -.29<br>(P < .001) | -.33<br>(P < .001)  |
| 6. Ability to Manage Money      | +.13<br>(P = NS)   | -.13<br>(P = NS)   | -.14<br>(P = NS)   | -.35<br>(P < .001) | -.39<br>(P < .001) | -.23<br>(P < .01)  | -.41<br>(P < .0001) |
| 7. Independence/Daily Life      | +.04<br>(P = NS)   | -.09<br>(P = NS)   | -.11<br>(P = NS)   | -.18<br>(P < .05)  | -.30<br>(P < .001) | -.14<br>(P = NS)   | -.32<br>(P < .0001) |
| 8. Acceptance Illness           | +.19<br>(P < .05)  | +.10<br>(P = NS)   | +.02<br>(P = NS)   | -.13<br>(P = NS)   | -.29<br>(P < .001) | -.03<br>(P = NS)   | -.26<br>(P < .01)   |
| 9. Social Acceptability         | +.06<br>(P = NS)   | -.12<br>(P = NS)   | -.12<br>(P = NS)   | -.23<br>(P < .01)  | -.22<br>(P < .01)  | -.18<br>(P < .05)  | -.24<br>(P < .01)   |
| 10. Social Interest             | -.01<br>(P = NS)   | +.03<br>(P = NS)   | -.05<br>(P = NS)   | -.03<br>(P = NS)   | -.11<br>(P = NS)   | +.01<br>(P = NS)   | -.12<br>(P = NS)    |

|                           |                   |                 |                  |                   |                   |                   |
|---------------------------|-------------------|-----------------|------------------|-------------------|-------------------|-------------------|
| 11. Social Effectiveness  | + .11<br>(P=NS)   | + .02<br>(P=NS) | -.14<br>(P=NS)   | -.22<br>(P<.01)   | -.02<br>(P=NS)    | -.20<br>(P<.05)   |
| 12. Social Network        | -.09<br>(P=NS)    | -.19<br>(P<.05) | -.10<br>(P=NS)   | -.22<br>(P<.01)   | -.08<br>(P=NS)    | -.26<br>(P<.01)   |
| 13. Meaningful Activity   | -.09<br>(P=NS)    | -.13<br>(P=NS)  | -.27<br>(P<.01)  | -.23<br>(P<.01)   | -.18<br>(P<.04)   | -.25<br>(P<.01)   |
| 14. Medication Compliance | + .15<br>(P=NS)   | -.28<br>(P<.01) | -.30<br>(P<.001) | -.13<br>(P=NS)    | + .28<br>(P<.01)  | -.20<br>(P<.05)   |
| 15. Cooperation Treatment | + .25<br>(P<.01)  | -.19<br>(P<.03) | -.29<br>(P<.001) | -.19<br>(P<.05)   | -.25<br>(P<.01)   | -.24<br>(P<.01)   |
| 16. Alcohol/Drug Abuse    | + .25<br>(P<.01)  | -.06<br>(P=NS)  | -.14<br>(P=NS)   | -.19<br>(P<.04)   | -.08<br>(P=NS)    | -.20<br>(P<.05)   |
| 17. Impulse Control       | + .29<br>(P<.001) | -.24<br>(P<.01) | -.43<br>(P<.001) | -.38<br>(P<.001)  | -.38<br>(P<.0001) | -.43<br>(P<.0001) |
| Total Scale Score         | + .18<br>(P=NS)   | -.26<br>(P<.01) | -.31<br>(P<.002) | -.36<br>(P<.0002) | -.28<br>(P<.01)   | -.43<br>(P<.0001) |

### *Validity*

We had 94 categorical global ratings (as well as MCAS scores) on 33 consumers who had been involved in the reliability testing. Using the global rating as a co-variate in a one-way analysis of variance we found a correlation of  $-0.78$  between the global rating and the total MCAS score ( $p$  less than  $.0001$ ).

We then compared the 17 items and the "criterion" variables to check validity (see Table 2). Correlations with age seemed to verify clinical knowledge, e.g., younger consumers were rated lowest (worst) on "behavioral problem" items and older clients rated lowest (worst) on physical health. All items correlated with criterion variables such as hospitalization, except social interest and intellectual functioning. There were also high correlations between the ten-point clinician global rating and all the items (data not shown), which further confirmed the validity of the scale.

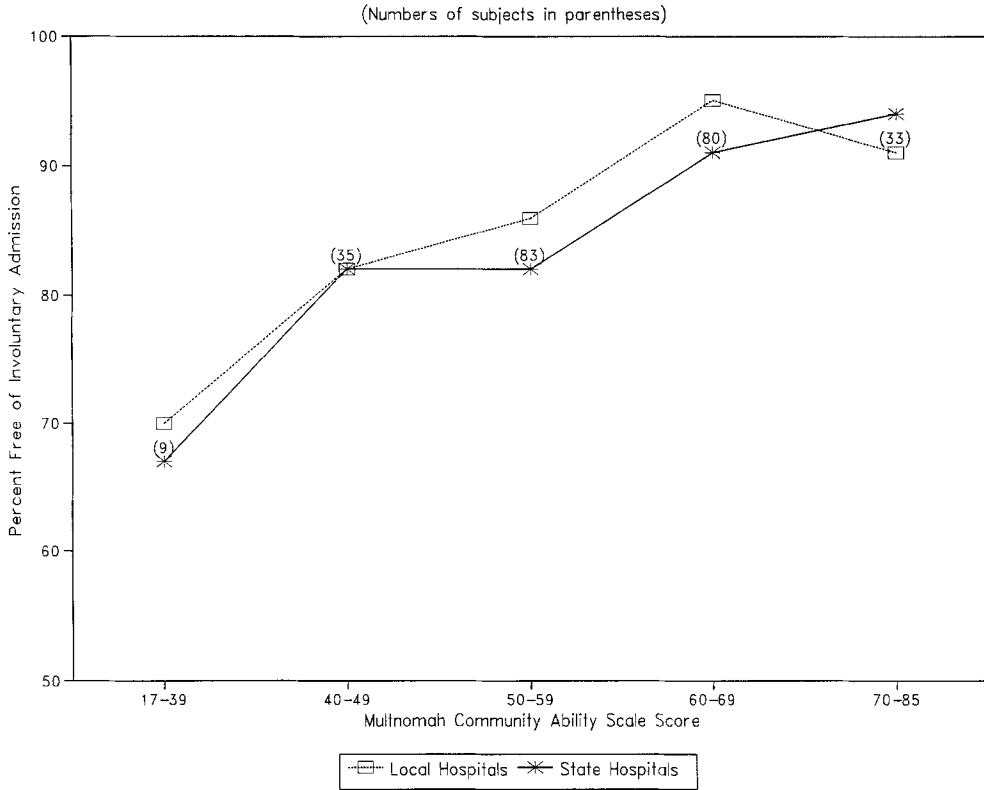
Although the final scale items were deliberately selected to be completed independently of the clients' current outpatient community mental health service utilization, in fact, these items are highly correlated with measures of resource consumption. As noted, Table 2 shows the correlation between the individual items in the scale and several measures of state and local hospital utilization. Here we see that most of the items are correlated with hospital usage. As one would expect, the correlation is such that the more disabled individuals utilized more inpatient mental health services.

Factor analysis of data from the 240 community support program clients showed that the scale's 17 items formed four factors which corresponded with the four sub-scales.

### *Predicting Subsequent Hospitalizations*

Figure 1 shows the subsequent utilization of local and state hospitals by the 240 community support program clients as a function of MCAS score. Persons with higher MCAS scores were less likely to make use of the state hospital (during the two year follow-up period) or to be admitted involuntarily to a local hospital (within the 18 month follow-up period) than were persons with lower scores. The figure indicates that the instrument has substantial ( $p$  less than  $.001$ ) prospective predictive validity (chi-squared test for trend greater than  $6.05$  with one degree of freedom,  $p = .01$ ). These findings were confirmed by multivariate logistic regression using age, gender, ethnicity, diagnosis, and MCAS scores as predictors.

**Figure 1**  
**Prediction of Subsequent Hospital Usage**



*DISCUSSION*

A unique quality of the MCAS is the fact that it was developed at the community level by a group of clinicians, managers, and county program staff. The development of the scale reflects both the perspective of individuals working directly with consumers and the perspective of those managing programs for these clients. As discussed earlier, the MCAS was developed to manage mental health resources for clients more efficiently by making it possible to match intensity of services to level of consumer functioning. The other primary use was to gain an

understanding of the total client population in order to plan services more effectively.

In contrast, many scales are developed in academic settings for research purposes (Honigfeld, et al, 1966; Overall and Gorham, 1962). The application to services and consumers is secondary in academic work, where the primary goal is to increase understanding of particular phenomena. The authors recommend our community-based approach to the development of instruments to be applied in community settings. The partnership among administrators, clinicians and researchers insures a higher degree of acceptance by those who will use the product.

Three requirements for measures to be used in clinical practice are: reliability, validity, and practicality (Corcoran and Fischer, 1987). It is important to recognize that a given instrument may have these properties only when it is used with a specific population (Carmines and Zeller, 1979). In addition to inter-rater and test-retest reliability, it is important for measures to have retrospective and concurrent validity (Bean et al, 1988; Carmines and Zeller, 1979; Lord and Novick, 1968; Nunnally, 1978; Ware, 1987; Weltzien et al, 1986).

We feel that the Multnomah Community Ability Scale meets most of the requirements posed for development of this instrument. Specifically, the scale was developed with and is meant to serve the needs of line staff working in community mental health programs that serve chronically mentally ill consumers. The instrument is easy for staff to complete. The instrument also provides useful measures of client ability in several areas.

We have shown that the Multnomah Community Ability Scale is a highly reliable instrument. The total scale as well as the individual items have high levels of inter-rater reliability. In addition, the scale is stable when it is administered twice within a period of a few weeks. Fleiss (1981) characterizes intra-class correlation coefficients greater than .75 as "excellent" agreement while those between .40 and .75 are considered "fair to good". By those definitions the total MCAS score has excellent inter-rater (.85) and test-retest (.83) reliability while the subscales and the individual items are generally in the good range. Also, the instrument shows considerable internal consistency.

It is also of interest to note that the Multnomah Community Ability Scale is highly correlated with measures of state mental hospital utilization. Although the Multnomah Community Ability Scale is designed to be completed without reference to utilization data, in fact the scores

on the instrument are closely related to measures such as days of state and local hospital utilization. Indeed, the instrument is a powerful prospective predictor of local and state hospitalization.

Though titled the Multnomah Community Ability Scale, the scale in fact measures both impairment and ability (Susser, 1990). Since the development of the scale, much has been written about the development and efficacy of psychiatric rehabilitation (Anthony, et al, 1986; Anthony & Liberman, 1986). As the distinctions between treatment (which alleviates impairment) and rehabilitation (which enhances functioning) have become elucidated (Wood, 1980; Frey, 1984), the authors have become aware that sub-sections 1 and 4 focus on impairment (symptoms) while sub-sections 2 and 3 focus on ability (functioning). These sub-sections could be grouped together for a more finely distinguished consumer profile. The authors anticipate that further research analysis would be beneficial in illuminating the distinctions between impairment and functioning (Spitzer, 1987).

Another consideration, as with other scales, is the possible contamination of results when used in a political context of funding levels for client service or workload assignments (Stahler & Rappaport, 1986). In such a situation there should be other checks and balances, for example an active quality assurance program. This issue of contamination, of course, is common to all rating scales and is not unique to the MCAS. An independent rater may be a solution, but this rater must have knowledge of chronically mentally ill persons in the community and of the individual consumer. For example, in rating consumers discharged from a local state hospital, liaison staff who are knowledgeable clinicians familiar with each client might rate the patient first independently, then as a group. Each community mental health program and the central administrative office would be represented. This procedure allows multiple perspectives to be combined and minimizes any agency bias.

In conclusion, we have shown that the Multnomah Community Ability Scale is a highly reliable and valid instrument. Sufficient reliability exists for acceptance of the scale as a valid, useable instrument. This validity is reassuring (Ware, 1987). The scale is therefore meaningful for field applications for chronically mentally ill persons living in the community. Elsewhere we describe applications of this scale in several areas of community mental health (Barker et al., 1994). Also available is a user's manual that gives normative data and a training program for using the instrument (Barker et al., 1993).

## REFERENCES

- Anthony, W.A., Kennard, W.A., O'Brien, W.F., & Forbess, R. (1986). Psychiatric rehabilitation: past myths and current realities. *Community Mental Health Journal*, 22:249-263.
- Anthony, W.A. & Liberman, R.P. (1986). The practice of psychiatric rehabilitation: historical, conceptual and research base. *Schizophrenia Bulletin*, 12:542-559.
- Bachrach, L.L. (1987). Measuring program outcomes in Tucson. *Hospital and Community Psychiatry*, 38:1151-1152.
- Barker, S., Barron, N., McFarland, B.H., Bigelow, D.A., & Carnahan, T. (1994). A community ability scale for chronically mentally ill consumers: part II. applications. *Community Mental Health Journal*, 30:459-472.
- Barker, S., Barron, N., McFarland, B.H., and Bigelow, D.A. (1993). User's manual for the Multnomah Community Ability Scale. Network Behavioral Healthcare, Inc., Portland, Oregon.
- Bartko, J.J. (1991). Measurement and reliability: statistical thinking considerations. *Schizophrenia Bulletin*, 17:483-489.
- Bean, G.J., Champney, T.F., Garrett, J., & Townsend, W. (1988). An assessment of the reliability and validity of the functioning scales used in the 508 certification process. In *New Research in Mental Health (1986-1987)*, Ohio Department of Mental Health Office of Program Evaluation and Research, Columbus. 168-175.
- Berren, M.R. (1984). Statewide outcome evaluation: an introduction to the special issue. *Community Mental Health Journal*, 20:4-13.
- Brekke, J.S. (1992). An examination of the relationships among three outcome scales in schizophrenia. *Journal of Nervous and Mental Disease* 180:162-167.
- Carmines, E.G. & Zeller, R.A. (1979). *Reliability and Validity Assessment*. Sage Publications, Inc., Newbury Park, California.
- Ciarlo, J.A. (1992). Indirect needs assessment for mental health services planning. *Evaluation and Program Planning*, 15 (special issue).
- Cook, J.A. (1992). Outcome assessment in psychiatric rehabilitation services for persons with severe and persistent mental illness. Manuscript. Thresholds National Research and Training Center on Rehabilitation and Mental Illness, Chicago, Illinois.
- Corcoran, K. and Fischer, F. (1987). *Measurements for Clinical Practice*. Free Press, New York.
- Diamond, H. & Biegel, A. (1984). Introduction to the special issue on statewide outcome evaluation. *Community Mental Health Journal*, 20:3.
- Drummond, M.F. (1987). Resource allocation decisions in health care: a role for quality of life assessments? *Journal of Chronic Disease*, 40:605-616.
- Dworkin, R.J., Friedman, L.C., Telschow, R.L., et al (1990). The longitudinal use of the global assessment scale in multiple-rater situations. *Community Mental Health Journal* 26:335-344.
- Ellis, R.H., Wilson, N.Z., & Foster, F.M. (1984). Statewide treatment outcome assessment in Colorado: The Colorado Client Assessment Record (CCAR). *Community Mental Health Journal* 20:72-89.
- Fleiss, J.L. (1981). *Statistical Methods for Rates and Proportions* (second edition). John Wiley and Sons, New York.
- Freiman, M.P. (1990). Hospital financial performance under the prospective payment system by type of admission: psychiatric versus medical/surgical. *Health Services Research* 25:785-808.
- Frey, W.D. (1984). Functional assessment in the 1980's: A conceptual enigma, a technical challenge. In A.S. Halpern & M.J. Fuhrer (Eds.), *Functional Assessment in Rehabilitation*. Paul Brookes, Baltimore. 11-43.
- Furman, W.J. & Schneider, D.P. (1980). A comparison of the level of care predictions of six long-term-care patient assessment systems. *American Journal of Public Health* 70:1152-1161.
- Goodman, S.H., Sewell, D.R., Cooley, E.L. & Leavitt, N. (1993). Assessing levels of adaptive functioning: the role functioning scale. *Community Mental Health Journal* 29:119-131.
- Green, R.S. & Gracely, E.J. (1987). Selecting a rating scale for evaluating services to the chronically mentally ill. *Community Mental Health Journal* 23:91-102.
- Honigfeld, G., Gillis, R.D. & Klett, J.C. (1966). NOSIE-30: A treatment sensitive ward behavior scale. *Psychological Reports* 19:180-182.



- Horn, S.D., Chambers, A.F., Sharkey, P.D. & Horn, R.A. (1989). Psychiatric severity of illness: a case mix study. *Medical Care* 27:69-84.
- Hoyle, R.H., Nietzel, M.T., Guthrie, P.R., Baker-Prewitt, J.L., and Heine, R. (1992). The Disability Rating Form: a brief schedule for rating disability associated with severe mental illness. *Psychosocial Rehabilitation Journal* 16:77-93.
- Kramer, H.B., Massey, O.T. & Pokorny, L.J. (1990). Development and validation of a level-of-care instrument for predicting residential placement. *Hospital and Community Psychiatry* 41:407-412.
- Kuhlman, T.L., Sincaban, V.A. & Bernstein, M.J. (1990). Team use of the global assessment scale for inpatient planning and evaluation. *Hospital and Community Psychiatry* 41:416-419.
- Lemoine, R.L. & Carney, A. (1984). The Louisiana health client-outcome evaluation project: an initial progress report. *Community Mental Health Journal* 20:90-100.
- Lord, F.M. & Novick, M.R. (1968). *Statistical Theories of Mental Test Scores*. Addison-Wesley Publishing Company, Inc., Boston. 88-91, 261-353.
- Luloff, D., Nuechterlein, K.H., & Ventura, J. (1986). Manual for expanded brief psychiatric rating scale (BPRS). *Schizophrenia Bulletin* 12:594-602.
- McPheeters, H.L. (1984). Statewide mental health outcome evaluation: a perspective of two southern states. *Community Mental Health Journal*, 20:44-55.
- Mulkern, V.M. & Manderscheid, R.W. (1989). Characteristics of community support program clients in 1980 and 1984. *Hospital and Community Psychiatry* 40:165-172.
- Nunnally, J.C. (1978). *Psychometric Theory* (Second Edition). McGraw-Hill, New York. 86-97, 214-233.
- Overall, J.E., & Gorham, D.R. (1962). The brief psychiatric rating scale. *Psychological Reports* 10:799-812.
- Owen, W.L. (1984). Analysis and aggregation of CMHC outcome data in a statewide evaluation system: a case report. *Community Mental Health Journal*, 20:27-43.
- Rosen, A., Hadzi-Pavlovic, D., & Parker, G. (1989). The Life Skills Profile: a measure assessing function and disability in schizophrenia. *Schizophrenia Bulletin* 15:325-337.
- Sisk, J.E. (1987). Discussion: Drummond's "Resource allocation decisions in health care: a role for quality of life assessment?". *Journal of Chronic Disease*, 40:617-619.
- Snedecor, G.W. and Cochran, W.G. (1980). *Statistical Methods* (seventh edition). Iowa State University Press, Ames, Iowa.
- Spitzer, W.O. (1987). State of science 1986: quality of life and functional status as target variables for research. *Journal of Chronic Disease*, 40:465-471.
- Stahler, G.J. & Rappaport, H. (1986). Do therapists bias their ratings of patient functioning under peer review? *Community Mental Health Journal*, 22:265-274.
- Susser, M. (1990). Disease, illness, sickness; impairment, disability and handicap. *Psychological Medicine*, 20:471-473.
- Ware, J.E., Jr. (1987). Standards for validating health measures: definition and content. *Journal of Chronic Disease*, 40:473-480.
- Weltzien, R.T. Jr., McIntyre, T.J., Ernst, J.A., Walsh, J.A. & Parker, J.K. (1986). Crossvalidation of some psychometric properties of the CSQ and its differential return rate as a function of token financial incentive. *Community Mental Health Journal*, 22:49-53.
- Wood, P.H. (1980). Appreciating the consequence of disease: the classification of impairments, disability and handicaps. *The WHO Chronicle*, 34:376-380.
- Wood, W.D. & Beardmore, D.F. (1986). Prospective payment for outpatient mental health services: evaluation of Diagnosis-Related Groups. *Community Mental Health Journal*, 22:286-291.

## APPENDIX A

### Multnomah Community Ability Scale (Single Sheet Format) Western Mental Health Research Center

Client Name or ID Number \_\_\_\_\_ Rater \_\_\_\_\_ Date \_\_\_\_\_

**INSTRUCTIONS:** This scale is intended for use with extremely mentally or emotionally disabled clients. To complete the scale, the primary casemanager should circle the appropriate number for each question which corresponds with the client's current functioning, considering as useful the past 3 months *except for section 4—behavioral problems*, which should reflect the client's current level of functioning, considering when useful the *past year*.

#### Section One: *INTERFERENCE WITH FUNCTIONING*

This section pertains to those physical and psychiatric symptoms that make life more difficult for your client. Many of these can be lessened with medications but others are permanent. Regardless, rate your client as he/she functions with current medication regimen.

1. *Physical Health:* How impaired is your client by his/her physical health status?  
NOTE: Impairment may be from chronic health problems and/or frequency and severity of acute illness.

1. Extreme health impairment
2. Marked health impairment
3. Moderate health impairment
4. Slight health impairment
5. No health impairment
- ?. Don't know

2. *Intellectual Functioning:* What is your client's level of general intellectual functioning? NOTE: Low intellectual functioning may be due to a variety of reasons besides congenital mental deficiency: e.g. organic damage due to chronic alcohol/drug abuse, senility, trauma, etc. It should, however, be distinguished from impaired cognitive processes due to psychotic symptoms, which are covered in later questions. Rate estimated IQ independent of psychotic symptoms.

1. Extremely low intellectual functioning
2. Moderately low intellectual functioning
3. Low intellectual functioning
4. Slightly low intellectual functioning
5. Normal or above level of intellectual functioning
- ?. Don't know

3. *Thought Processes:* How impaired are your client's thought processes as evidenced by such symptoms as hallucinations, delusions, tangentiality, loose associations, response latencies, ambivalence, incoherence, etc.?

1. Extremely impaired thought processes
2. Markedly impaired thought processes
3. Moderately impaired thought processes
4. Slightly impaired thought processes
5. No impairment, normal thought processes
- ?. Don't know

4. *Mood Abnormality:* How abnormal is your client's mood as evidenced by such symptoms as constricted mood, extreme mood swings, depression, rage, mania, etc. NOTE: Abnormality in this area may include any of the following: range of moods, level of mood, and/or appropriateness of mood.

1. Extremely abnormal mood
2. Markedly abnormal mood
3. Moderately abnormal mood
4. Slightly abnormal mood

5. No impairment, normal mood
- ? Don't know

5. *Response to Stress & Anxiety:* How impaired is your client by inappropriate and/or dysfunctional responses to stress and anxiety? NOTE: Impairment could be due to inappropriate responses to stressful events (e.g. extreme responses or no response to events that should be of concern) and/or difficulty in handling anxiety as evidenced by agitation, perseveration, inability to problem-solve, etc.

1. Extremely impaired response
2. Markedly impaired response
3. Moderately impaired response
4. Slightly impaired response
5. Normal response
- ? Don't know

\_\_\_\_\_ SUMMED SCORE  
FOR SECTION ONE

#### Section Two: *ADJUSTMENT TO LIVING*

This section pertains to how your client functions in his/her daily life and how he/she has adapted to the disability of mental illness. Rate behavior, not potential.

6. *Ability to Manage Money:* How successfully does your client manage his/her money and control expenditures?

1. Almost never manages money successfully
2. Seldom manages money successfully
3. Sometimes manages money successfully
4. Manages money successfully a fair amount of the time
5. Almost always manages money successfully
- ? Don't know

7. *Independence in Daily Life:* How well does your client perform independently in day-to-day living? NOTE: Performance includes personal hygiene, dressing appropriately, obtaining regular nutrition, and housekeeping.

1. Almost never performs independently
2. Often does not perform independently
3. Sometimes performs independently
4. Often performs independently
5. Almost always performs independently
- ? Don't know

8. *Acceptance of Illness:* How well does your client accept (as opposed to deny) his/her disability?

1. Almost never accepts disability
2. Infrequently accepts disability
3. Sometimes accepts disability
4. Accepts disability a fair amount of the time
5. Almost always accepts disability
- ? Don't know

\_\_\_\_\_ SUMMED SCORE  
FOR SECTION TWO

#### Section Three: *SOCIAL COMPETENCE*

This section pertains to the capacity of your client to engage in appropriate interpersonal relations and culturally meaningful activity.

9. *Social Acceptability:* In general, what are people's reactions to the client:

1. Very negative
2. Fairly negative
3. Mixed, mildly negative to mildly positive
4. Fairly positive
5. Very positive
- ? Don't know

10. *Social Interest:* How frequently does your client initiate social contact or respond to others' initiation of social contact:

1. Very infrequently
2. Fairly infrequently
3. Occasionally
4. Fairly frequently
5. Very frequently
- ? Don't know

11. *Social Effectiveness:* How effectively does he/she interact with others? NOTE: "Effectively" refers to how successfully and

appropriately the client behaves in social settings, i.e., how well he or she minimizes interpersonal friction, meets personal needs, achieves personal goals in a socially appropriate manner, and behaves prosocially.

1. Very ineffectively
2. Ineffectively
3. Mixed or dubious effectiveness
4. Effectively
5. Very effectively
- ?. Don't know

12. *Social Network*: How extensive is the client's social support network? NOTE: A support network may consist of family, friends, acquaintances, professionals, coworkers, socialization programs, etc. Note: How extensive the network is does not depend on the social acceptability of the sources.

1. Very limited network
2. Limited network
3. Moderately extensive network
4. Extensive network
5. Very extensive network
- ?. Don't know

13. *Meaningful Activity*: How frequently is your client involved in meaningful activities that are satisfying to him or her? NOTE: Meaningful activities might include arts and crafts, reading, going to a movie, etc.

1. Almost never involved
2. Seldom involved
3. Sometimes involved
4. Often involved
5. Almost always involved
- ?. Don't know

SUMMED SCORE

\_\_\_\_\_ FOR SECTION THREE

#### Section Four: *BEHAVIORAL PROBLEMS*

This section pertains to those behaviors that make it more difficult for your client to integrate successfully in the community or comply with his/her prescribed treatment.

NOTE: Rate client's current behavior, considering as appropriate events during the past year.

14. *Medication Compliance*: How frequently does your client comply with his/her prescribed medication regimen? NOTE: This question does not relate to how much those medications help your client.

1. Almost never complies
2. Infrequently complies
3. Sometimes complies
4. Usually complies
5. Almost always complies
- ?. Don't know

15. *Cooperation with Treatment Providers*: How frequently does your client cooperate as demonstrated by, for example, keeping appointments, complying with treatment plans, and following through on reasonable requests?

1. Almost never cooperates
2. Infrequently cooperates
3. Sometimes cooperates
4. Usually cooperates
5. Almost always cooperates
- ?. Don't know

16. *Alcohol/Drug Abuse*: How frequently does your client abuse drugs and/or alcohol? NOTE: "Abuse" means to use to the extent that it interferes with functioning.

1. Frequently abuses
2. Often abuses
3. Sometimes abuses
4. Infrequently abuses
5. Almost never abuses
- ?. Don't know

17. *Impulse Control*: How frequently does your client exhibit episodes of extreme acting out? NOTE: "Acting out" refers to such behavior as temper outbursts, spending sprees, aggressive actions, suicidal gestures, inappropriate sexual acts, etc.

1. Frequently acts out
2. Acts out fairly often
3. Sometime acts out
4. Infrequently acts out
5. Almost never acts out
- ?. Don't know

\_\_\_\_\_ SUMMED SCORE  
FOR SECTION FOUR  
\_\_\_\_\_ TOTAL SCORE  
(SUM SECTION SCORES)

(c) Sela Barker and Nancy Barron  
(Network Behavioral Healthcare, Inc. and  
Multnomah County Community and Family  
Services Division)