A modification of the Mental Status Questionnaire using questions requiring the recall of basic memory is described. After interviewing 254 elderly people, the responses to six questions were found to meet the criteria for Guttman scaling, and each respondent was assigned a score which characterized the extent of his memory loss. After a 14-month-follow-up, it was found that a statistically significant proportion of the low scores, i.e., those with more memory loss, had died. The technique described is useful for comparing respondents' extent of memory loss both to assess high risk groups and to evaluate gains made from specific remotivation programs.

A Guttman Scale to Assess Memory Loss Among the Elderly[1]

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There is both clinical and empirical evidence suggesting not only that memory loss associated with organic brain damage is common among the institutionalized elderly (Busse, 1959; Goldfarb, 1964; Kay, Beamish, & Roth, 1964; Lowenthal, 1967) but also that knowing the extent of memory loss is of prognostic value. Specifically, whenever an old person's memory is impaired, he is at a greater risk of dying than his more intellectually intact institutionalized counterparts (Blenkner, 1967; Markus, 1970). A widely-used test for rapid screening and identification of the aged with organic impairment is the Mental Status Questionnaire (MSQ), developed by Kahn, Goldfarb, Pollack, and Peck (1960) and consisting of ten questions ranging from orientation to place to knowledge of the current president of the United States.

This paper describes a modification of the MSQ that, like the MSQ, is easily scored but has the added advantages of unidimensionality and a scoring pattern by which each individual score tells the examiner which items have been missed. It is suggested that this technique is especially useful for comparing respondents' extent of memory loss both to assess high risk groups and to evaluate gains made from specific remotivation programs.

The Old People Studied

The technique described here was developed as part of a study designed to measure the impact of attempts to improve the treatment and living situations of psychiatrically impaired elderly patients, admitted to New York State mental hospitals for any reason and receiving care in a variety of settings, including custodial geriatric wards, a geriatric day hospital, and sheltered living in a motel-like community setting. The particular institutions were selected because they represented a variety of living arrangements and treatment modalities for the ambulatory psychiatrically impaired elderly; these ranged from graded rehabilitation programs with reality orientation specifically designed to reverse mental confusion (Folsom, 1968) to custodial care.

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Elderly people with extreme memory loss are capable of retention of basic information and skills.

The sample of patients drawn from these settings consisted of 254 elderly people who were 65 years of age or over, ambulatory, and capable of at least rudimentary self-care (these include basic activities of daily living such as eating, dressing, bathing) at both time of sample selection and initial interview. The sample included all old people meeting these criteria and receiving care in two experimental programs for the aged and their matched controls at two more traditional New York State mental hospitals.

These old people were a diverse group, comprised of 57 males and 198 females and representing a cross section of the ambulatory geriatric mental hospital population. Of these, 88% were white, the remainder were black. The mean age for males was 72 years, 2 months, and the mean age for females was 73 years, 6 months. Eighty-four percent of the sample were from lower socioeconomic backgrounds (Class IV-V, Hollingshead's ISP). While over two-thirds had been admitted within the last 3 years, there was a small proportion (12%) who had been hospitalized for 10 or more years. Psychiatric diagnosis, while available for the sample, thus did not always reflect the current mentational functioning of each respondent. Diagnoses were often outdated and sometimes cursory, especially for those elderly who were admitted in a crisis situation.

Measuring Memory Loss

To assess the extent of memory impairment in each respondent, it was decided to use a modification of the MSQ (Kahn et al., 1960) in which two questions of that instrument were dropped and several others were combined.[4] The two questions deleted required the respondent to name the current president of the United States and his predecessor, and while information questions such as these are widely used in psychiatric evaluations, it seemed probable that these relied more heavily on a knowledge of current events than might be realistically expected in an institutionalized population with little opportunity to follow current events. Furthermore, there is at least some experimental evidence suggesting that memory loss among old people may be due in part to differences in initial acquisition of specified material than in differences in their ability to retain information (Hulicka & Weiss, 1965). To the extent that old people are either unable to follow current events readily or find these current events (even the election of a president)

4. Combined into one were two questions on date of birth; two questions on address were also combined into one.

irrelevant to their present lives, one might expect to find a lower proportion of correct general information answers in this age group (Istomina, Samokhvalova, & Preobrazhenskaya, 1967). Last, we found that many elderly people resented being asked questions of a general information nature whether or not they knew the correct response.

A Memory Loss Scale

The questions asked dealt with orientation to place, time, and ability to recall simple but basic facts such as age, date of birth, and street directions. Table 1 lists questions found to form a Guttman scale (Stouffer, Lumsdaine, Lumsdaine, Williams, Smith, Janis, Star, & Cottrell, 1950).

Table 1. Content of Memory Loss Scale.

Question	Correct Response	% of Sample Answering Correctly
How old were you on your last birthday?	accurate age according to best source	61
What is your address?	correct current address	55
What is your date of birth?	correct day, month, year	50
What is today's date?	correct year, month, day ± 3 days	42
	correct day	36
How would you get to ————? (*Common reference point known to respondent, i.e., nearest cross street, community store in hospital, subway, etc.*)	full explanation correct	28

The responses to these questions enabled respondents' scores on the test to be ranked from zero to six, where zero represents the lowest scale score with no items answered correctly, and six represents the highest score with all items answered correctly. The following procedure was used to develop the scale.

The correct response to each question was assigned a value ranging from "one" for the easiest question (age last birthday) to "32" for the most difficult question (accurate directions to a place known by the respondent). The value for each correct answer doubles as the questions get more difficult. Each respondent was then assigned a sum score which reflected the questions he answered correctly. As an example, if a respondent answered the three easiest questions correctly, he would receive a sum score of seven. If another respondent answered the two easiest questions and the most difficult question correctly, he would receive a sum score of 35. Since there is only one answer pattern which can sum to a score of 35, it is possible to know from the score which questions were answered correctly. On the basis of the sum score, each respondent was scaled and assigned a value which best reflected his answer pattern. A sum score of seven is easy to scale since the respondent answered the three easiest questions correctly for a perfect scale score of 3. A respondent who scores 35, however, did not correctly answer in order of increasing difficulty and must be assigned to a perfect scale group in a way which produces the smallest number of errors. This procedure is valid only when imperfect scores are distributed randomly, as is the case with our scale. The total scale error (10%) meets the criteria for the minimal reproducibility necessary for a series of items to be regarded as approximating a perfect unidimensional scale (Ford, 1950).

The advantages of a Guttman scale to assess memory loss are twofold. First, the near-perfect scalogram pattern of responses indicates that the items asked are tapping a single dimension of memory loss believed to be associated with organic impairment rather than either several dimensions of memory loss or lack of information on a given topic due to any number of factors. A second advantage of the scale just described is that knowing an individual's score on the test makes it possible, without consulting the original set of responses, to know which items he missed. Such a technique is especially useful not only for rapid screening purposes but also to trace the fate of a cohort of elderly respondents over time.

An Illustrative Use of the Scale

The same questions were administered to the 254 elderly people in the sample in a variety of living situations and then followed up 1 year later to ascertain whether the memory loss scale score was an accurate predictor of group mortality.

Those elderly with greater memory loss were significantly more likely to die than those with higher scores ($p = < .05 > .02$, Smirnov test). At follow-up, 23% of the low scorers were dead while only 3% of the high scorers had died. To determine whether memory loss score was a more efficient predictor of mortality than various measures of physical functioning, scores on a series of items relating to ability to perform basic Activities of Daily Living (bathing, eating, dressing, and ambulation indoors and outdoors) and self-assessments of over-all physical health were examined. Neither ADL score nor self-rating of physical health was a significant predictor of mortality. It would seem that, while the relationship between memory loss and subsequent mortality is far from a 100% prediction level, degree of memory loss is, nonetheless, a more useful predictor of death than level of physical functioning or self-perception of over-all health. Interestingly, score on the memory loss scale is neither related to self-reports of ability to perform Activities of Daily Living (Lawton, 1963) nor to the illness state of the individual at time of interview. Illness state was defined from patients' medical records and ranges from none or minor illnesses, such as a cold, corns, bunions, etc., through serious conditions, such as hypertension, to disorders diagnosed as terminal (e.g., cancer with metastases to the brain and spinal column) in the case record. Given this particular sample of ambulatory elderly who were, by and large, capable of self-care, that memory loss is unrelated to physical decay is not particularly surprising. Put differently, since the elderly included in the study group were capable of responding to questions, they may have represented a "biologically elite" group of the mentally impaired in their age group. Certainly no one in the sample, as we were able to ascertain, was suffering from an acute toxic confusion or any other acute process so often associated with memory loss and mental confusion among the aged.

Conclusions

Data are presented on 254 psychiatrically impaired elderly people residing in a variety of facilities serving the mentally ill. Each person was administered a modified version of the Mental Status Questionnaire. Results from this test were analyzed by a scalogram technique developed by Guttman and were found to meet the criteria of a Guttman scale.

Follow-up information was collected on the sample. It was found that there was a statistically significant greater number of deaths among the low scorers than the high scorers, suggesting that the memory loss scale described herein has possible use as a predictor of group mortality in a given year. At any rate, severe memory loss, as demonstrated on this test, is a better predictor of death than either ability to perform activities of daily living or self-assessment of over-all health.

It is suggested that this test has considerable potential value not only as a screening instrument for research and clinical purposes but also when it is desirable to know exactly how memory may have increased or decreased within a given time period.

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