INFORMATION TO USERS

This reproduction was made from a copy of a document sent to us for microfilming. While the most advanced technology has been used to photograph and reproduce this document, the quality of the reproduction is heavily dependent upon the quality of the material submitted.

The following explanation of techniques is provided to help clarify markings or notations which may appear on this reproduction.

1. The sign or “target” for pages apparently lacking from the document photographed is “Missing Page(s)”. If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting through an image and duplicating adjacent pages to assure complete continuity.

2. When an image on the film is obliterated with a round black mark, it is an indication of either blurred copy because of movement during exposure, duplicate copy, or copyrighted materials that should not have been filmed. For blurred pages, a good image of the page can be found in the adjacent frame. If copyrighted materials were deleted, a target note will appear listing the pages in the adjacent frame.

3. When a map, drawing or chart, etc., is part of the material being photographed, a definite method of “sectioning” the material has been followed. It is customary to begin filming at the upper left hand corner of a large sheet and to continue from left to right in equal sections with small overlaps. If necessary, sectioning is continued again—beginning below the first row and continuing on until complete.

4. For illustrations that cannot be satisfactorily reproduced by xerographic means, photographic prints can be purchased at additional cost and inserted into your xerographic copy. These prints are available upon request from the Dissertations Customer Services Department.

5. Some pages in any document may have indistinct print. In all cases the best available copy has been filmed.
Eggert, Mary Ann

A STUDY OF CONCURRENT VALIDITY OF THE FULD OBJECT-MEMORY EVALUATION IN A VETERANS ADMINISTRATION MEDICAL CENTER SETTING

The Ohio State University

Ph.D. 1984

University Microfilms International 300 N. Zeeb Road, Ann Arbor, MI 48106
A STUDY OF CONCURRENT VALIDITY
OF THE FULD OBJECT-MEMORY EVALUATION IN A
VETERANS ADMINISTRATION MEDICAL CENTER SETTING

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By
Mary Ann Eggert, B.S., M.A.

* * * * *

The Ohio State University

1984

Reading Committee:
Lyle D. Schmidt, Ph.D.
Don M. Dell, Ph.D.
Theodore J. Kaul, Ph.D.

Approved By:
Lyle D. Schmidt
Advisor
Department of Psychology
ACKNOWLEDGMENTS

So many people have played a part in helping me get to this point in my academic career. However, I especially would like to acknowledge the help of Joseph Graca and Paul Fedirka in supervising my research at the Knoxville and Hines Veteran’s Administration Medical Centers, respectively. Many times they went out of their way to give advice or assist in obtaining subjects and their help was gratefully accepted. Jan and Jim Ellor provided marvelous hospitality during my visit to Chicago, and Jan also assisted in gaining the cooperation of the Hines nursing home staff. The staff at Knoxville, particularly Phil Laughlin, Bob Hall, Mary Radford, and Bob Hutzell provided much practical and emotional support for the project during my internship. Emotional support was also given in abundance by David Dettmann, Mary Morgan, Raymond Ho, Maggie Hayes, and Chris Kohn. Tom Hainlen deserves special thanks for his co-ratings of the Benton Visual Retention Tests.

I am grateful to my committee members, Ted Kaul, Dr. Schmidt, and Don Dell, who served so faithfully on all my committees. They exemplify the high quality of education I have received at Ohio State and I am proud to have been associated with them.

David Greth earns thanks for providing the equipment to "process" this work as well as allowing me the opportunity to put my interest in geriatric psychology into practice.

Finally, I thank my parents for instilling in me a love of knowledge, a sense of perseverance, and a belief that I could accomplish my goals. The confidence and love my parents and sisters shared with me cannot be described well except to say that my thanks to them is unbounded.
VITA

June 24, 1954 .......... Born - Milwaukee, Wisconsin

1976 .................. B.S., University of Wisconsin, Milwaukee, Wisconsin


1979-1980 ............. University Fellow, The Ohio State University, Columbus, Ohio

1980-1981 ............. Graduate Teaching Associate, The Ohio State University, Columbus, Ohio

1981 ................... M.A., The Ohio State University, Columbus, Ohio

1981-1982 ............. Head Graduate Teaching Associate, The Ohio State University, Columbus, Ohio

1982-1983 ............. Psychology Intern, Knoxville Veterans Administration Hospital, Knoxville, Iowa

1983-Present .......... Consultant, Gerontological Research Corporation, Mansfield, Ohio
TABLE OF CONTENTS

ACKNOWLEDGMENTS ........................................ ii
VITA .................................................. iii
LIST OF TABLES ...................................... v

Chapter

I. INTRODUCTION ...................................... 1
II. REVIEW OF LITERATURE ........................... 7
III. METHODOLOGY .................................... 25
IV. RESULTS .......................................... 36
V. DISCUSSION AND SUMMARY ....................... 52

REFERENCE NOTES ................................... 61
BIBLIOGRAPHY ......................................... 62

APPENDIXES

A. The Quick Test Items ......................... 70
B. Zung Self-Rating Depression Scale Items 72
C. Fuld Object-Memory Evaluation Items .. 74
D. Short Depression Scale from the MMPI (Short D) ........................................ 76
E. Rey Auditory-Verbal Learning Test Recording Form ................................ 78
F. Demographic Information Sheet .......... 80
G. Inclusion Criteria for Subject Selection .................................................. 82
H. Summary of Oral Presentation to Subjects 84
I. Written "Information About" Sheet ...... 86
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Descriptive Data from the Two Samples</td>
<td>37</td>
</tr>
<tr>
<td>2. Descriptive Data from the Aggregated Sample</td>
<td>39</td>
</tr>
<tr>
<td>3. Patients’ Diagnoses in the Two Samples</td>
<td>40</td>
</tr>
<tr>
<td>4. Pearson Product-Moment Correlations of Hypothesized Relationships in the Two Samples</td>
<td>42</td>
</tr>
<tr>
<td>5. Pearson Product-Moment Correlations of Hypothesized Relationships in the Aggregated Sample</td>
<td>44</td>
</tr>
<tr>
<td>6. Intercorrelation Matrix for Selected Memory Variables</td>
<td>45</td>
</tr>
<tr>
<td>7. Intercorrelation Matrix for Depression Variables</td>
<td>46</td>
</tr>
<tr>
<td>8. Intercorrelation Matrix for Memory and Depression Variables</td>
<td>50</td>
</tr>
</tbody>
</table>
CHAPTER I
INTRODUCTION

In the last two decades, the number of people over age 65 in the United States has increased dramatically, from 16,700,000 in 1960 to 25,500,000 in 1980 (U.S. Bureau of the Census, 1981). Along with this growth has come an increased interest in the psychology of aging (Birren & Sloane, 1980; Birren & Schaie, 1977; Poon, 1980a) including the study of geriatric assessment (Kane & Kane, 1981; Raskin & Jarvik, 1979; Storandt, Elias, & Siegler, 1978).

Schaie and Schaie (1977) describe three general purposes of geriatric assessment. First, it can provide data that would be useful in counseling older clients. Secondly, assessment of baseline behavior can help in measuring the effects of treatment, such as behavioral interventions or drug therapy. Third, assessment can assist in diagnosis, to determine if the aged person is suffering from psychopathology.

Given these three general purposes, psychological assessment might involve a variety of domains, such as personality, cognitive functioning, social adjustment, life satisfaction, and motivation. Within these domains, two areas are of particular importance. One area is memory
functioning. Salzman, Kochansky, and Shader (1972) advise that accurate assessment of memory function always should be included in a clinical evaluation of elderly patients. The second area of particular importance is depression. Estimates of the prevalence of affective disorders in the elderly range from 10 to 65%, and affective disorders constitute the most frequent psychiatric illness in this population (Georgotas, 1983). The present research focuses on the clinical assessment of memory, and secondarily, on depression.

The rationale for the assessment of memory can be considered with respect to the purposes of geriatric assessment described above. First, information from the assessment can provide a basis for counseling, particularly because memory decline is a major concern of many older persons. In a survey of noninstitutionalized people in San Francisco, it was discovered that approximately two-thirds of the people aged 75 and older were distressed about their perceived memory loss (Lowenthal, Berkman, Buehler, Pierce, Robinson, & Trier, 1967). Memory assessment information also could be helpful in reassuring older persons who may be anxious and upset about moderate or negligible slippage in memory performance which may be normative for them. If a serious decline is found to exist, appropriate treatments or methods of coping with the condition might be recommended to the older person or his/her family (Thompson, 1980).
Secondly, memory assessment information can provide a baseline for monitoring the effects of treatment. Arenberg and Robertson-Tchabo (1980) suggest that when changes in cognitive function, including memory, are detected in older persons, intervention strategies need to be developed to address these changes. Treatment strategies being developed for memory impairment in the elderly (Carroll & Gray, 1981; Goldberg, Syndulko, & Tourtellotte, 1980; Zarit, Gallagher, & Kramer, 1981) require baseline data on which to base their application and determination of their effects. These data also may be useful when the elderly person undergoes medical treatments, such as anesthesia or electro-convulsive therapy, which may produce side effects that influence memory functioning. In these cases, baseline data can indicate the occurrence and extent of side effects in order to reassure the person and improve the treatment (Williams, 1977).

A third reason to assess memory is that it provides the diagnostician valuable information. For instance, a change in memory functioning often precedes other indications of change in a person’s mental or physical condition (Williams, 1977). Differential diagnosis also falls in this category. A survey of professional staff involved with psychogeriatric patients and a corresponding review of representative case records revealed that the most common diagnostic questions for assessment centered around organicity and depression
Memory assessment has bearing on both these questions because memory impairment is a sign of organic brain syndrome and a common feature of depression (Wells, 1977). It is important to assess cognitive impairment and depression, and try to separate their effects when found together in pseudodementia, since the treatment of depression underlying pseudodementia may reverse the cognitive symptoms (Goldstein, 1979). Yet we are limited by the lack of information about the relationship between depression and difficulties in memory and learning (Fozard & Popkin, 1978).

Although numerous studies have shown correlations between memory impairment and degree of depression (e.g., Breslow, Kocsis, & Belkin, 1980; Breslow, Kocsis, & Belkin, 1981; Sternberg & Jarvik, 1976; Stromgren, 1977), the nature of this relationship is unclear. Several examples of the complex relationship between memory and depression can be given. In an often-quoted study, Kahn, Zarit, Hilbert, and Niederehe (1975) found an incongruity between actual memory performance and complaints about memory in elderly subjects. The complaints seemed to be a manifestation of depression, rather than actual memory dysfunction. Similarly, Brink (1981) indicated that self-ratings of memory are unreliable measures of memory impairment but may be more related to hypochondriasis, a concept closely associated with depression. In a third investigation of memory complaints, using
the Wadsworth Memory Questionnaire, elderly subjects showed significant effects for depression on 23 of 35 items, including all four items that asked for a self-evaluation of impairment (Goldberg, Syndulko, Lemon, Montan, Ulmer, & Tourtellotte, Note 1). Arenberg and Robertson-Tchabo (1980) point out that although these data may be interpreted to suggest that depression results in memory complaints, it is equally possible that perceived memory dysfunction leads to the depression. Yet another explanation suggests that an unknown third factor effects both.

Thompson (1980) gives several examples of how combinations of memory complaints, performance, and depression can affect diagnostic and treatment formulations. For example, if memory complaints and depression both are present but memory performance is normal, depression may be the "culprit". But if a patient has few memory complaints, poor memory performance, and few symptoms of depression, organic brain impairment may be indicated. Thus, although few studies of memory have included depression as a variable, it should be considered, especially when memory complaints are a focus (Thompson, 1980).

There has been a recent upsurge in the development of memory testing devices (Thompson, 1980), many of which lack desirable features such as control for previous exposure to the material, multiple trials, or provisions for delayed
recall (Erickson & Scott, 1977). In addition, most current memory tests do not take depression into consideration.

A test has been developed rather recently, however, that includes both memory and depression components—the Fuld Object-Memory Evaluation (Fuld, 1977). This test offers many desirable features, such as separate scores for storage, retrieval, and retention, a procedure that virtually guarantees attention, availability of norms for elderly subjects, and allowance for impairments of vision or hearing, as well as the experimental measure of depression. To date, the validation work has been done on elderly people in the community and in nursing homes (Fuld, 1977). Very little data have been available about the depression measure. Thus this test needs further validation of its memory and depression components. The purpose of the present study is to examine the concurrent validity of both the memory and depression components of the Fuld Test in an elderly Veterans Administration Medical Center population. Since the Fuld Object-Memory Evaluation is designed to assess both memory and depression, the question of the relationship between memory and depression in this population also will be explored briefly.
CHAPTER II
SELECTED REVIEW OF LITERATURE

The purpose of this study was to explore concurrent validity of the Fuld Object-Memory Evaluation in terms of both its memory and depression components. The first section of this review includes literature on desirable characteristics of measurement instruments of memory functions in the elderly. The Fuld Test will be evaluated according to these criteria and available data on the validation of this test will be given. The second section of the review will focus on the experimental measure for depression that the Fuld Test employs. Recommendations will be given for exploring concurrent validity of both the memory and depression components of the Fuld Test. Because the Fuld Object-Memory Evaluation is designed to assess both memory and depression, the third section will examine pertinent information on the relationship between memory and depression.

Measurement of Memory Functioning in the Elderly

Memory functioning in the elderly has been measured in numerous ways and several reviews of this literature are available (e.g., Erickson, Poon, & Walsh-Sweeney, 1980;
Erickson & Scott, 1977; Lezak, 1983). Instead of evaluating useful tests of geriatric memory that are currently in common use, data on the Fuld Test will be presented in terms of these criteria.

The first criterion for an effective memory test is that it uses meaningful stimuli, such as common objects rather than nonsense words or meaningless shapes (Albert, 1981; Erickson, Poon, & Walsh-Sweeney, 1980; Erickson & Scott, 1977; Poon, 1980b). Older persons might feel less threatened by the use of everyday items, as well as accord the tasks higher face validity. In this regard, the Fuld Test uses ten familiar objects, such as a button, key, and book of matches (Fuld, 1977).

Secondly, the memory test should provide normative data for elderly subjects; many current tests lack this information (Albert, 1981; Erickson, Poon, & Walsh-Sweeney, 1980; Erickson & Scott, 1977; Thompson, 1980). It cannot be assumed that elderly persons will perform as well as younger persons on whom most memory tests have been normed. The Fuld manual (Fuld, 1977) provides norms for persons over age 70 in nursing homes and in the community.

The availability of alternate equivalent test forms is a third criterion, so that persons may be retested (Erickson, Poon, & Walsh-Sweeney, 1980; Erickson & Scott, 1977). Again, Fuld (1977) has developed an alternate test
form of ten different objects, and reports virtually identical means and standard deviations for the two forms.

Often clinicians may have limited time to perform their assessment of memory. Thus brevity and ease of administration comprise a fourth desirable characteristic (Erickson & Scott, 1977; Poon, 1980b). Personal experience has demonstrated that the Fuld Test is indeed quick (taking less than ten minutes) and easy to administer. Short tests are especially desirable because elderly subjects may tire and as a result be less cooperative on lengthy tests.

A common criticism of other memory tests is that they do not control for initial learning (such as naming past U.S. presidents, which a person may never have learned) or for the amount of repeated exposure (Randt, Brown, & Osborne, Jr., 1980; Schaie & Schaie, 1979; Schaie & Zelinski, 1979). Often, too, tests focus on a person's ability to recall information that had been presented only once, rather than over a series of trials (Wells & Buchanan, 1977). A fifth criterion, therefore, involves controlling initial learning, and testing over a series of trials. The Fuld Test controls for initial learning because the ten objects are first presented in the testing session. The amount of exposure is controlled by the technique of "selective reminding," where the subject is reminded before each trial only of those items not recalled on the preceding trial (Buschke & Fuld, 1974; Fuld, 1977). Therefore, each
item has the same number of presentations, either by the examiner or by the subject. The five trials of the Fuld Test also permit construction of a learning curve.

A sixth criterion is the use of delayed recall as a help in differentiating types of pathology (Erickson & Scott, 1977). For example, amnesic persons sometimes can recall information immediately after its presentation, but not after a twenty minute delay (Schaie & Zelinski, 1979). The Fuld Test has a delayed recall trial, where the subject is asked to recall the ten items after a period of time. For each item missed, the subject is given a standard recognition trial of three choices.

Lawton (1979) indicated that older persons may be unable to complete tests if they have various receptive and response deficits. As a result, a seventh criterion was developed, that procedures allow for the age-related slowing of the motor and sensory systems (Erickson, Poon, & Walsh-Sweeney, 1980). Additionally, it may be helpful to use both auditory and visual modalities, to increase the amount of sensory input (Erickson & Scott, 1977). The Fuld objects offer auditory, visual, and tactile cues and the Fuld Test is paced to favor the elderly (Fuld, 1977). That is, the person handles the objects, verbalizes their names, sees the objects, and then hears the names of items she or he missed on a given trial. The subject is allowed sixty seconds for
each trial and the selective reminding allows for five seconds between words.

One of the primary purposes of memory assessment is to aid in diagnosis (Salzman, Kochansky, & Shader, 1972), and one indication of diagnostic utility, the eighth criterion, would be that the test differentiate between different groups of people. Fuld (1980) reported initial validity data to show that the Fuld Test successfully differentiated elderly persons found to be mentally intact on a mental status test from those moderately impaired. The mentally intact persons showed both a higher storage and a higher recall curve, and although both groups improved over the five trials, the intact individuals improved more.

A more complex example can be given of how the Fuld Test may meet this criterion for a memory test. Fuld (1982) had observed that patients with Alzheimer's dementia often intruded words that did not belong when they were asked to say words rapidly within categories. She defined an intrusion as "the inappropriate recurrence of a response (or type of response) from a preceding test item, test, or procedure" (p. 5). Using subjects who had taken four WAIS subtests, a mental status test, and the Fuld Test, she found that 21 of the 26 patients with Alzheimer's made intrusions, but only three of the 11 patients without Alzheimer's did so. Thus "intrusions" showed 81% sensitivity and 88% specificity for
Alzheimer's. In a similar study, Fuld, Katzman, Davies, and Terry (1982) found that the portion of the Fuld Test where the subject lists words rapidly in categories was the most useful in eliciting intrusions. Counting intrusions on all the tests given (the Fuld Test, four subtests of the WAIS, and a mental status test), intrusions had a sensitivity for Alzheimer's of 90%, with a specificity of 73%. Autopsies showed that intrusions were associated with a large plaque count in three cortical areas; plaque count is a prime indicator of Alzheimer's disease. Thus, intrusions on the Fuld rapid recall trials may help in the differential diagnosis of dementia.

A ninth criterion is that "memory tests should not correlate so highly with tests of intelligence as to be redundant" (Erickson & Scott, 1977, p. 1132). Memory appears to play an important role in tests purporting to measure other variables such as intelligence, and an independent measure of memory function would appear to be very useful (Schaie & Schaie, 1977). Because data on the relationship between the Fuld Test and intelligence are not available, one part of validation in the present study was to assess the degree of relationship between the Fuld Test and a standard intelligence test, the Quick Test (Ammons & Ammons, 1962).

Another criterion suggested by Erickson, Poon, & Walsh-Sweeney (1980) is that a test battery should give the
following quantitative data: 1) capacity of short-term storage and ability to register data; 2) efficiency of learning new information; 3) stability of the information learned in the testing; and 4) the integrity of remote recall for events learned in vivo. Similarly, Lezak (1976) noted that when a patient has difficulty with recall, the examiner should try to separate the retrieval problems from those caused by difficulty with storage. The Fuld Test offers separate scores for storage (the number of different items recalled at least once in the five trials), retrieval (the total number of items recalled, summed across the five trials), repeated retrieval or consistency (the number of times the same item was recalled on two successive trials), and ineffective reminders (the number of times an item was missed on two successive trials, despite the reminder). These scores comprise all but the fourth type of data suggested by Erickson, Poon, and Walsh-Sweeney (1980).

The availability of scores for retention, storage, and retrieval give the opportunity to explore which part of the memory process is most impaired in different populations. For example, Fuld (1980) presented data to suggest, in demented patients, storage may be more impaired than retrieval.

The Fuld task of retrieval from familiar categories, developed previously by Drachman and Leavitt (1972) provides more data on the memory process. Drachmann and Leavitt
postulated that this categories task is "probably an almost pure test of retrieval from old store when the stores themselves are not impaired" (p. 308). They found retrieval from categories was unimpaired in aged subjects compared to young subjects, and believe that a disorder of storage may instead be responsible for impaired memory in the aged. Support for the "retrieval from familiar categories task" also comes from Wells and Buchanan (1977) who advocate that tests for the assessment of dementia should include sections for both memory and fluency.

Another aspect of the memory process is assessed by the Fuld Test's technique of selective reminding. This technique is to remind the subject only of the items missed on a given trial. The procedure allows the subject to demonstrate long-term storage and consistency of retrieval without interference from additional intervening reminders of the items recalled (Buschke, 1973; Buschke & Fuld, 1974). The traditional free recall task allows responses to be made from both long-term and short-term memory (Buschke, 1977) and thus provides less information than the selective reminding technique used in the Fuld Test.

Finally, a memory test should be validated against some criterion of memory. This is complicated because memory, as a higher order function, expresses itself in performance and "is inextricably bound up with the functioning of the total person" (Erickson & Scott, 1977, p. 1131). Thus it is very
difficult, if not impossible, to find a clear criterion for memory in everyday behavior. As a preliminary step in establishing concurrent validity, performance on the Fuld Test instead was correlated with performance on two better-known tests of memory. The Benton Visual Retention Test (Benton, 1955), as its name implies, is a test of nonverbal memory; the Rey Auditory-Verbal Learning Test (Lezak, 1976) measures verbal memory. The Fuld Test appears to have elements of both visual and auditory memory. Comparison of the Fuld Test with both a verbal and nonverbal measure of memory may give more information about the relative strength of the verbal and nonverbal elements, as well as provide some concurrent validity data on memory functioning in general.

In summary, the memory component of the Fuld Test appears to meet most of the criteria recommended in the literature on memory. Several directions suggested for further concurrent validity research have been indicated above and are pursued in this study.

The Fuld Measure of Depression

Assessment of depression is complicated by the fact that "depression" can refer to a syndrome, a passing mood, or a symptom (Weissman & Myers, 1979). Although not all patients with symptoms of depression have the syndrome of an affective disorder (Klerman, 1983), the symptomatic definition of depression appears closest to that used in the Zung
Self-Reported Depression Scale (Zung, 1965) and the MMPI Short Depression Scale (Hutzell, Note 3). Thus in the present study, except where explicitly noted otherwise, depression refers to the psychological, affective, social, and physiological symptoms of a primary affective disorder.

One difficulty in determining depression is that psychological and affective "moods" tend to be private experiences that are difficult to assess on the basis of observed behavior unless they occur in the extreme (Salzman, Kochansky, Shader, & Cronin, 1972). Furthermore, most mood scales (as they are termed in the literature) are unsuitable for geriatric populations. Salzman et al. reviewed fifteen scales that have been or could be used to assess depression in elderly persons. Most are self-report inventories and several others require experts to make ratings. Only four have been designed for use by a nurse or nurse aide, and none of those received much favorable comment or widespread use. Because the self-report and observer-type ratings have been reviewed (Curland, 1980; Kane & Kane, 1981; Kochansky, 1979; Salzman, Kochansky, & Shader, 1972; Salzman, Kochansky, Shader, & Cronin, 1972), the following review will focus on "unobtrusive" depression measures similar to the one used in the Fuld Test.

The Lishman studies (1972a, 1972b, 1974) formed the basis for Fuld's (1977) "experimental measure for depression." Lishman (1972a) gave healthy subjects
topics as cues for writing sentences and had them complete an eight-item semantic differential scale about each topic's hedonic tone and impact level. Two weeks later the subjects were asked to recall the topics. The hedonic scores were higher for the topics that were recalled during the second session than for those not recalled. The tendency for more pleasant than unpleasant topics to be recalled was most pronounced in the subjects over age 39, irrespective of the subject's sex.

This procedure was repeated with a sample of inpatients suffering from affective disorders (Lishman, 1972b). Although the depressed patients showed a tendency toward higher negative hedonic tone for the topics they recalled, these results were considered preliminary due to a small sample size.

Lishman (1974), using middle-aged volunteers, tested the time it took to recall pleasant or unpleasant experiences when given stimulus words. He found that the recall of pleasant experiences was faster than the recall of unpleasant ones.

Lloyd and Lishman (1975) asked depressive patients under the age of 60 to recall pleasant experiences in response to one list, and unpleasant experiences in response to a second list. Their degree of depression was assessed with the Beck Depression Inventory. In more severely depressed patients, unpleasant experiences were recalled more rapidly;
in less depressed patients, this relationship was reversed. On the whole, this sample of depressed patients did not show the tendency for pleasant memories to be recalled faster than unpleasant memories. The data suggest that depression may speed up the recall of unpleasant memories. For the subjects who were retested when they showed less depression, the pleasant experiences tended slightly to be recalled more quickly. Thus, the obtained results probably are not due solely to depressed persons having had more negative experiences to recall, because, serving as their own controls, their pool of experiences remained the same. The effect also does not appear due to recency of the events because this variable was not significant when analyzed.

Breslow, Kocsis, and Belkin (1981) used another type of task in an attempt to differentiate depressed from normal subjects. They tested the hypothesis that depressed patients would show memory problems on a story recall task because of selective inattention to the positive elements of the story. They constructed a 350-word story that had 6 neutral, 10 positive, and 10 negative elements. After the story was read aloud twice to the subjects and they were given a ten-minute distracting task, they were asked to record as much of the story as they could recall. In comparison with a control group, the depressed patients recalled a similar percentage of negative and neutral
themes, but 20% fewer positive themes, which was statistically significant. The affective tone of the elements appeared to influence recall. The authors speculate that depressed persons tend to select elements in a given situation that are consistent with their negative world view. It might be anticipated, therefore, that depressed persons would produce more negative than positive items when they are requested to list items rapidly within the happy and sad categories.

These five studies offer limited and indirect support for the notion that recall of "things that make people happy" versus "things that make people sad" will indicate the presence or absence of depression. But only two reports could be found about the depression measure of the Fuld Test itself. In 1977, Fuld reported that she had unpublished data that every individual of the 41 psychiatric outpatients she tested who gave more sad words than happy words had a clinical diagnosis of depression. The age of these patients was not given, and apparently no attempt was made to relate the magnitude of the "sad" bias to the subjects' level of depression. In a normative study, Fuld (1980) reported that 19 of the 32 elderly subjects in the community and 18 of the 32 institutionalized subjects gave more responses to "things that make you happy" and that four and seven subjects of the respective groups gave an equal number of responses to both
sad and happy. Again, Fuld did not assess level of depression in this study.

It seems the depression measure in the Fuld Test might offer some promise, based on the limited amount of research that has been reported. If the difference in rapid recall between "things that make people happy" and "things that make people sad" distinguishes between depressed and non-depressed people, this simple task could be useful to insert in cognitive tasks as a very quick screening device. However, this task must be evaluated more thoroughly before a judgment can be made.

Relationship of Memory and Depression

Although both memory and depression have been studied extensively, their relationship has received relatively little attention. Stromgren (1977) reviewed the literature on the influence of depression on memory and concluded that a marked difference of opinion exists. Almost all the studies he reviewed involved patients with a clinical diagnosis of depression rather than depression measured by a mood scale. In his own research, Stromgren found many small correlations between memory function on the Wechsler Memory Scale and degree of depression on a specially designed rating scale. But he concluded that only a small amount of the variance in memory was attributable to depression, and he suggested that intelligence probably was a much more significant influence on the results.
Some research supports the view that depression has a negative effect on cognitive functioning. For example, Miller (1975) reviewed the literature on psychological deficits in depression and reported that psychotic depressives and manic-depressives evidenced memory deficits when severely depressed compared to their performance when mildly depressed. Neurotic depressives showed memory impairment when compared to non-depressed people. However, the research he cited often did not include a definition of depression and the influence of important variables such as intelligence was overlooked. Breslow, Kocsis, and Belkin (1980) reported substantial evidence for memory impairment on the Wechsler Memory Scale in depressed persons over age 18 compared to normal controls. Yet Friedman (1964) found a minimal effect of severe depression on cognitive functioning, in subjects aged 39 to 79 that had been diagnosed as depressed.

Perhaps these conflicting results are due to different learning conditions. For example, Weingartner, Cohen, Murphy, Martello, and Gerdt (1981) reported that moderately depressed middle-aged subjects (as revealed by the Hamilton Depression Scale) tended to have impaired performance on a learning task under some conditions only. They were less effective than control patients in recalling semantically processed words, but did not differ from controls when the lists were highly organized. Sternberg and Jarvik (1976)
found that patients with endogenous depression had a marked impairment in short-term but not long-term memory, compared to controls, and improvement in depression led to improved performance on short-term memory tests. However, the age of subjects was not reported, and depression was based on clinical diagnosis.

Since Miller’s (1975) review, few studies have examined systematically the relationship between memory and depression; anecdotal evidence with small samples predominates. Sweet (1983), for example, presented data on five patients who exhibited major effects of depression on neuropsychological tests, including tests of memory. He suggested that although little is known about the effects of depression on such tests, it appears that depression negatively affects at least some individuals.

As can be seen, most studies of memory and depression examined subjects who were clinically depressed, and data from persons of different ages tended to be aggregated. In an effort to overcome these possible limitations, the present research will examine briefly the relationship of memory performance of elderly veterans to their scores on common symptomatic depression tests.

**Summary and Recommendations**

Research on the measurement of memory and depression as well as their interrelationship has been reviewed. It has
been noted that the Fuld Test meets many of the criteria suggested in the literature for a well-designed geriatric memory test. That is, the Fuld Test is brief, uses familiar stimuli, controls for previous learning, has equivalent forms, provides both visual and auditory cues, has norms for elderly persons, and offers diagnostic assistance. It separates the elements of retention, storage, and retrieval, and allows for the measurement of delayed recall. The Fuld Test also has an experimental measure for depression.

Although the Fuld Test has the aforementioned qualities, further validation of the memory and depression components are warranted. Thus, the purpose of the present study was to examine concurrent validity of the Fuld measures of depression and memory. Because it was not known to what extent the Fuld Test correlates with intelligence, the present research first investigated the relationship of the Fuld Test to the Quick Test (Ammons & Ammons, 1962) measure of intelligence. This was done as a procedural check to determine if the effects of intelligence should be partialled from the relationships between scores on the memory tests. The relationship of the Fuld Test to other measures of memory is unknown. Concurrent validity of the Fuld memory measure was studied using both a verbal (Auditory Verbal Learning Test—Lezak, 1976) and nonverbal (Benton Visual Retention Test—Benton, 1974) measure of
memory. The concurrent validity of the Fuld depression measure was examined by investigating the relationship between the Fuld and two better-validated depression measures, the Zung Self-Rating Depression Scale (Zung, 1965) and a shortened version of the MMPI depression scale (Hutzell, Note 2).

The following hypotheses were tested:

**Hypothesis 1:** The level of total recall on the Fuld Test will be positively related to the total recall score on the AVLT.

**Hypothesis 2:** The level of total recall on the Fuld Test will be inversely related to the number of errors on the BVRT.

**Hypothesis 3:** The level of depression on the Fuld Test will be positively related to the Zung SDS score.

**Hypothesis 4:** The level of depression on the Fuld Test will be related positively to the Short D depression score.
CHAPTER III
METHODOLOGY

Population

The target population for this study was male veterans at least 60 year of age who were inpatients in a Veterans Administration Medical Center. The division between middle-aged and elderly adults was set arbitrarily, although it is not without precedent in similar studies of memory in the aged (Cauthen, 1977; Crook, Gilbert, & Ferris, 1980; Randt, Brown, & Osborne, Jr., 1980). An inpatient population was selected because the Fuld Test primarily is aimed at elderly persons who may be suffering from some cognitive impairment. Veterans were chosen because the Fuld Test has not been studied in this population.

Subjects

Two samples of veterans were obtained. The first sample was from a neuropsychiatric facility, the Knoxville Veterans Administration Medical Center in Iowa. The second, for replication purposes, was from a general medical and surgical facility, the Veterans Administration Medical Center in Hines, Illinois. Data were collected from the Knoxville
sample between January and May 1983 and from the Hines sample in July and August 1983.

The sample size at each hospital was set at 28, based on .80 power of finding large effects (.5), with alpha set at .05. Two additional subjects at Knoxville completed the entire battery except for the Benton Visual Retention Test, which they could not manage due to motor impairment. One subject in the Hines sample was unable to complete the Benton due to a very recently fractured arm. The data from these three subjects will be included in the analyses except for those which require the Benton scores. One Hines subject completed the entire battery except the last two trials of the Auditory Verbal Learning Test. The score he attained on the third trial was used for his missing scores on trials four and five; this was probably a conservative estimate and least likely to bias the results. Three subjects were dropped from the analyses entirely, one due to an IQ score under 40 on the Quick Test, the other two due to their choosing to discontinue the research during the Fuld Test. So N=30 in the Knoxville sample and N=28 in the Hines sample for most analyses.

The participants' mean age was 68.8 years, with a range from 59 to 94. (One 59-year-old was included when no other veterans were available who met the inclusion criteria; his memory and depression scores were lower than average, and all within 1.4 s.d. from the sample mean). The
participants' level of education ranged from 5 years to college education, with a mean of 11.2 years. Most (N=33) of the participants rated their health as fair or poor; 25 indicated good or excellent. See Chapter IV for further description of the two samples.

Instruments

Six instruments were administered to each subject, including a measure of intellectual functioning (the Quick Test), two measures of depression (the Zung Self-Rating Depression Scale and a 15-item scale extracted from the MMPI depression scale), and three measures of memory function (the Fuld Object-Memory Evaluation, the Benton Visual Retention Test, and the Rey Auditory Verbal Learning Test). A demographic questionnaire sheet also was completed.

The Quick Test (Ammons & Ammons, 1962) is a 50-item multiple choice picture-vocabulary test that estimates general intellectual level. It was selected because it is brief (5-10 minutes) and it correlated .876 with the full-scale WAIS in the elderly (Levine, 1971). Form 3 was used because it provides the best predictor of WAIS IQ in elderly adults (Peteroy & Pirrello, 1981). Test items are listed in Appendix A. Performance on the Quick Test has been found to be unaffected by institutionalization or chronic illness, socioeconomic status, anxiety level, or age within an elderly sample (Gendreau, Roach, & Gendreau, 1973).
Gendreau et al. recommend that IQ's be calculated and then 13 points added to each as a correction factor with elderly subjects, to approximate a normal distribution with a mean of 100 and a standard deviation of 15. This correction factor is similar to that recommended to Levine (1971) by Ammons and Ammons, and was used in the present study.

The Zung Self-Rating Depression Scale (SDS) (Zung, 1965) is a 20-item scale that measures symptoms of depression, including a pervasive mood of depression and corresponding psychological and physiological disturbances. The SDS was administered orally to decrease the possibility that the subject would get confused by the rating sheet. An oral procedure that was similar but introduced some subjective observations on the part of the rater still generated data that correlated .87 with the patient's self-reported SDS (Zung, 1972). Each item was marked on a four-point scale, from "none or little of the time" to "most or all of the time." (See Appendix B). The total points (range 20-80) were computed and then transformed to a percentage of 80; thus, total scores could range from zero to 100. This transformation did not change the distribution of scores, but made it possible to compare means in the present research with those obtained in Zung's studies. Raw scores on the affective, physiological, psychomotor, and psychological subscales also were computed.
The SDS was selected because it is a well-validated depression scale that has been used successfully with elderly patients (Freedman, Bucci, & Elkowitz, 1982; Heidell & Kidd, 1975; Zung, 1967). McNair (1979) noted that the SDS had been used more than any other scale with the elderly for self-ratings of depression. Dye (1982), in a review of research on the SDS, cited its convergent validity of .65 with the MMPI Scale 2 (Depression), good discriminant validity (i.e. not correlated with subjects' sex, age, financial status, educational level, marital status, or intellectual level) and reasonable face validity. The items correspond well to the DSM-III criteria for major depression; in one study, the SDS correctly classified 80% of geriatric patients according to DSM-III criteria for diagnosis (Okimoto, Barnes, Veith, Raskind, Inui, & Carter, 1982).

The Fuld Object-Memory Evaluation (Fuld Test) (Fuld, 1977) is a test of memory and learning designed for impaired and unimpaired aged individuals. It consists of ten common objects in a bag. Subjects first are asked to see if they can identify the objects by touch, and then to pull the objects out "to see if you are right." The subject is distracted by asking him to list names for 60 seconds, and then asked to recall the objects in the bag within a 60-second time limit. The names of omitted items on a given trial are recited by the examiner slowly and clearly. The
subject is distracted after the next four trials, respectively, with 60-second listing of food, things that make people happy, vegetables, and things that make people sad. In the present study, the inter-trial periods of listing were increased from 30 seconds at the suggestion of Fuld (Note 3) to allow for more variability.

The test was scored for total recall (the total number of items recalled on the trials), storage efficiency (the total number of different items recalled without reminding on successive trials), and ineffective reminders (failure to use the feedback given about an omission on the previous trial). The subjects received a depression score based on subtracting the number of "things that make people happy" from the number of "things that make people sad," and the total number of items in their rapid listings of names, food, and vegetables also were recorded. A delayed recall score consisted of the number of Fuld Test items recalled or recognized from three choices after the subjects had completed the SDS and Short D. (See the recording form in Appendix C).

The Short Depression Scale from the MMPI (Short D) (Hutzell, Note 2) consists of 15 items selected from the MMPI depression scale. These items were found to correlate best with the full MMPI scale 2, and when cross-validated, they correlated .82 with the full MMPI scale 2 administered three to five days later. In a geriatric V.A. sample, this
15-item scale showed a 4-day test-retest reliability of .81. This measure was chosen because it is brief and easy for the subjects to complete, providing a second measure of depression that is based on a widely-accepted instrument used in clinical diagnosis. Items are listed in Appendix D.

The Benton Visual Retention Test (BVRT) (Benton, 1955) is a commonly-used test of nonverbal memory that consists of seven cards with geometric figures on them. Each subject was given one card of Form B to familiarize him with the task and determine the quality of his visuographic performance (Lezak, 1976). Then Form A was given under Administration A procedures, where the cards were exposed to the subject for 10 seconds, and the subject was asked for immediate recall by drawing the designs from memory. Afterward, he drew the same seven designs by copying the cards. This procedure with the BVRT has been used successfully with elderly subjects and produced acceptable reliability, with a six-year test-retest correlation of .87 (Arenberg, 1978; Arenberg, 1982). Scoring was based on Benton's system of errors for distortions, omissions, rotations, perseverations, misplacements, and errors in size; errors in copying each design were subtracted from the corresponding recall trial errors to obtain a memory score. In the few instances where the copying produced more errors than the recall trial, a subject was given zero errors for that trial.
The BVRT’s from the Knoxville sample were scored independently for errors by the investigator and by a psychology intern who was trained in neuropsychological assessment. An inter-rater agreement level of .96 was obtained, so the second rater was not used for the Hines sample.

The Rev Auditory-Verbal Learning Test (AVLT) (Lezak, 1976) is an easily administered test of immediate memory span. A 15-word list was read aloud by the examiner, at the rate of one word per second, for five consecutive trials. Each trial was followed by a recall test. A second 15-item list was presented for the sixth trial, followed by recall, and the subject then was asked to recall words from the first list without presentation of the words. A recognition trial was given after these seven trials, and required the subject to indicate which words in a story read by the examiner were on the original list.

The subject received a score for total recall on trials one through five, a delayed recall for trial seven, and a total for recognition. (See Appendix E for the recording forms). The AVLT was selected because it is a test of verbal memory that elicits a learning curve somewhat similar to that provided by the Fuld Test, but without the interfering tasks. The AVLT has been used successfully with elderly patients in a Veterans Administration Medical Center (Query & Berger, 1980; Query & Megran, 1983).
The Demographic Information Sheet was used to obtain data regarding age, educational level, self-perceived health, and estimation of memory problems. Diagnoses were recorded from patients' charts. (See Appendix F for the form).

Procedure

Potential subjects were identified by the head nurse or clinical psychologist serving the Geriatric Psychiatry and Nursing Home Care Units, on the basis of the inclusion criteria (see Appendix G). Thus, potential subjects were those male veterans over age 60 who were free of gross disabilities (e.g. perceptual-motor deficits, aphasia, extreme visual or auditory impairments) that would impede their performance on the test battery. They had been judged likely to tolerate a one-hour testing session without ill effects and they were not actively psychotic or potentially violent. Potential subjects were approached individually by the investigator, and information about the research (including the identity and institutional affiliation of the experimenter, the general nature of the research, and the nature of the tasks the participants would be asked to do) was given to them both orally (see Appendix H) and in written form (see Appendix I). It was explained that participation in the research was optional, any information given would be confidential, they could withdraw from the research
at any time, and their questions about the research would be answered. Their written consent was obtained.

The tests were administered in the following order: Quick Test, Fuld Test, Short D, SDS, Fuld delayed recall trial, BVRT, AVLT, and the demographic data sheet. Although test order often is counterbalanced, this design was chosen instead for several reasons. The Quick Test was specifically recommended as an "icebreaker" in a test battery (Ammons & Ammons, 1962), so it was administered first. The Fuld Test was given second because the subject was to be tested for delayed recall afterward. The Short D and SDS were inserted between the Fuld Test and its delayed recall trial because they were most likely to provide the most stable short interval, desirable for consistency's sake. The BVRT was next because its stimuli were least similar to the Fuld, which was intended to reduce confusion in the subjects. The AVLT was least proximate to the Fuld trials. The demographic information sheet was completed last and provided an opportunity for the subject to ask questions or make comments.

The test battery was designed to be completed in a one hour period, but due to factors such as deliberateness, talkativeness, and slowness, subjects often took longer. Because of this, fatigue and scheduling conflicts arose occasionally. Therefore, eight subjects chose to stop after
the Fuld delayed recall trial and continue at a later time. In all cases, the battery was completed within a week.

Statistical Analyses

Data collection in the present investigation yielded the following: 1) three measures of depression, from the Fuld Test, Short D, and Zung SDS; 2) a measure of intelligence, from the Quick Test; and 3) various measures of memory from the Fuld Test, AVLT, and BVRT. Evaluation of concurrent validity involved determination of the relationship between the Fuld Test and the corresponding measures of memory, depression, and intelligence. Because of the large number of comparisons possible between these scores, and the corresponding increase in the chance of obtaining spurious results, the primary hypotheses were limited to four. (See page 24). The measure of variance accounted for, $r^2$, was reported for each significant relationship. Pearson product moment correlations were computed to test hypotheses one through four. Fisher’s $r$ to $z$ transformation (Hays, 1973) was computed to determine if there were significant differences in these four correlations between the two samples. The samples would be aggregated if there were no significant differences.
CHAPTER IV
RESULTS

Results of the data analysis will be presented in three parts. In the first section, descriptive data on the samples will be presented. In the second section, results of the correlational analyses concerning Hypotheses one through four will be reported. In the final section, results of selected post hoc analyses will be presented.

Descriptive Statistics

Table 1 presents the number of cases, means, and standard deviations of the demographic data (age, years of schooling, self-rated health, and self-rated memory problems) from subjects at each Veterans Administration Medical Center. It also lists the means and standard deviations of the instruments used in the study (i.e., Quick Test, Short Depression Scale, Zung Self-Rating Depression Scale, Fuld total recall across five trials, recall on Rey's Auditory Verbal Learning Test across five trials, the total number of memory errors on the Benton Visual Retention Test, and the number of names, foods, and vegetables rapidly recalled on the Fuld Test). None of the t-tests of these variables between the two samples was significant at p<.05.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Knoxville V.A.</th>
<th>Hines V.A.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X</td>
<td>s.d.</td>
</tr>
<tr>
<td>Age</td>
<td>66.80</td>
<td>5.52</td>
</tr>
<tr>
<td>School</td>
<td>10.90</td>
<td>2.56</td>
</tr>
<tr>
<td>Self-Rated Health (1=poor, 4=excellent)</td>
<td>2.57</td>
<td>.94</td>
</tr>
<tr>
<td>Self-Rated Memory Problems (1=never, 5=always)</td>
<td>2.67</td>
<td>1.37</td>
</tr>
<tr>
<td>Quick Test</td>
<td>106.50</td>
<td>14.13</td>
</tr>
<tr>
<td>Short D</td>
<td>5.23</td>
<td>3.16</td>
</tr>
<tr>
<td>SDS Index (Zung)</td>
<td>50.47</td>
<td>12.78</td>
</tr>
<tr>
<td>Fuld Total Recall</td>
<td>28.17</td>
<td>13.28</td>
</tr>
<tr>
<td>AVLT Total</td>
<td>25.40</td>
<td>10.65</td>
</tr>
<tr>
<td>BVRT Total</td>
<td>6.18</td>
<td>3.83</td>
</tr>
<tr>
<td>Fuld Rapid Recall</td>
<td>29.37</td>
<td>12.30</td>
</tr>
</tbody>
</table>
Descriptive data from the aggregate sample are contained in Table 2.

Because this appears to be the first research using the Fuld Test with an inpatient veteran population, some comparisons might be made to the male populations studied by Fuld (1977). She reported a total recall mean on the Fuld Test of 38.73 (s.d. 4.53) for 70-79 year old subjects residing in the community, and a mean of 29.60 (s.d. 7.93) for 70-79 year old subjects in nursing homes. The aggregated sample of veterans, by contrast, had a mean of 30.13 (s.d. 11.52). Thus the Fuld total recall scores of the veterans appear similar to the scores obtained by Fuld’s nursing home sample.

Table 3 presents information on the medical diagnoses of subjects in each sample. It should be noted that the veterans frequently had more than one diagnosis (X=2.03, s.d.=1.24). Of the 30 veterans in the Knoxville sample, 28 had some type of psychiatric diagnosis such as schizophrenia, depression, or psychotic organic brain syndrome. Only three of the 28 veterans from Hines had a psychiatric diagnosis; instead, they tended to be rehabilitation patients.

Correlational Analyses

As a procedural check, the relationship of the Fuld total recall score to the intelligence score obtained on the Quick Test was examined. A product-moment correlation of
## Table 2
Descriptive Data From the Aggregated Sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>X</th>
<th>s.d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>68.76</td>
<td>8.41</td>
</tr>
<tr>
<td>School</td>
<td>11.17</td>
<td>2.53</td>
</tr>
<tr>
<td>Self-Rated Health (1=poor, 4=excellent)</td>
<td>2.36</td>
<td>.93</td>
</tr>
<tr>
<td>Self-Rated Memory Problems (1=never, 5=always)</td>
<td>2.84</td>
<td>1.45</td>
</tr>
<tr>
<td>Quick Test</td>
<td>105.69</td>
<td>12.97</td>
</tr>
<tr>
<td>Short D</td>
<td>5.50</td>
<td>3.18</td>
</tr>
<tr>
<td>SDS Index (Zung)</td>
<td>49.93</td>
<td>12.26</td>
</tr>
<tr>
<td>Fuld Total Recall</td>
<td>30.14</td>
<td>11.52</td>
</tr>
<tr>
<td>AVLT Total</td>
<td>27.66</td>
<td>10.64</td>
</tr>
<tr>
<td>BVRT Total Memory Errors</td>
<td>5.91</td>
<td>3.30</td>
</tr>
<tr>
<td>Fuld Rapid Recall</td>
<td>30.10</td>
<td>10.40</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>Total N=30</td>
<td>Total N=28</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>------------</td>
<td>------------</td>
</tr>
<tr>
<td>Primarily physical problem</td>
<td>2</td>
<td>25</td>
</tr>
<tr>
<td>Primarily psychiatric problem</td>
<td>28</td>
<td>3</td>
</tr>
<tr>
<td>Depression</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Alcohol abuse and/or alcohol deterioration</td>
<td>14</td>
<td>5</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>Hypertension</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>Dementia/OBS</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>CVA</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Brain injury (e.g., lobotomy)</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>COPD (lung disease)</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>ASHD (heart disease)</td>
<td>6</td>
<td>11</td>
</tr>
<tr>
<td>Schizophrenia</td>
<td>10</td>
<td>0</td>
</tr>
</tbody>
</table>
.244 (p < .06) did not reach the .05 level of significance. In contrast, the relationship between the Quick Test and the BVRT, $r = -.265$, and the relationship between the Quick Test and the AVLT, $r = -.396$, did attain statistical significance at the .05 level. A formula developed by Williams (1959) was used to test the difference between these dependent correlations. The Quick Test was more highly correlated with the AVLT ($t = 1.687, df = 55$) than with the Fuld total recall score. Correlations of the Quick Test with the BVRT and with the Fuld test did not differ significantly ($t = .133$, $df = 52$). Because scores on the AVLT and BVRT were significantly correlated with scores on the Quick Test, and the Fuld total recall score nearly correlated significantly with the Quick Test score as well, intelligence was partialled from the correlations between the memory tests.

Pearson product moment correlations were computed for each sample to test hypotheses one through four. As noted above, results of the Quick Test were partialled from the relationships between the Fuld total recall and both the AVLT and BVRT, to control for level of intelligence (Hays, 1973). Then, to see if there were significant differences in these four hypothesized correlations between the samples, Fisher's $r$ to $z$ transformations were computed for each pair of correlations. Results of these analyses are presented in Table 4. None of the $z$-tests was significant, so data from the two samples were aggregated for further analyses.
Table 4
Pearson Product-moment Correlations of
Hypothesized Relationships in the Two Samples

<table>
<thead>
<tr>
<th></th>
<th>Knoxville</th>
<th>Hines</th>
<th>z-test based on Fisher’s r to z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuld total recall with AVLT total recall, partialling intelligence</td>
<td>0.750</td>
<td>0.670</td>
<td>0.584</td>
</tr>
<tr>
<td>Fuld total recall with number of memory errors on the BVRT, partialling intelligence</td>
<td>-0.083</td>
<td>-0.421</td>
<td>1.279</td>
</tr>
<tr>
<td>Fuld depression score with Zung SDS score</td>
<td>0.054</td>
<td>0.055</td>
<td>-0.004</td>
</tr>
<tr>
<td>Fuld depression score with Short D depression score</td>
<td>0.280</td>
<td>-0.031</td>
<td>1.146</td>
</tr>
</tbody>
</table>

All tabled z-test values are nonsignificant at the .05 level.
The results of testing Hypotheses one through four are presented in Table 5. Hypothesis one predicted a positive relationship between total recall on the Fuld Test and total recall on the Auditory Verbal Learning Test. After partialling out the effect of intelligence, the observed product-moment coefficient of .715 supported Hypothesis one. The r^2 value (the coefficient of determination) was .51 which indicated that the two tests had 51% of their variance in common.

Hypothesis two predicted that total recall on the Fuld Test would be inversely related to the number of errors on the Benton Visual Retention Test. After partialling out the effect of intelligence, a correlation coefficient of -.247 was in the hypothesized direction, but did not reach the .05 level of significance, and Hypothesis two was therefore not supported. In Table 6, the intercorrelation matrix for selected memory variables is displayed. It can be seen that the Fuld total recall score remains significantly correlated with the Fuld rapid recall trial, AVLT recall, and BVRT memory scores, when the effect of intelligence is not removed.

Hypotheses three and four concerned the relationship of the Fuld depression measure to two established measures of depression. The correlation matrix of the depression variables is displayed in Table 7, including the subscales of the Zung SDS. Hypothesis three predicted that the level of
Table 5
Pearson Product-Moment Correlations of Hypothesized Relationships in the Aggregated Sample

<table>
<thead>
<tr>
<th>Variables</th>
<th>r</th>
<th>N</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuld total recall - AVLT total recall, partialling Quick</td>
<td>.715</td>
<td>58</td>
<td>.000</td>
</tr>
<tr>
<td>Fuld total recall - BVRT memory errors, partialling Quick</td>
<td>-.247</td>
<td>55</td>
<td>.07</td>
</tr>
<tr>
<td>Fuld depression score - Zung SDS score</td>
<td>.051</td>
<td>58</td>
<td>.70</td>
</tr>
<tr>
<td>Fuld depression score - Short D depression score</td>
<td>.162</td>
<td>58</td>
<td>.22</td>
</tr>
</tbody>
</table>
Table 6
Intercorrelation Matrix for Selected Memory Variables

<table>
<thead>
<tr>
<th></th>
<th>Fuld Total Recall</th>
<th>Fuld Rapid Trials</th>
<th>AVLT Total Recall</th>
<th>BVRT Memory Errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuld Total Recall</td>
<td>1.00</td>
<td>0.60**</td>
<td>0.73**</td>
<td>-0.37*</td>
</tr>
<tr>
<td>Fuld Rapid Trials</td>
<td>1.00</td>
<td>0.75**</td>
<td>-0.42*</td>
<td></td>
</tr>
<tr>
<td>AVLT Total Recall</td>
<td></td>
<td>1.00</td>
<td></td>
<td>-0.37*</td>
</tr>
<tr>
<td>BVRT Memory Errors</td>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
</tr>
</tbody>
</table>

*=p<.01, **=p<.0001
Table 7
Intercorrelation Matrix for Depression Variables

<table>
<thead>
<tr>
<th></th>
<th>Fuld Depr</th>
<th>Short D</th>
<th>Zung</th>
<th>Z1</th>
<th>Z2</th>
<th>Z3</th>
<th>Z4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuld Depr</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short D</td>
<td>1.00</td>
<td>.63</td>
<td>.59</td>
<td>.36</td>
<td>.44</td>
<td>.60</td>
<td></td>
</tr>
<tr>
<td>Zung Index</td>
<td>1.00</td>
<td></td>
<td>.65</td>
<td>.75</td>
<td>.68</td>
<td>.91</td>
<td></td>
</tr>
<tr>
<td>Z1 Affective</td>
<td>1.00</td>
<td></td>
<td>.30</td>
<td>.36</td>
<td>.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Z2 Physiological</td>
<td>1.00</td>
<td></td>
<td>.43</td>
<td>.48</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Z3 Psychomotor</td>
<td></td>
<td></td>
<td>1.00</td>
<td>.53</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Z4 Psychological</td>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ns = correlation < .01
depression on the Fuld Test would be related positively to the Zung Self-Rating Depression Scale score. The observed product-moment correlation of .051 was not significant. Similarly, a nonsignificant product moment correlation of .162 was obtained between the level of depression on the Fuld Test and the Short D depression score. Thus, hypotheses three and four were not supported.

Post Hoc Analyses

Although the primary hypotheses were limited to four, several post hoc analyses were performed. A series of t-tests was done to determine if there was a significant relationship between diagnosis of depression and scores on the memory and depression tests. Subjects with a charted diagnosis of depression (N=9) were compared to subjects with no diagnosis of depression on the dependent variables of Fuld total recall, AVLT total recall, Benton memory errors, the Quick Test, Short D, and Zung SDS. The only significant relationship was found on the Short D. The depressed veterans' mean of 7.78 was greater than the nondepressed veterans' mean of 5.08 (p < .02).

Similar post hoc t-test analyses were conducted to determine if veterans with diagnoses of dementia (N=14) differed on the tested variables from those veterans without a diagnosis of dementia (N=44). Demented veterans scored significantly lower (X=22.2) than nondemented veterans (X=32.6) on the Fuld total recall score and on the AVLT
total recall score ($X=20.4$ and $X=30.0$ for the demented and nondemented, respectively). However, the t-tests for the demented versus nondemented participants’ memory errors on the BVRT, the intelligence score on the Quick Test, and depression scores on the Short D and Zung SDS were not significant.

As another post hoc test, the relationship between the depression and memory variables was examined, using a canonical correlation procedure. The first set of variables consisted of memory scores, including the Fuld total recall score, the AVLT total score, and the number of memory errors on the BVRT. The second set of variables consisted of the depression scores, including the Zung SDS score and the Short D score. Fuld depression scores were not included in the analysis because Hypotheses three and four had not been supported.

For the canonical correlation, memory data were the predictor variables and depression data were the criterion variables. The canonical analysis derived a correlation between a linear function of the memory variables with a linear function of the depression variables and tested the significance in an F-statistic analysis. The resulting canonical variate of .386 had an F statistic of 1.40 with 6 df, $p (F) = .22$. Therefore the overall correlation between the two sets of variables was insignificant. Because of the overall insignificance, results of the correlations between
individual memory and depression tests (see Table 8) must be viewed with caution. It can be seen that both the Fuld total recall and the AVLT total recall are modestly positively correlated with scores on the Short D, the Fuld rapid recall score is modestly negatively correlated with the Fuld depression measure, and the BVRT memory scores are not significantly related to any of the depression measures.

Summary

In summary, the Fuld total recall was not related significantly to the intelligence score obtained on the Quick Test. By contrast, both the AVLT and BVRT were related significantly to the Quick Test score. The Fuld total recall was highly correlated with the score on the test of verbal memory, the Auditory Verbal Learning Test (AVLT), but not with the score on the test of visual memory, the Benton Visual Retention Test (BVRT).

Although the memory component of the Fuld Object-Memory Evaluation bore a strong relationship to a test of verbal memory, the depression component of the Fuld had strikingly small correlational relationship with both other depression measures used, the Zung Self-Rating Depression Scale (SDS) and a shortened form of the MMPI depression scale (Short D). In the post hoc analyses, veterans diagnosed as depressed had higher scores on the Short D than nondepressed subjects, but showed no differences on the other primary measures. Veterans with a diagnosis of dementia scored significantly
Table 8
Intercorrelation Matrix for Depression and Memory Variables

<table>
<thead>
<tr>
<th></th>
<th>Fuld Depression</th>
<th>Short D</th>
<th>Zung SDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuld Total Recall</td>
<td>-.07</td>
<td>.27*</td>
<td>-.03</td>
</tr>
<tr>
<td>Fuld Rapid Trials Total</td>
<td>-.32*</td>
<td>.23</td>
<td>.03</td>
</tr>
<tr>
<td>AVLT Total Recall</td>
<td>-.13</td>
<td>.30*</td>
<td>-.03</td>
</tr>
<tr>
<td>BVRT Memory Errors</td>
<td>.12</td>
<td>.04</td>
<td>.01</td>
</tr>
</tbody>
</table>

*p<.05
lower on the Fuld total recall and AVLT total recall, but their diagnosis did not appear to affect their depression scores. In the post hoc canonical analysis, no significant relationships were found between the set of memory variables and the set of depression variables.
CHAPTER V
DISCUSSION AND SUMMARY

The purpose of this research was to examine the concurrent validity of the depression and memory components of the Fuld Object-Memory Evaluation in a Veterans Administration Medical Center inpatient setting. The discussion will be divided into three parts: Discussion of the hypotheses, limitations of the instruments and design, and suggestions for further research.

Discussion of the Hypotheses

In general, it was discovered in the present research that the memory component of the Fuld Object-Memory Evaluation was correlated with other measures of memory but that the depression component was not correlated with other measures of depression. A discussion of the procedural check and specific hypotheses follows.

In the procedural check, no significant correlation was found between the Fuld total recall score and the estimated IQ on the Quick Test, $r = .244, p(.06)$ suggesting that the Fuld recall task may provide a measure of memory which is less contaminated by the effect of intelligence than either the BVRT or AVLT. The reason for the apparent superiority
of the Fuld over the other two tests in this regard is unclear. Perhaps the concreteness of the stimuli required less abstract ability to do well on this task than recalling a list of verbally presented words or geometric figures presented visually.

The level of total recall on the Fuld Object-Memory Evaluation was related positively to the total recall on the Auditory Verbal Learning Test, after the effects of intelligence had been partialled out ($r = .715$). This high correlation might have been expected because each test required subjects to learn lists, of ten items and fifteen words in the Fuld Test and AVLT, respectively. Yet subjects in both samples averaged a higher recall score across five trials on the Fuld than on the AVLT, despite the AVLT having 15 items and the Fuld having only ten items per trial. Perhaps this could be attributed to the difference in stimuli presentation; the Fuld procedure requires identification of the items by touch and then sight, which assures that the subject has attended to the items, whereas the AVLT is strictly a verbal recall test. Another explanation is that most subjects may be able to recall only ten or fewer items regardless of presentation method. A third possibility is that the subjects may have tired toward the end of the session, resulting in poorer performance on the AVLT compared to the Fuld Test.
The level of total recall on the Fuld Test was not inversely related to the number of errors on the Benton Visual Retention Test, after the effects of intelligence were partialled out. The correlation of -.247 obtained in the research did not reach the .05 level of significance. There may be several reasons why this hypothesized relationship was not found. The low correlation of the BVRT with the Fuld may be attributable to the way in which the BVRT measures memory, since the correlation of the BVRT memory score with the AVLT recall score also was low. Another possible explanation involves the nature of the samples. Research has shown that schizophrenics show deficits on the Benton compared to normal controls (Golden, 1979). The correlation between the Fuld and BVRT in the Hines sample was much higher than in the Knoxville sample, the latter including a large number of schizophrenics. Finally, the scoring system of the BVRT is designed primarily to determine the presence of various neuropsychological disorders (Moses, 1983) and the adaptation of the scoring system for purposes of memory measurement may have been quantitatively or qualitatively inappropriate.

Examination of the intercorrelation matrix of the memory variables reveals that the task requiring rapid recall from categories was closely related to both the Fuld total recall score across five trials \( r = .60 \) and the AVLT total recall \( r = .75 \). This high correlation provides
indirect support for Drachman and Leavitt's (1972) assertion that the task is a good measure of retrieval. This rapid recall task might have screening potential alone as well as when used in the Fuld Test.

This research did not find the Fuld to be a measure of depression. The correlations of the Fuld depression measure with the Zung SDS and Short D tests were nonsignificant and both the Zung SDS and Short D have established validity in the measurement of depression. In addition, post hoc analysis revealed that the Fuld measure also had little relationship to the participants' diagnosis of depression. The Fuld measure of depression did correlate -.32 (p<.02) with the total items named on the three rapid recall trials of the Fuld. This suggests that the Fuld measure may be related to fluency. Most subjects were able to name only a few sad items, but the more fluent subjects tended to name many items that make people happy, thus obtaining a low depression score when the number of happy items was subtracted from the number of sad items.

In the post hoc analysis, the canonical correlation between the sets of memory and depression variables in the test battery was not significant. This result may not be surprising, because previous studies ordinarily analyzed the memory performance of people diagnosed clinically depressed or nondepressed. In the present study, on the other hand, of
the participants assessed for depressive symptomatology on several paper-and-pencil measures, only a few had a diagnosis of depression. It might be expected, statistically, that since most of the participants were not clinically depressed, their depression scores would fall within the normal range, and lesser correlations would be found with other measures.

**Limitations of the Instruments and Design**

A number of limitations in this research should be noted. First, the samples are relatively small and reflect certain biases. For instance, veterans in the Knoxville sample tended to be longer-term psychiatric patients and veterans in the Hines sample were shorter-term patients in a rehabilitation-oriented setting. Because the hypothesized correlations were statistically similar in the two diverse settings, it suggests these relationships may be more reliable than might otherwise be assumed. However, the samples were biased in favor of the "cooperators," those veterans who were willing to participate in the study. Approximately 13 of those approached refused to participate, and the effect this participation rate had on the results obtained is difficult to estimate. Also, a number of variables were not controlled in the present study, such as length of hospitalization, type of medications, and degree of organic impairment.
A second set of limitations center around the instruments and how they were used. A number of the subjects appeared to have difficulty determining their choices from the four-point scale of the Zung SDS. They tended to get confused at the negatively worded items of the Short D (e.g. "I do not worry about catching diseases"). A new geriatric scale for the rating of depression (Brink, Yesavage, Lum, Heerema, Adey, & Rose, 1982; Yesavage, Brink, Rose, Lum, Huang, Adey, & Leirer, 1983) uses a yes-no format with clearly worded questions, and research suggests that it has greater sensitivity than other depression scales. The Benton Visual Retention Test appeared to be the most difficult for the veterans and may have unfairly discriminated against those with right-hemisphere strokes, visual defects, or motor control difficulties.

The question could be asked, "Why was not the Fuld depression measure correlated with scores on the Zung SDS and Short D?" At the suggestion of the test's author (Fuld, Note 2) the interval of recall for "things that make you happy" and "things that make you sad" was lengthened from 30 seconds to one minute. However, it seems unlikely that this alteration alone affected the relationship so drastically. Fuld (1977) had reported that every person who named more sad than happy items had a diagnosis of depression, but in the current research, this relationship was not supported. Only seven of the 29 subjects scoring in the depressed range
On the Zung (score > 50) obtained a higher sad than happy score, and three nondepressed subjects obtained higher sad scores. Thus, of the 29 subjects classified as depressed on the Zung SDS, 22 would have been missed by the Fuld criterion and three would have been falsely identified as depressed.

Several factors might influence this disparity in Fuld's results compared to the present study. Fuld (1977) reports few males in her sample, and she also pre-screened participants using an adaptation of Blessed, Tomlinson, and Roth's (1968) "mental test" to eliminate those with mental impairment. The age range of the veterans was more varied; Fuld only reported norms for persons aged 70 to 79 and 80 to 89 residing in the community and in nursing homes. The veterans ranged from 59 to 94 years old. Perhaps the psychiatric nature of Knoxville's population also contributed to the greater variance in their results.

Future Research Directions

Any study that relies heavily on paper-and-pencil measures is open to the criticism that other domains of assessment were not used. Yet such behavioral or operational measures of memory are scarce. Baddeley, Sunderland, and Harris (1982) recommend that subjective ratings be obtained from a close relative about the patient's everyday memory failures, because these ratings were correlated much more closely with actual memory performance than were the patient's own ratings in a memory diary.
Perhaps the next step in memory research is to explore the relationship between behavioral measures, ratings by staff or relatives, and objective neuropsychological tests. It would appear useful, for example, to determine what degree of impairment on the Fuld Test suggests the need for supervised living arrangements, or how well a staffperson's ratings predict a person's performance on the Fuld Test. Triangulation with other types of measures could reduce the impact of measurement factors and perhaps increase the predictive value of the test.

Another area of potential research centers on the acceptability of the tests for the subjects. Anecdotal evidence suggests the Fuld may be tolerated by the subjects better than tests such as the AVLT and BVRT. The Fuld has characteristics of a game and the stimuli are concrete and easily understood. It was not uncommon to have subjects approach the experimenter days later and attempt to recall the Fuld items, although they never did this with the AVLT or BVRT items. The subjects appeared to find recall of the AVLT word list more tedious and many appeared frustrated in their efforts to complete the BVRT items correctly. Future research might also investigate the reliability and validity of Form 2 of the Fuld, as it has received little attention in the memory literature to date. Finally, the performance of veterans in the community could be compared to that of
veterans in medical or psychiatric facilities, or in the geriatric population at large.

Although the results of the Fuld depression measure in the current study were not encouraging, future research might investigate if the 30-second trials used by Fuld (1977) produce better results than the modified 60-second trials. Research on the Fuld depression measure also might be investigated in a larger population of clinically depressed subjects. In short, the Fuld Object-Memory Evaluation appears to offer many avenues for future research on both its memory and depression components.
REFERENCE NOTES


2. Fuld, P. Personal communication, October 20, 1982.

REFERENCES


Cauthen, N. R. Extension of the Wechsler Memory Scale norms to older age groups. *Journal of Clinical Psychology*, 1977, 33, 208-211.


Lishman, W. A. Selective factors in memory. Part I: Age, sex, and personality attributes. Psychological Medicine, 1972, 2, 121-138. (a)

Lishman, W. A. Selective factors in memory. Part II: Affective disorder. Psychological Medicine, 1972, 2, 248-253. (b)

Lishman, W. A. The speed of recall of pleasant and unpleasant experiences (preliminary communication). Psychological Medicine, 1974, 4, 212-218.


APPENDIX A

The Quick Test Items
<table>
<thead>
<tr>
<th>Sheet (easy)</th>
<th>Loser (7)</th>
<th>Doleful (18)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise (easy)</td>
<td>Heartbreak (8)</td>
<td>Times (18+)</td>
</tr>
<tr>
<td>Machine (easy)</td>
<td>Struggle (9)</td>
<td>Disconsolate (18+)</td>
</tr>
<tr>
<td>Burners (easy)</td>
<td>Rotary (10)</td>
<td>Sustenance (18+)</td>
</tr>
<tr>
<td>Audience (easy)</td>
<td>Opponents (9)</td>
<td>Maudlin (hard)</td>
</tr>
<tr>
<td>__________5</td>
<td>__________25</td>
<td>__________45</td>
</tr>
<tr>
<td>Dish (easy)</td>
<td>Grief (10)</td>
<td>Gustatory (hard)</td>
</tr>
<tr>
<td>Drying (easy)</td>
<td>Utensils (11)</td>
<td>Poignant (hard)</td>
</tr>
<tr>
<td>Food (easy)</td>
<td>Lever (11)</td>
<td>Belligerent (hard)</td>
</tr>
<tr>
<td>Fork (easy)</td>
<td>Portion (12)</td>
<td>Comestible (hard)</td>
</tr>
<tr>
<td>Crowd (easy)</td>
<td>Edible (12)</td>
<td>Despondency (hard)</td>
</tr>
<tr>
<td>__________10</td>
<td>__________30</td>
<td>__________50</td>
</tr>
<tr>
<td>Slice (easy)</td>
<td>Exhibition (13)</td>
<td></td>
</tr>
<tr>
<td>Washing (easy)</td>
<td>Soothed (13)</td>
<td></td>
</tr>
<tr>
<td>Tears (easy)</td>
<td>Caress (14)</td>
<td></td>
</tr>
<tr>
<td>Fighting (easy)</td>
<td>Combatant (14)</td>
<td></td>
</tr>
<tr>
<td>Kitchen (easy)</td>
<td>Forlorn (15)</td>
<td></td>
</tr>
<tr>
<td>__________15</td>
<td>__________35</td>
<td></td>
</tr>
<tr>
<td>Tasty (easy)</td>
<td>Nutrient (15)</td>
<td></td>
</tr>
<tr>
<td>Windy (6)</td>
<td>Solace (16)</td>
<td></td>
</tr>
<tr>
<td>Pitiful (6)</td>
<td>Pacify (16)</td>
<td></td>
</tr>
<tr>
<td>Contest (7)</td>
<td>Contorted (17)</td>
<td></td>
</tr>
<tr>
<td>Sorrow (8)</td>
<td>Jets (17)</td>
<td></td>
</tr>
<tr>
<td>__________20</td>
<td>__________40</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX B

Zung Self-Rating Depression Scale Items
1. I feel down-hearted, blue and sad.
2. Morning is when I feel the best.
3. I have crying spells or feel like it.
4. I have trouble sleeping through the night.
5. I eat as much as I used to.
6. I enjoy looking at, talking to and being with attractive women/men.
7. I notice that I am losing weight.
8. I have trouble with constipation.
9. My heart beats faster than usual.
10. I get tired for no reason.
11. My mind is as clear as it used to be.
12. I find it easy to do the things I used to.
13. I am restless and can't keep still.
15. I find it easy to make decisions.
16. I feel that I am useful and needed.
17. My life is pretty full.
18. I feel that others would be better off if I were dead.
19. I still enjoy the things I used to do.
APPENDIX C

Fuld Object-Memory Evaluation Items
<table>
<thead>
<tr>
<th>Fuld Item</th>
<th>Choices Given on Recall Trials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ball</td>
<td>stone, block, ball</td>
</tr>
<tr>
<td>Bottle</td>
<td>light bulb, bottle, box</td>
</tr>
<tr>
<td>Button</td>
<td>coin, buckle, button</td>
</tr>
<tr>
<td>Card</td>
<td>photograph, card, stamp</td>
</tr>
<tr>
<td>Cup</td>
<td>spoon, saucer, cup</td>
</tr>
<tr>
<td>Key</td>
<td>key, can opener, nail file</td>
</tr>
<tr>
<td>Matches</td>
<td>lighter, toothpick, matches</td>
</tr>
<tr>
<td>Nail</td>
<td>nail, screw, pencil</td>
</tr>
<tr>
<td>Ring</td>
<td>bracelet, ring, thimble</td>
</tr>
<tr>
<td>Scissors</td>
<td>scissors, knife, pliers</td>
</tr>
</tbody>
</table>
APPENDIX D

Short Depression Scale from the MMPI (Short D)
Short D Items

T F  8. My daily life is full of things that keep me interested.
T F  51. I am in just as good physical health as most of my friends.
T F  88. I usually feel that life is worth while.
T F  242. I believe I am no more nervous than most others.
T F  107. I am happy most of the time.
T F  272. At times I am all full of energy.
T F  122. I seem to be about as capable and smart as most others around me.
T F  207. I enjoy many different kinds of play and recreation.
T F   18. I am very seldom troubled by constipation.
T F  248. Sometimes without any reason or even when things are going wrong, I feel excitedly happy, "on top of the world".
T F  131. I do not worry about catching diseases.
T F   57. I am a good mixer.
T F  130. I have never vomited blood or coughed up blood.
T F   46. My judgment is better than it ever was.
T F   36. I seldom worry about my health.

The number refers to the item number on the MMPI, Form R. For a total depression score, all F responses are counted except the T response for number 130.
APPENDIX E

Rey Auditory-Verbal Learning Test Recording Form
Rey Auditory Verbal Learning Test (AVLT)

<table>
<thead>
<tr>
<th>LIST A</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>LIST B</th>
<th>I</th>
<th>VI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Desk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curtain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Ranger</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bell</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bird</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coffee</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Shoe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>School</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Store</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parent</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Mountain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moon</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Glasses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garden</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Towel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Cloud</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farmer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Boat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lamb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turkey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Gun</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Pencil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>House</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Church</td>
<td></td>
<td></td>
</tr>
<tr>
<td>River</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Fish</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total
Recalled
APPENDIX F

Demographic Information Sheet
Demographic Information Sheet

Present age _____

Would you say that, in general, your health is

___ excellent
___ good
___ fair
___ poor

How much schooling did you finish?
___ years

How often do you have trouble with your memory?
___ very often or always
___ often
___ sometimes
___ seldom
___ very seldom or never

Primary diagnoses ________________________________
APPENDIX G

Inclusion Criteria for Subject Selection
Inclusion Criteria for Subject Selection

Subjects must be:

Male veterans at least 60 years of age
Free of gross signs of receptive or expressive aphasia
Free of gross perceptual-motor deficits
Likely to tolerate a one-hour testing session without ill effects
Not actively psychotic or potentially violent
Able to see simple geometric figures one-fourth inch and larger, with or without the aid of glasses
Able to hear speech of normal to loud volume
Legally able to sign a research consent form
APPENDIX H

Summary of Oral Presentation to Subjects
Summary of Oral Presentation to Subjects

My name is Mary Eggert. I am a graduate student at Ohio State University and also work here as a Psychology Intern. I am conducting a research project and would like your help with it. The purpose of the project is to try out a new test and see how well it works with people here at the hospital. If you are willing to participate in this research, you will be asked to perform four types of tasks and to answer some questions about your mood. One task involves selecting a picture closest in meaning to some vocabulary words. The other three tasks involve learning a set of words, objects, and designs. You will get several chances to learn them. This should not take longer than one hour of your time. All the information you would give is confidential; your data will be identified only through numerical code. You do not have to participate in this research. If you do decide to volunteer and later decide that you would rather not, you can end your participation at any time. Would you be willing to help me with this project?
APPENDIX I

Written "Information About" Sheet
Information about "Validation of the Fuld Object-Memory Evaluation," by Joseph Graca and Mary Eggert of the Knoxville V.A. Medical Center

The purpose of this study is to validate the use of the Fuld Object-Memory Evaluation in assessing geriatric patients in a V.A. Hospital setting. If you agree to participate in this study, you will be asked to perform four types of tasks and to answer some questions about your mood. One task involves selecting a picture closest in meaning to some vocabulary words. The other three tasks involve learning a set of words, objects, and designs. Afterward you will be asked to say those you remember. You will be given several chances to learn them. This session will take approximately one hour of your time. There are no apparent risks.

There will be no monetary payment for participation in this study. The benefit you will receive will be knowing you have contributed to the existing knowledge in this area. You may also receive feedback about your performance if you so desire, and will be given the chance to ask questions about the study.

All information gathered in this study will remain anonymous. The only way your data will be identified is through numerical code. Furthermore, your identity as a participant will not be revealed in any published or oral presentation of the results of this study.

You do not have to participate in this study if you don’t want to. A decision not to participate in the study will not affect your right to receive health care or any benefit to which you are entitled. If you decide to volunteer to participate and later decide that you would rather not, you can end your participation at any time.

In the unlikely event you are injured as a result of participation in this study, the Knoxville Veterans Administration Medical Center will furnish medical care as provided by Federal statute. Compensation for such injury may be available to you under provisions of Title 38, United States Code, Section 351, and/or Federal Tort Claims Act. For further information, contact the V.A. District Legal Counsel, William O’Keefe, at FTS 862-4090.

Do you have any questions at this point? If some questions do arise later, feel free to contact Mary Eggert (515-842-3101 x316) or Joseph Graca (x 421) here at the hospital.
(Subject) I, ______________, certify that the above written summary was discussed and explained fully to me by ______ on this date.  (signed and dated)

(Witness) I, ______________, certify that I was present during the oral presentation of the above written summary when it was given to the above subject.  (signed and dated)

(Investigator) I have discussed the above points with the subject. It is my opinion that the subject understands the risks, benefits and obligations involved in participation in this study.  (signed and dated)