

5. Quality Control

a. Test Administration and Scoring

- (1) Quality control will be achieved in several ways. Details for achieving reliability in administration and scoring of specific tests are provided below. Group meetings will be conducted every Monday to address issues of standardization and development of consistent responses to problems that occur. A log of the proceedings of these meetings will be kept. In addition, CDC personnel impersonating veterans will be periodically sent through the entire testing procedure to ensure quality control. Further, CDC will statistically compare results across technicians, noting any inconsistencies. The chief neuropsychologist will be notified by CDC of any problems noted. Any issue regarding standardization of administration or scoring will be discussed with CDC before changes are initiated.
- (2) To eliminate bias on the tester's part during scoring of the tests, each participant's cohort membership will be unknown to the tester during the testing sessions. If for some reason during the neuropsychological testing session the tester is made aware of which cohort the participant is in, that tester will continue to administer the tests but will discontinue scoring of those tests for that individual. A note stating that such has occurred will be included with the subject's data on the individual results validity form.

b. Individual Neuropsychological Tests

- (1) Quality control of administration standardization will be achieved largely through direct observation of the technicians by the chief neuropsychologist, the lead psychology technician, or a VHS staff psychologist. For the individual testing, the observer will be seated so that the test table is in full view. During Phase I of the study, each technician will be observed for two hours per week and during Phase II for a minimum of one hour per month. The observers (chief neuropsychologist, staff psychologist or lead technician) will keep a log noting observations on each technician's administration. Immediate feedback will be provided to the technician regarding the adequacy of his/her standardization. Errors in administration will be corrected in one of several ways, to be documented in the observer's log book:
 - (a) Minor Problems: Discussion of proper administration.

- (b) Moderate Problems: Discussion plus a second direct observation on a practice subject, such as another technician. This second observation shall be conducted within 48 hours.
- (c) Severe Problems: Discussion plus suspension from active testing until administration adequacy is assured.
- (2) Observation sessions with practice participants will be conducted until administration is entirely accurate. If such problems arise in Phase II this technician will be observed on the Phase I schedule (approximately two hours per week) for one month. Failure to achieve accurate administration may, of course, lead to termination.
- (3) In addition to accuracy of administration, scoring reliability must be achieved. Two different types of problems are present in assuring reliability. The technicians must first accurately record the behavior of the participant. Second, they must accurately score the behavior recorded. The neuropsychological tests included in the battery vary significantly in the relative difficulty of these two components. On the Rey-Osterrieth Complex Figure Test (Copy Trial), for example, the technician need not be concerned about recording the details of the participant's performance except to produce an accurate flow chart; the participant himself produces a permanent record. Scoring of responses, however, requires careful training and well-specified rules. In contrast, it takes a good deal of training and experience to record accurately the performance features of a participant's performance on Block Design, while scoring the final product is quite straightforward. In recognition of these differences among tests, the establishment of scoring reliability will vary with the specific test.
- (4) The following tests are those which require significant training in accurate recording of the participant's behavior: Block Design, Rey-Osterrieth Complex Figure (copy condition) flow chart, Wisconsin Card Sort. Scoring should be quite straightforward for the following tests: PASAT, CVLT, Word List Generation, WEAT-R, and Grooved Pegboard where no judgment is required in scoring and no complex decisions need be made in the recording of the participant's behavior.
- (5) Each technician will be individually evaluated for administration and scoring accuracy by either the consulting neuropsychology technician, the chief neuropsychologist or the lead technician. No technician will be allowed to test until he/she has successfully

completed the practice protocol. During observation the evaluator will be a third-person observer, scoring the protocol in conjunction with the technician administering the protocol. The technician's scoring will be compared with the evaluator's scoring. All discrepancies will be discussed and consensus over differences achieved. Significant discrepancies will require additional training and reevaluation of the technician's performance. If reevaluation is necessary, this will be documented in the supervision log book. Failure to achieve accurate recording may result in reassignment or termination. The specific variables to which this criterion shall be applied are:

- (a) PASAT - Total number correct across all trial blocks.
Total number of omissions across all trial blocks.
Total number errors across all trial blocks.
- (b) CVLT - Accurate recording of responses on the seven free recall trials with the Monday list, the Tuesday list, the two cued free recalls of the Monday list, and delayed recognition trial of the Monday list.
- (c) Word List Generation - Accurate recording of words correctly and incorrectly produced across all conditions (i.e., letters and animals).
- (d) WRAT-R - Total number of words correctly read.
- (e) Grooved Pegboard - Time for right hand.
Time for left hand.
Number of pegs dropped with right hand.
Number of pegs dropped with left hand.
- (6) Quality control will be maintained on these tests through the scheduled observation periods. The observer shall score performance on this set of tests as they are performed. All discrepancies will be discussed with the technician. The tape recording of the Word Fluency Test will be available to resolve discrepancies for that test. The observer's comments will be recorded in the log book.
- (7) Documentation of these procedures shall be as follows:
The scores obtained by each technician on each test will be recorded. If a second set of tests needs to be scored, that fact will be logged by the lead technician or chief neuropsychologist and initialed by the technician.
- (8) The following tests are those which require significant training to score accurately the participant's performance (or final product): Rey-Osterrieth Complex Figure (copy and both recalls), and WAIS-R Information subtest. For these

tests, each technician will be provided with the same four sample tests to score (according to instructions detailed later in this manual). Their scoring will then be compared with that of the chief neuropsychologist or the lead technician. Across the four sample tests of a given type, the mean deviation of the technician from the standard shall be less than two points. The specific scores to which this criterion will be applied are:

(a) Rey Figure - Total points on copy.
Total points on immediate recall.
Total points on delayed recall.

(b) WAIS-R Information - Total raw points.

- (9) Any technician failing to achieve this criterion will be given further training. After detailed discussion of the nature of their differences from the standard score (of the chief neuropsychologist or lead technician), an additional four samples of the tests on which they did not meet the criterion will be scored. This procedure will be repeated until the criterion has been achieved.
- (10) The above procedures will be documented. The scores obtained by each technician on each variable will be recorded. Any corrective procedure initiated will be documented in the observer's log book and initialed by the technician. The sample tests used in training and documentation of reliability will also be used in training replacement technicians.
- (11) Quality control of scoring accuracy will be maintained throughout the study. For the test deemed to require significant training in scoring accuracy (Rey-Osterrieth Complex Figure) blind scoring by another technician will be performed. The double scoring technician will initial each test form in the remarks box and discuss scoring differences of more than two points with the technician who administered the test to resolve possible discrepancies. If discussion does not resolve the discrepancy, the lead technician or chief neuropsychologist will be consulted to resolve the difference. Scoring differences of less than two points will be left as scored by the original technician. Scoring differences of five points or greater MUST be reported to the lead technician who will record this observation in the log book (initialed by the technician) and resolve the discrepancy with each technician. Protocols will be double scored throughout the duration of the study.

c. Individual Personality Test

- (1) The Diagnostic Interview Schedule (DIS) will be handled differently than the other tests. The first edit for every DIS will be done by a Lovelace editor. An edit sheet will be filled out for each interview. The edit sheet serves as a documentation of the edit and of retrieval of data. All problems found in the interview will be recorded on this sheet. Corrections made by the editor and/or the technician will be initialed on the edit sheet. Each editor will keep a daily editor's log. This log will include case numbers of all cases he/she edited in that day.
- (2) During the first year, the first three interviews and every tenth interview thereafter will be audiotaped by each technician. Lovelace editors will utilize these tapes during the first edit. These cases will then be shipped to SRA in Baltimore for a second edit. The cases will be shipped along with the editor's log, and the edit sheets that correspond to those cases. The audiotapes to each of these interviews will be sent under a separate cover to protect confidentiality. A transmittal form will be filled out for all cases sent, and a separate transmittal for all the audiotapes sent. Photocopies of the transmittals and the editor's logs will be kept at Lovelace to protect against possible loss during shipment.
- (3) SRA will document both technician and editor errors for these cases on the same edit sheet previously used. They will return all interviews, audiotapes, edit sheets, and logs to Lovelace using the same transmittal system as described above.
- (4) All edit sheets will be reviewed by the technician and checked again by the editor. Each case will then be entered into the computer by data processing. The cases will be returned to the editors for computer cleaning. When all data are cleaned, the cases will be sent to medical records at Lovelace. All cases sent to medical records will be accompanied by a transmittal form. Copies of the transmittal forms will be kept by the editors. All edit sheets will be filed at Lovelace in Administration.
- (5) Additional procedures will be used to monitor data quality. Each interview room will be equipped with a microphone and supervisors will listen to interviews (or parts of interviews) at least once a week. Supervisors will also observe interviewers randomly assigned to a room with a one-way mirror and audio hookup. Each interviewer will be observed at least once a month. Interviewers will be videotaped periodically, and tapes will be reviewed by the interviewer and the supervisor. The camera will be

positioned so that the interviewer, but not the veteran, will be videotaped. Finally, meetings will be held at least once a week during which interviewers can ask questions or discuss problems related to questionnaire administration.

d. Group Tests

- (1) Reliability in the administration of the group tests will be achieved through observation of the technicians by either the chief neuropsychologist or the lead technician. Each technician will be periodically observed throughout the study. Any problems in performance will be noted in the observer's log book in terms of the specific problems noted. If significant problems are noted they will be discussed, and the technicians will be observed on all subsequent group administrations until accuracy is achieved.
- (2) It is acknowledged that the above procedures necessitate some clinical judgment by the observers in terms of the severity of administration errors. Further, the above procedures are specifically limited to "mild" administration errors, errors that do not involve misrepresenting the test instructions (e.g., lack of clarity or fluency). Any errors that could misrepresent test purpose or contravene specific instructions will result in temporary discontinuation of a technician administering group tests. He/she will have to demonstrate correct administration instructions to the chief neuropsychologist or lead technician before being allowed to test subjects again in the group setting.

e. Training New Technicians

- (1) By hiring technicians who are aware of the painstaking effort involved in collecting research data, we have attempted to minimize attrition of our staff. Nevertheless, we anticipate some loss of technicians and the need to train new staff.
- (2) Most of the training conducted from February 11, 1985, to March 8, 1985, has been videotaped. (The major exceptions to this are:
 - (a) Diagnostic Interview Schedule training [2/17-2/27] because of objections by trainers and
 - (b) Periods during which technicians engage in small-group or one-to-one practice of specific tests.)

- (3) Tapes will be available for training new technicians in conjunction with individual training by the lead technician or experienced technicians.
- (4) For training on the Diagnostic Interview Schedule, the lead technician and experienced technicians will be prepared to train new technicians. One technician and one editor will attend a DIS training workshop at Washington University for advanced training to work with new technicians.
- (5) Individual supervision in test administration will be provided by the chief neuropsychologist, the lead technician, and experienced technicians.
- (6) Before a new technician is allowed to begin testing subjects, he/she will have to meet the quality control criteria specified in Section 5b. The same videotapes and test protocols will be used, ensuring that they have been trained to the level of the original group of technicians. Further observations will parallel the schedule for the original technicians: 2 hours per week during Phase I and one hour per month thereafter for the individual tests, and for the DIS, as noted in Section 5c.

6. Backup

Backup supplies of all test materials and equipment (e.g., tape recorders, stopwatches, test booklets, etc.) will be on site so that loss or damage will not interfere with testing the full complement of subjects. All expendable supplies (e.g., answer sheets) have been ordered with a 10% oversupply to allow for the necessity of testing more than 10,000 subjects and training. Supplies will be formally inventoried monthly to assure timely replacement.

7. Initiating Testing

- a. Every Tuesday through Friday, subjects will be brought to the test site at the Clarion-Four Seasons by 8:00 a.m. following breakfast.
- b. The technicians will arrive at the test site at 7:45 a.m. The technicians assigned to individual testing will go to their respective rooms. The technician assigned to group testing will go to the participants' lounge to meet the participants and bring them back to the group testing room.
- c. The technician assigned to group testing will give a general introduction to the psychology portion of the study saying:
 - (1) "Good morning, my name is _____. I am one of the psychology technicians for this study. This is the second

day of your evaluation and today's evaluation is the psychology assessment section. The psychology portion is made up of individual and group administered tests. The morning session will consist of a personality questionnaire and individually administered tests. These tests are assessments of certain cognitive abilities such as memory, concentration, problem solving, reading, writing, arithmetic, comprehension and hand use as well as some general personality tests."

- (2) "The afternoon session consists of a structured interview and other group administered tests. You may find that some of these tests are difficult or frustrating. Please keep in mind that these tests are designed to be demanding. Just do the best you can."
 - (3) "During this testing it is important that you do not volunteer any information regarding your military experiences UNLESS you are specifically asked a question for which this information is a necessary part of the answer. It is also important that you do not discuss the tests with participants who have not yet taken them."
 - (4) "Okay, now, I am going to pass out numbered badges for you to wear for the duration of the day. I will read the six or seven-digit number that has been given to each of you. Please look on your wristband and raise your hand when your number is called. When you receive your badge, please pin it on your shirt or jacket so that it is easily visible. Please wear the badge for the entire day and turn it over to the technician you are working with at the end of the afternoon before you leave the site."
- d. The technician will then read each participant's six or seven digit number and hand out the numbered badge that matches the number (1-28) to the left of the participant's name on the list for that day. If there is any discrepancy in the six or seven digit number on any participant's wrist, the lead technician or chief neuropsychologist will be notified immediately to correct any errors in identification.
 - e. All subjects wearing odd-numbered badges will then be assigned to individual testing for the first part of the morning session while all subjects with even-numbered badges will have the MMPI testing.
 - f. The technician will again say: "On the badges you just received is a number. Those of you with even numbers will have a personality questionnaire first and will attend an individual test session later in the morning. Those of you with odd numbers on the badge will attend individual testing first and/or the personality questionnaire later in the morning. The

numbers on the badges are the same as numbers on the individual test rooms. All participants with EVEN-numbered badges are to go to the individual rooms first for a short reading test. The technician working with you will look at your badge to ensure that you are in the correct room. All of you with even-numbered badges should now go to the individual test rooms where a technician will meet you. All of you with odd-numbered badges will remain here until the other participants return."

- g. After the even-numbered participants have gone to take the reading test, the technician will tell the remaining odd-numbered participants, "Please form two lines in front of the room to take the Breath Alcohol Test," and proceed with the administration.
- h. Participants with odd-numbered badges will undergo the Breath Alcohol Test (BAT) administered by the group technician with the assistance of editors or other technicians. This test requires approximately one minute per participant. Three BAT instruments will be delivered to the group testing room at 8:00 a.m. each day along with the results sheet. Participants will be asked to form two lines (one BAT instrument is held on reserve), and the test will be administered. Readings will be recorded and then verified by two technicians. The instruments will be returned to the medical testing section when all tests are complete for recalibration. BAT levels will be recorded by the group tech and verified by both administrators from the digital readout on the instrument. The cutoff for the BAT is 0.005. If a participant fails this criterion (>0.005), and he has been assigned an odd number (so is to be tested individually in the first half of the morning) then he will switch with an even-numbered participant and will do MMPI testing in the first half of the morning. He will be tested again after the MMPI to determine breath alcohol level and individually tested later in the morning. Breath alcohol level should be recorded on the individual validity form if the participant's level is >0.05 .
- i. The even-numbered participants will go to their respective individual test rooms to be given the WRAT-R reading subtest while breath alcohol testing is being conducted with the odd-numbered participants. After the participants with the even-numbered badges have returned from the reading test, the odd-numbered participants will go to their respective individual test rooms, and the even-numbered subjects will remain in the group room for the Breath Alcohol Test followed immediately by the MMPI.
- j. For the even-numbered participants' reading test, individual test rooms are consecutively labeled with one even and one odd number from 1-28. Thus, participants need only match their badge to the number on the door. The technician will first

check the badge to determine that the participant is in the right room and then introduce himself/herself to the participant saying,

"Good morning, I am _____(first name). This is the beginning of the psychological testing for this study. I am going to give you a brief reading test before you start on the MMPI tests this morning."

- k. The technician will ask the participant for his age, number of years of formal education and I.D. number. The participant will then be handed a form containing a series of words (WRAT-R Reading) with the technician then administering the test as indicated in the Test Administration and Scoring Section of this manual. The technicians will then score each WRAT-R reading test as indicated in Test Administration and Scoring Section of this manual. The participant's code number, name, and age will be written on the "Name" sheet of the WRAT-R scoring form and the technician will fill in the raw score and grade equivalent on a WRAT keypunch form. The technician will put his/her technician # and initials on the "Examiner" line of the answer form and on the key punch form and will then take the scored WRAT-R and keypunch form to the technician responsible for MMPI testing at that time. The WRAT-Rs will then be double scored.
- l. For individual testing, the technicians will meet the participants at the door of the individual test rooms, checking to see that the badge number matches one of the numbers on the testing door. If correct, the technician will take the participant to a testing room and will introduce himself/herself saying, "Hello, my name is _____(first name) and I am going to be working with you this morning. Please come in and have a seat." The technician will indicate the chair the participant is to take while making the above statement. After both the participant and the technician are seated, the technician will communicate the following information:

"This is the beginning of the psychological testing portion of this study. I am going to give you a number of different tests this morning. Some of the tests will be difficult and some may be quite easy. We will not try to trick you at any time. We do not expect anyone to know all the answers or to be able to get everything correct. What we ask you to do is try to do your best whether the tests are very easy or very hard. Although these tests can usually be completed in one sitting, if you need a break just tell me and we can take about 5 minutes at the first available time. Although some of the tests may not seem meaningful to you, each was carefully chosen to measure various psychological or neurological processes. Again, it is important that you do not discuss the tests with participants who have not yet taken them."

- m. The session will proceed with one of two test orders determined previously (see Section 2.d.1.). Test orders have been assigned to each room in an alternate fashion so that rooms next to each other are administering a different test order.
- n. When the technician completes testing with the first participant of the morning, he/she will ask him to take a break and then return to the psychology group testing room to take the MMPI. The technician will then set up for the next participant.
- o. For the MMPI testing, the technician monitoring the testing will introduce himself/herself saying,

"I am going to be monitoring the group testing this morning. This is the beginning of the psychological testing portion of this study. You will be given a personality questionnaire first this morning and then you will be doing individual testing with one of the technicians later this morning. This afternoon you will be finishing the group testing session and will then be given a structured interview. I will briefly introduce and discuss each test before you begin working on it. Because the tests are all computer scored, you must use only the special test pencils that I will give you."
- p. The technician will pass out the #2 test pencils, the MMPI answer sheets and the MMPI booklets saying, "Please do not make any marks on the answer sheet until instructed to begin. Leave the questionnaire booklet closed until I have completed all the instructions."
- q. After all the materials have been handed out, the technician will say, "On the top, left hand corner of your answer sheet are 9 boxes labeled client identification. Place a 'zero' in the first 2 boxes and then write your 6- or 7-digit identification number in the next 6 or 7 boxes. If you have a 6-digit number, place a "ZERO" in the last box." (The technician will put an example on the blackboard: 009000000) "Blacken in the circle below each box that is the same as the number in the box. Then blacken in the circle beneath the word 'male' and complete the age box, blackening the correct circles. Please blacken in each circle completely so the computer can read it accurately."
- r. After the answer sheets have been filled out, the technician will identify the badge numbers of the participants who received a grade equivalent score of 6B or less on the WRAT-R reading test and ask them to take their answer sheets and booklets and to please follow the person assisting with the group testing.

- s. The assistant will take these participants to the tape room and will discretely and quietly say, "The test you are going to take now requires a reading level higher than you scored on the reading test, so we would like you to take the test from a taped version." The assistant will then show the participant(s) how to operate the recording, paying particular attention to the "pause" and "rewind" controls.
- t. When the group testing assistant has taken the participant(s) who will take the taped version of the test out of the room, the technician will say to the remaining participants, "When I tell you to begin, open the booklet to page one, read the instructions and continue. When you have finished this questionnaire, turn it in to me."
- u. The technician will then say, "Lunch will be served in this room from 12:30 to 1:15. At 1:15, please return to the lounge for a 15 minute break. You will be brought back in for testing at 1:30 to begin the afternoon sessions. OK, open your booklets and begin."
- v. For the afternoon testing session, the technician responsible for group testing will pick the participants up from the lounge at 1:30 and take them to the group testing room. The technician will say,
- "Good afternoon, you will be completing the psychological portion of your evaluation this afternoon. Half of you will be going to the individual testing rooms to complete a structured interview and the other half will remain here to complete the group testing. You will switch at about 3:00 this afternoon. Whichever group you are in, please make sure that at the end of the day you check in with your participant advocate BEFORE going back to your room. Now, if all participants with odd-numbered badges will go to the individual rooms that match your numbered badge, a technician will meet you to complete your individual testing. All those with even-numbered badges will remain here to complete your group testing."
- w. After the odd-numbered participants have left, hand out the Satisfaction Questionnaires to each participant and say:
- "I am now handing out a Satisfaction Questionnaire. This is your opportunity to tell us what kind of job we are doing. There is a section for each part of your stay here including the hotel, the food, the medical portion and the psychological portion. We would appreciate it if you took the time to fill this out so that we can make any changes or improvements that are necessary. You are welcome to fill this out TONIGHT OR THIS AFTERNOON, whenever you have any spare time. Please wait to fill out the last two pages until AFTER you have seen the doctor and the psychologist tomorrow. You can then turn it in to your participant advocate."

"As a reminder from this morning, I will briefly introduce and discuss each test before you begin working on it. Be sure to use only the special test pencils that I will give you, and please do not open any test materials until everyone has received a test booklet and you are instructed to begin."

- x. The technician will then pass out the test materials and pencils for the verbal portion of the Army Classification Battery (ACB). Forms VE-1B and VE-2B will be distributed alternately to the seated participants. After this section is completed the technician will alternately distribute the AR3B and AR4B and proceed with administration.
- y. After the ACB is completed, the technician will proceed with the Edinburgh Handedness Inventory. This inventory determines the frequency with which each participant uses his right and/or left hands in routine tasks. The technician will hand the forms out FACE DOWN and say,

"I am handing out the test now and I want you to leave it face down on the table until I ask you to turn it over. This is an inventory examining hand use preference. Please turn your papers over now and put your name in the blank in item 3, on the left hand side of the page. Then put your 6-digit participant number above your name. Please do not fill out any of the information on the right hand side. Now look down the page to the instructions and read along, silently, as I read aloud."

"We are interested in finding out which hand you prefer to use to perform everyday tasks. Please indicate your hand preference by placing a check in the appropriate column. The choices are: always right, usually right, either hand, usually left or always left."

"Look at the example. You can see that this person checked usually right for the task of opening a door."

"Now turn the page and mark your choices for each task as I read them aloud. The tasks are:

- A. Writing
- B. Drawing
- C. Throwing
- D. Using scissors
- E. Using a toothbrush
- F. Using a knife without a fork
- G. Using a spoon
- H. Top hand when holding a handle of a shovel
- I. Striking a match
- J. Twisting off the lid of a jar."

After the handedness inventory has been concluded, the technician will end the group session saying, "This is the end of the group testing for this afternoon. Please go to the lounge and take a break. A technician will come and pick you up for the structured interview. PLEASE, at the end of the day, remember to go to the lounge and check in with your participant advocate before returning to your room. We appreciate all of your cooperation throughout the day."

- aa. While the even-numbered participants are in group testing, the odd-numbered participants will go to take the DIS. When the odd-numbered participant arrives at his assigned room, the technician will take the participant to his/her room to administer the DIS. The technician will introduce himself/herself, saying, "Hello, my name is _____ (first name), I will be working with you this afternoon to complete the individual section of your testing. Please come in and have a seat." The technician will have checked the WRAT-R to see if the participant used a tape recorder for the MMPI. If so, the technician will read the drug card from the DIS to the participant and will provide an audiotape for the Combat Exposure Index at the appropriate time. The technician will then begin administering the DIS with the following introduction: "In this interview I'll be asking you questions that may or may not apply to you. The interview is standardized and I'll need to ask all of the questions. Please answer as clearly as you can. These questions apply to any time in your life including your military experience. Sometimes I may ask if you told doctors about symptoms and I'll mean doctors you told before coming to the study. Some of these questions may be hard to understand. I'll be glad to repeat or clarify any question. All of your answers are confidential."
- bb. When the DIS is completed, the technician will administer the Combat Exposure Index. The participant will be told, "You may take a break now, and report back to the psychology group testing room by 3:00 to complete your group testing."
- cc. When all of the odd-numbered participants have returned to the group testing room, the technician will follow the introduction and instructions used for the afternoon's first group. At the conclusion of the Edinburgh Handedness Inventory, the technician will end the afternoon group session saying, "This is the end of the psychological portion of the testing. Please go now to the lounge and check in with your participant advocate before returning to your room. We appreciate all of your cooperation throughout the day." The technician will then collect the numbered badges and dismiss the participants.

8. Behavioral Observations and Routing of Test Results

- a. At the completion of each half-day of testing, all data for each subject, both quantitative and qualitative (behavioral observations), will be sent to Data Analysis.
- b. Lezak (1983) provides the clearest conception of the value and information contained in qualitative data with the following:
 - (1) Qualitative data are direct observations. In the formal neuropsychological examination these include observations of the participant's test-taking behavior as well as test behavior per se. Observations of the participant's appearance, his verbalizations, gestures, tone of voice, mood and affect, personal concerns, habits and idiosyncrasies can provide a great deal of information about his life situation and overall adjustment, as well as his attitude toward the examination and his condition.. More specific to the test situation are observations of the participant's reactions to the examination itself, his approach to different kinds of test problems, and his expressions of feelings and opinions about his performance. Observations of the manner in which the patient handles test material, the wording of his test responses, the nature and consistency of his errors and his successes, fluctuations in attention and perseverance, his emotional state, and the quality of his performance from moment to moment as he interacts with the examiner and with different kinds of test material are the qualitative data of the test performance itself.
 - (2) Two kinds of behavior are of special interest to the neuropsychological examiner when evaluating the qualitative aspects of a participant's behavior during the examination. One, of course, is behavior that differs from normal expectations or customary activity for the circumstances. Responding to Block Design instructions...by matter of factly setting the blocks on the stimulus cards is obviously an aberrant response that deserves more attention than a score of zero alone would indicate. Satisfaction with a blatantly distorted response, or tears and agitation when finding some test items difficult also should elicit the examiner's interest, as should statements of displeasure with a mistake unaccompanied by an attempt to correct it. Each of these behavioral aberrations may arise for any number of reasons. However, each is most likely to occur in association with certain neurological conditions and thus can also alert the knowledgeable examiner to look for other evidence of the suspected condition.

- (3) Setting blocks on the stimulus cards usually indicates relatively severe frontal lobe pathology, such as that which can occur with very severe trauma or advanced presenile dementia of the Alzheimer's type (PSDA). The inappropriately pleased participant may have suffered prefrontal damage, most likely involving the right frontal lobe, or he could have fairly extensive right posterior damage from a stroke or tumor. Tears and agitation in the face of a difficult task suggest a catastrophic reaction, which is most likely to accompany left hemisphere disease. Participants who may correctly evaluate their performance errors but do nothing to rectify them are usually displaying the behavioral discontinuities characteristic of prefrontal damage.
- (4) Regardless of their possible diagnostic usefulness, each of these aberrant responses also affords the examiner a sample of behavior which, if characteristic, tells a lot about how the participant thinks and how he perceives himself, the world, and its expectations of him. The participant who sets blocks on the card not only has not comprehended the instructions, but also is not aware of this failure as he proceeds unself-consciously with this display of very concrete, structure-dependent behavior. The participant who expresses pleasure over an incorrect response is also unaware of his failure but, along with a distorted perception of the task, his product, or both, he demonstrates self-awareness and some sense of a scheme of things or set of self expectations that his performance satisfied.
- (5) The second kind of qualitatively interesting behaviors deserves special attention whether or not they are aberrant. Gratuitous responses are the comments participants make about their test performance or while they are taking the test, or the elaborations beyond the necessary requirements of a task that may enrich or distort their drawings, stories, or problem solutions, and usually individualize them. The value of gratuitous responses is well recognized in the interpretation of projective test material, for it is the gratuitously added adjectives, adverbs, or action verbs, flights of fancy whether verbal or graphic, spontaneously introduced characters, objects, or situations, that reflect the participant's mood and betray his preoccupations. Gratuitous responses are of similar value in neuropsychological assessment. The unnecessarily detailed spokes and gears of a bike with no pedals...tell of the participant's involvement with details at the expense of practical considerations. Expressions of self-doubt or self-criticism repeatedly voiced during a mental examination may reflect perplexity or depression and raise the possibility that the participant is not performing as well as he might.

c. Any significant behavioral observations should be noted in the "Remarks" box of each test answer form and then written in the Results Validity form.

(1) Significant Behavioral Observations

- (a) Extreme movement factors: Fidgeting, squirming, drumming fingers, rising from chair, frequent change of position in chair, tapping feet, picking at self, rocking, tics, twirling hair (moustache), muttering to self.
- (b) Poor attention factors: Frequent requests for repetition of instructions, attending to extraneous visual stimuli, orienting to sounds, staring into space, long periods of unresponsiveness (>30 seconds) that are not OBVIOUSLY concentration or thinking, performing task in incorrect manner after directions have been given.
- (c) Emotional factors: Fearfulness, anger, excessive sweating (wet palms), change in voice volume, tremulousness, poor eye contact, mood swings, INAPPROPRIATE laughing/giggling, stuttering/stammering, tense, flat affect, anxious (palms cold), tearfulness, frustration outbursts, withdrawal.
- (d) Compliance factors: Test/test item refusal, complaining about test (difficulty/test relevance), request for discontinuation ("I can't"), negative comments about tests, inappropriate invectives, abusive language.
- (e) Fatigue factors: Yawning, closing eyes, statements about being tired, falling asleep, postural changes (slumping), increase in responses minimal.
- (f) Physical handicap factors: Squinting/straining eyes (during presentation of visual material), obvious hearing problems OR complaints, paralysis/weakness (specify side, body part), TEMPORARY disability obvious or complained of (e.g., broken/sprained wrist, eye patch, plugged ears), tremor, amputations. Document ANY prosthesis observed (glasses, hearing aid, artificial limb, etc.).
- (g) Language factors: Nonstandard English, slurred speech, mispronunciation, nonwords (neologisms), poor understanding of verbal instructions, misreading words, paraphasic errors, press of speech, minimal responses, low or high volumes, word finding problems, lack of prosody, lack of inflection.

9. Instructions for Administration and Scoring

a. Individually Administered Tests

For all tests, it is essential that participant name (last name first), ID number, date, technician number, and test order number be accurately included on every answer form or drawing. All computerized forms require all necessary bubbles to be filled in completely with standardized computer test pencils. Technicians should ensure that participants adequately understand test instructions prior to beginning test. For tests which require verbal responses, the following symbols will be used: Q (for query), NR (no response), DK (don't know), and RX (repetition of instructions). Always enclose these symbols (except DK) in parentheses when used.

(1) California Verbal Learning Test General Instructions

- (a) This test requires the examiner to present a list of 16 words (one per second) to be recalled by the participant. The list is presented as a "Monday Shopping List." The participant recalls as many words as possible from the list in any order. This presentation and recall are repeated four additional times for the Monday list with the participant recalling as many words as possible from the list after each presentation. The participant is then given a "Tuesday Shopping List" of 16 different words (one per second) and asked to recall it in any order. Following the recall of the Tuesday Shopping List, which acts as an interpolated interference list, the participant is again asked to recall the Monday Shopping List.
- (b) After the intermediate recall of the Monday list (i.e., after the Tuesday list), the participant is then given semantic cues (cued recall) and asked to recall words found in a specified set of categories. That is, "Tell me ALL of the shopping items from the Monday list that are spices & herbs, ..fruits..tools... clothing."

Twenty Minute Delay: After 20 minutes of interpolated testing, the examiner asks the participant again for a free recall of the Monday list (long delayed free recall), then repeats the cued recall performed earlier (long delay cued recall), and finally presents a recognition trial (long delay recognition trial). On the recognition trial, the participant is asked if the words read to him from a long list of words were on the Monday list (Yes) or not (No).

- (c) For all trials it is important to encourage guessing. The order and words recalled by the participant are

recorded on the answer sheet, even those words recalled not on the original lists. If the participant seems to be pondering over recall of additional words, allow 10 seconds maximum before asking "Any others?" or "Is that all?" Allow one (1) minute maximum to respond if the participant does not verify that he is done for that trial.

(2) California Verbal Learning Test Participant Instructions

(a) To be read exactly as stated:

(Trial 1) "Let's suppose you were going shopping on Monday. I'm going to read a list of items for you to buy. Listen carefully, for when I'm through, I want you to say back as many of the items as you can. It doesn't matter what order they are in--just tell me as many as you can." (Encourage guessing.)

(Trials 2-5) "I'm going to repeat Monday's Shopping List. Again, I want you to say back as many items as you can, in any order, including items you may have already told me."

(Instructions for Tuesday List) "Now let's suppose that you planned to go shopping again on Tuesday. I'm going to read a NEW list of items for you to buy. When I'm through, I want you to say back as many as you can, in any order." (Record responses verbatim.)

(Short Delay Free Recall) "Now I'd like you to tell me all of the shopping items you can from the MONDAY list." (Record responses verbatim.)

(Short Delay Cued Recall) "Tell me all of the shopping items from the Monday list that are spices and herbs,..fruits..tools.. clothing." (Record responses after each cue. Record time of end of Short Delay Cued Recall in space provided on answer sheet.)

After the short delay cued recall, 20 minutes of nonverbal tests will be administered based on the order determined previously (see Section 2.d.1.). Then administer the long delay free recall for this test.

(Long Delay Free Recall) "I read some shopping items to you earlier. I'd like you to tell me all the items you can from the "Monday" list--that was the first list I gave you." (Record responses. Record time of beginning of Long Delay Free Recall in space provided on answer form.)

(Long Delay Cued Recall) "Tell me all of the shopping items from the Monday list that are clothing...fruits...tools...spices and herbs." (Record responses after each cue.)

(Long Delay Recognition) "I'm going to read a list of shopping items. After I read each item, say 'YES' if the item was from the MONDAY list and 'NO' if it was not." (Record responses.)

(3) California Verbal Learning Test Scoring Instructions

- (a) The technician will write down the participant's verbatim responses in the order in which they were given for:
1. Trials 1 - 5 of the Monday list.
 2. The single trial of the Tuesday list.
 3. The intermediate recall (short delay free recall) of the Monday list.
 4. The intermediate cued recall (short delay cued recall).
 5. The long delay free recall.
 6. The long delay cued recall.
- (b) The technicians will also record the code for each stimulus word alongside each word recalled. These codes are symbols (0-9,-,=,Q,W,E and R. Intrusions will be coded by category as follows: Monday list: clothing Z1, fruit Z2, spices Z3, tools Z4, other Z5. Tuesday list: utensils Z1, fish Z2, fruit Z3, spices Z4, other Z5) used by the computer scoring program to determine the number and order of stimuli recalled. For the cued recall (above), the technician will write the verbatim responses within each category and record the appropriate code.
- (c) For the long delay recognition task of the Monday list, a check will be placed in the one blank space to the right of each word if the participant answers "yes" (indicating he thinks the item was in the Monday list). If the participant says "No," no mark will be placed in the empty box at all. The participant can make five types of errors in the recognition task as given below:
- TR: Tuesday words semantically related to the categories on the Monday list.
- TU: Tuesday words NOT semantically related to any of the categories on the Monday list.

NR: New words (not Monday or Tuesday list words) that are semantically related to the categories on the Monday list.)

NU: New words not semantically related to any of the categories on the Monday list.

PS: Words phonetically similar to words on the Monday list.

(d) The classification of recognition error types is indicated on the score sheet. In addition, the number of correctly recognized Monday words will also be calculated.

(e) The CVLT is complete if all 10 recall and the recognition trials have been administered.

(4) Rey Complex Figure Drawing Test General Instructions

(a) On this test the technician is to present the participant with the Rey Complex Figure oriented so that its length runs along the horizontal plane of the participant (diamond on participant's right). Instruct the participant to copy the figure as accurately as possible. If the participant tries to reorient the drawing you must instruct him to leave it in its current orientation. If the participant rotates his paper and draws the figure ask him which way he wants his paper to be oriented so that it looks just like the figure and mark his sheet with a "T" indicating the top of the design. The participant is timed on how long it takes him to complete his work for each of the three trials.

(b) While the participant is drawing the copy, the technician is to draw a flow chart of the participant's drawing on a separate sheet of paper, numbering each line, as the participant draws it. This enables reconstruction of the exact order of the participant's drawing later. Flow charts will not be drawn for immediate and delayed recall drawings.

(c) Immediately following the copy of the figure, the technician is to take away the first drawing of the design plus the Rey model, give the participant a sheet of paper and ask him to draw the same figure from memory. The technician is to be sure to identify the different drawings. After a 20-minute delay, again ask the participant to repeat the drawing from memory.

(5) Rey Figure Copying Test (Complex Figure Copying)
Participant Instructions

- (a) Place a pencil and a sheet of clean white paper horizontal to the participant with the Rey figure horizontal to the participant right above the paper and say, "I want you to copy this picture. Draw it as accurately as you can. If you draw a line that is a mistake simply scribble through it and continue with the drawing. Do not erase. This is not a speed test though I will be timing you just to see how long it takes. Do you have any questions?" (Answer questions.) "Go ahead and draw the figure." Draw a flow chart of the participant's drawing as he works.
- (b) If the participant attempts to reorient the model say, "No, it must remain in this position."
- (c) If the participant reorients his own paper as he draws wait until he is finished and ask, "Which way do you want your drawing to face?" Then draw a "T" to indicate the top of the design and fill in demographic information on flow chart and participant sheets.
- (d) Immediate recall of Rey Figure

Immediately after the participant copies the figure, take away the original drawing and design and say, "Now I want you to draw the picture again from memory. Draw it as accurately as you can." If the participant refuses or gives up, encourage him to try and do the best he can.

(e) Delayed Recall of the Rey Figure

Following a 20-minute delay say, "Remember that picture you copied and then drew from memory about 20 minutes ago? I want you to draw it one more time for me. Remember to draw it as accurately as you can." If the participant protests, say, "I realize that it is hard but do the best you can."

(6) Rey-Osterrieth Complex Figure Scoring Instructions

- (a) All the demographic information is recorded on the top left corner as indicated. A diagram of the "Rey" figure is designated in the upper right corner below the "participant name" box. Numbers on the figure represent discrete scoring sections corresponding to the descriptions (1 through 18) on the left center portion of the sheet (Lezak, 1983). Each discrete scoring section can receive a score of 0, .5, 1, or 2,

based on the criteria listed for scoring in the lower left corner. This scoring procedure is completed for the copy task, and the immediate and delayed memory tasks. Blacken in the appropriate point circle for each section on all three tasks. Add the number of points, represented by the blackened circles, for each task and enter the respective totals in the space provided for each task. Then blacken in those corresponding point circles in the lower right corner. Paper clip drawings to scoring form before turning in the scoring.

- (b) Should preliminary training with Lezak's (1983) scoring criteria fail to achieve the two point scoring reliability criterion for all technicians within two weeks prior to the testing of the first group of real participants, a specific scoring manual will be created with examples of scoring procedures. Preliminary data suggest that this reliability figure may be easily reached without a specific manual. Blind scoring will be done for all protocols, as described in the section on quality control.
- (c) The Rey Complex Figure is complete if all three trials have been attempted and a flow sheet of the copy trial is included.

(7) Wisconsin Card Sort Test General Instructions

- (a) This is a test of the participant's ability to develop solutions on a classification and problem solving task as well as his ability to shift strategies based on minimal feedback.
- (b) The test is comprised of four category cards and two decks of 64 cards. The four (4) stimuli are placed in front of the participant (from his left to right) in the following order: A card with a single red triangle (base down), two green stars (two points facing down), three yellow crosses (two crosses on top and the single cross on the bottom), and four blue circles. The three possible ways to sort the cards are by color, form (shape), and by number of figures on the card. The participant must figure out how to sort each card without the examiner's direction, stacking participant's choices below the four category cards. He is NOT told how to sort the cards nor the possible ways to sort the cards. He is only told if he is right or wrong. The first category he must discover is color. After ten consecutive correct sorts by color, the examiner changes the correct category to shape. After ten consecutive correct sorts by shape, the

examiner changes the category to number (of shapes on the card). After ten consecutive correct sorts by number, the examiner repeats the whole cycle returning first to color, then shape, then number. The test is discontinued after six successful shifts (or categories) are completed, or after both decks have been used, or after any 64 consecutive cards have been placed without completing a correct 10 card category, whichever occurs first. If the test is to be discontinued due to 64 consecutive placements without a correct category completed, do not discontinue if the 64th card is a correct placement. Continue until a card is placed incorrectly and there stop the test. An exception to this rule is that if a participant is correct on the 64th card of the potential discontinuation, and then continues correctly and successfully completes a 10 card sort, continue with the entire test. The participant is given each card to sort, one at a time, and the examiner marks the score sheet with all of the possible ways the card matches. For instance, if a single red circle had been placed under the single red triangle category, the examiner would mark 'C' (for color) and 'N' (for number) because those are the two possible ways in which the participant's card matches the category card. Occasionally a card will not match color, shape, or number, and the category 'O,' for other is marked on the answer sheet. The technician must mark 0 (for wrong) or 1 (for correct) for each sort.

- (c) Do not let the participant pick up his card or other cards once they have been placed. If the participant tries to give up or appears to be providing little effort, encourage him to keep trying. When the participant has reached the criteria for shifting to a new principle (10 consecutive correct sorts) the examiner starts reinforcing the correct sorts in the new category WITHOUT TELLING THE PARTICIPANT that a new category has been selected. Following the test, it is best to keep the cards divided into four groups so they can be placed back in order for the next participant with minimal effort.

(8) Wisconsin Card Sorting Test Participant Instructions

- (a) Say to the participant, "This test is a little unusual, because I am not allowed to tell you very much about how to do it. You will be asked to match each of the cards in this deck to one of the four key cards." Point first to the deck and then to each of the four category cards. "I can't tell you HOW to match the cards, but I will tell you each time whether you are

right or wrong. If you are wrong, leave the card where you've placed it, and try to get the next card correct. When you are done with this test you will have a stack of cards below each of these cards." Point to where the subject should stack his choices, then point to the four category cards and say, "There are no time limits to this test."

- (b) If the participant gives up, say, "Keep trying. I know it's hard."
- (c) If the participant seems to be placing cards randomly without trying say, "Try and think about what you are doing."
- (d) Proceed until one of the discontinuation criteria (above) has been met.
- (e) AFTER the card sort test is completed, ask each participant, "Are you color blind?" If the participant answers yes ask, "Are you able to discriminate differences in SHADING?" Note responses in the remarks box of the WCST answer sheet. This is done after the test to prevent cueing of the color category.

(9) Wisconsin Card Sorting Test Scoring Instructions

This test is scored by CDC with a computer program. The test is considered complete if one of the following criteria is met: 1) 128 cards used; 2) six sorts completed (C, F, N, C, F, N); 3) 64 cards processed without a complete sort. Regarding the third criterion, do NOT discontinue after a correct response because it is possible that the participant has figured out a solution. If, after 64 cards, the participant makes an error without completing a sort, discontinue the test.

(10) Word Fluency Test General Instructions

The participant is given either a letter or category and told to produce as many words beginning with that letter or that fit the category in a given time period. The letters and categories (F, A, S, and Animals) have a one-minute time limit each. The examiner must record the participant's responses verbatim. Words are recorded on a record form which is divided into blocks. Each block represents 15 seconds. All of the words produced in the first 15 seconds are recorded in the first block. All the words produced in the second 15 seconds are placed in the second block and so on. In this way, a record is kept on how many words are produced in the first 15 seconds, second 15 seconds, third and fourth 15 seconds for each category.

If the participant gives up prematurely, encouragement is given (see participant instructions). Proper names (names beginning with capital letters), numbers, and various forms of the same word are not permitted when the participant is responding to the letter categories. Use a tape recorder to record participant's responses. Tapes are to be used as a review for scoring difficulties.

(11) Word Fluency Test Participant Instructions

- (a) Say to the participant, "I will say a letter of the alphabet. Then I want you to give me as many words that begin with that letter as quickly as you can. For instance, if I say 'N' you might give me 'nice,' 'new,' 'neat,' or 'need.' There are some rules you must follow, however. You may not use words that are proper names, like 'Nancy' or 'Nevada.' You cannot give me the names of numbers, like 'nine' or 'ninety.' Also, you cannot give me different forms of the same word, like 'nag' and 'nagging' or 'nice,' 'nicer,' and 'nicest.' Do you have any questions?" After answering any questions say, "Begin when I say the letter."
- (b) Say, "The first letter is F." (Time 60 seconds.)
- (c) Then say, "The next letter is A." (Time 60 seconds.)
- (d) Then say, "The next letter is S." (Time 60 seconds.)
- (e) Record the participant's responses under each category in the 15-second blocks provided on the form. Write down the participant's responses verbatim in the order given. Because the participant may respond too quickly to record all verbatim responses, this task will be recorded on tape.
- (f) After each letter is complete say, "Good" or "Fine."
- (g) After the letter categories say, "Now we're going to do it a little differently. I want you to tell me the names of as many different animals as you can in one minute. They can be animals from the farm, the zoo, the jungle, or the ocean, or anywhere. They can begin with any letter. Ready? Begin." (Time 60 seconds.)
- (h) As with the letters, keep a record of how many words are produced every 15 seconds by writing the participant's responses in the appropriate blocks and record the responses on tape.
- (i) If the participant seems to give up, or says, "I don't know," use the following prompts:

For the letters and numbers, say, "Keep trying" or "Tell me more." Make a note on the answer sheet as follows: (Q)

(j) If there is no response for 15 seconds, cue as follows:

For the letters say, "Tell me more words beginning with the letter ... (F, A, or S) as quickly as you can." Note (RX) on the form.

(k) For the other categories say, "Tell me more (category name, like names of animals) as quickly as you can." Note (RX) on form.

(12) Word Fluency Test Scoring Instructions

Fill in the demographic information at the top of page 1. Write the participant's verbatim responses for each letter or category in the order produced and in the spaces provided as appropriate. Responses will be written in columns down the page in 15-second segments. At the end of each 15 seconds, move to the next block down and continue recording up to one minute. Enter the total number of correct and incorrect words produced in each 15-second block for each letter and category in the space provided. Count as errors, words that are repeated (code as R), nonwords (X), or words not from the correct letter or category (X). For rapid responses, code response as dash (-). Include first letter of word prior to dash if possible. All errors, however, must be recorded verbatim. The taped record of performance shall be used to resolve uncertainty about whether a given response was an error. If the participant produces even a single word for a given category, the entire minute trial is considered complete.

(13) Grooved Pegboard Test General Instructions

This test requires the participant to place pegs that have a flange on the side, into grooved holes, one at a time, using only one hand, going as quickly as possible. The dominant hand is tested first, then the nondominant hand is tested. The score sheet should reflect the total time to complete the task for each hand and the total number of times the participant dropped the pegs. A peg is considered dropped if it falls outside of the dish in which they are stored and tally marks are placed outside the raw time box on right hand side. A zero is placed in this area if there are no drops. Do not allow the participant to use both hands or reorient the board at any time.

(14) Grooved Pegboard Test Participant Instructions

Place pegboard at participant's midline with the board 7 inches from the edge of the table and the peg tray immediately above the board. Examiner says, "For most of your daily tasks do you prefer to use your right hand, your left hand, or do you use either hand?" Record response on scoring form, then say, "When you were a YOUNG CHILD, did you prefer to use your right hand, your left hand, or did you use either hand? Record response on scoring form, then say, "What I want you to do is to put these pegs into the holes in this board. Notice that each hole and each peg has a groove along one side. To get the peg into the hole, you must turn the peg so the grooves will match, like this." Examiner then provides instructions as to how the holes are to be filled. The participant's DOMINANT HAND is to be tested first. For the performance with the participant's RIGHT hand say, "When I say GO, begin here (point to participant's upper LEFT corner and put the pegs into the board as fast as you can, using only your right hand. Be sure to fill in each row completely before moving on to the next row. In each row always fill the board the same way you filled the top row. This is a speed test so be sure to work as fast as you can. Do you have any questions? Ready, set, GO." For performance with the participant's left hand, instructions are the same except for: a) demonstrating placement of the first peg in participant's upper RIGHT corner, and b) demonstrating direction of movement from RIGHT TO LEFT for the first three rows. "When I say, GO, begin here (point to upper RIGHT corner) and put the pegs into the board as fast as you can, using only your left hand. Be sure to fill in each row completely before moving on to the next row. In each row always fill the board the same way you filled the top row. This is a speed test so be sure to work as fast as you can. Ready, set, GO." Discontinuation criterion for each hand is three minutes or completion of the board. Record on the scoring form the time for each hand and the number of pegs dropped with each hand.

(15) Grooved Pegboard Scoring Instructions

- (a) Fill in the demographic information at the top of the page. Record the participant's preferred hand (R or L) on the scoring sheet. Record preferred hand as a child. Write the total time (in minutes and seconds) to complete the task for each hand in the spaces provided. Record the number of dropped pegs for each hand. A peg is scored as dropped if it is dropped anywhere outside of the storage tray. At the end of the test, write the total number of drops in the space provided.

(b) The Grooved Pegboard Test is complete if both hands have been tested except when physical impairment precludes testing of one or both hands.

(16) Paced Auditory Serial Addition Test (PASAT) General Instructions

- (a) This test requires the participant to add numbers presented at a controlled rate. Numbers are presented to the participant by tape and the participant must add the newest number presented on tape to the number presented just previously. The participant would listen to the first number presented and then add that number to the second number presented and give the sum of the two numbers. He would then listen to the third number presented on the tape and add it to the second number. The fourth number is added to the third number presented on the tape and the fifth number is added to the fourth number presented on the tape, and so forth. If, for example, the tape presented the following numbers: 7...3...2...5...4, the participant would add 7 and 3 and say "10," then add 3 and 2 and say "5," then add 2 and 5 and say "7," and 5 plus 4, etc.
- (b) The test is divided into four sections and each section presents numbers at a faster rate than the previous section. Instructions must be comprehended by the participant prior to beginning the test. For this reason the use of visual cues demonstrating which numbers are added, and how to respond, is presented to the participant as well as a practice trial.
- (c) This test is continued until 50% of any series is failed or until the 4th series is completed, whichever occurs first. If the test is discontinued because of failure on a trial, it is considered complete.
- (d) If the participant seems to give up, encouragement is given; however, the tape should remain running unless the participant gives up completely.
- (e) While this test is poorly correlated with addition skills, a brief auditory addition section precedes the test to ensure that at least the basic skills required to perform this test are present. Administer the auditory arithmetic until five items are correct. If that criterion is not met within the ten practice items, discontinue the PASAT. Discontinuation after failure on the auditory addition section still constitutes a completed PASAT.

(17) Auditory Arithmetic of the PASAT

- (a) Say, "We are going to do some short arithmetic problems now. I will read you some numbers to add in your head and I want you to give me the answers. How much is $5 + 3$?"

How much is $7 + 5$?
How much is $9 + 6$?
How much is $4 + 7$?
How much is $8 + 4$?
How much is $4 + 2$?
How much is $7 + 6$?
How much is $3 + 5$?
How much is $6 + 8$?
How much is $4 + 5$?"

- (b) Administer this trial until five items are answered correctly or until all items have been administered without five correct answers.

(18) PASAT Participant Instructions

- (a) Say, "This test is very demanding and requires a lot of concentration. You really need to give me your very best effort. You will hear a man reading numbers on a tape, one at a time. You are going to be adding those numbers and telling me your answer as quickly as you can. This is how I want you to do it." "The man will say numbers like these one at a time. You are to add the first number you hear to the second number you hear and give me the sum (point to the diagram).
- (b) "The first answer, as you can see, would be '8.' As soon as you respond by saying '8,' listen for the next number on the tape. In this case, the next number is '7.' You must add this to the last number you heard on the tape, which was '3' and give me the sum...which is?" Allow participant to respond. If he adds the number to his previous answer, say, "No, the answer would be '10' because you add the newest number, '7,' to the last number you heard on the tape, or the number '3'."
- (c) Continue to demonstrate with the diagram until the participant seems to understand (four in a row correct). Then remove the paper and say, "Let's practice some." Present the numbers, going from the bottom of the practice sheet to the top. Allow the participant as much time as he needs to respond. Repeat any of the above instructions until the participant appears to grasp the idea of the test.

- (d) Say, "Now I will play the tape. The numbers are presented more quickly on the tape than we've been doing them, so respond as quickly as you can. If you get lost or frustrated, don't give up. Just do the best you can."
- (e) Proceed with the test. Introduce each new section by saying, "Now this section goes a little faster. Just do the best you can."
- (f) If the participant seems to be giving up or stops responding, say, "Keep going, you're doing fine" or, "Don't quit...keep trying." Be careful not to interrupt the participant. It is best to wait for three or four no responses before giving prompts.
- (g) Do not prompt with cues that might suggest a strategy (e.g. "Jump in wherever you are" or "Try the next one.")

(19) PASAT Scoring Instructions

- (a) Fill in the demographic information in the top left corner.
- (b) Responses are recorded on the answer sheet. An example of a partially scored PASAT is described and demonstrated below. The participant must respond prior to the presentation of the next number on the tape. If the participant responds correctly and within time, a check mark is placed on the left side of the participant's response column. If the response is incorrect, the number given by the participant is recorded on the right side of the participant's response column for that item.

PASAT SCORING PROCEDURES

ITEM #	CORRECT RESPONSE	P's RESPONSE	NOTATION
1	3	3	+
2	12	11	11
3	5	--	-
4	8	5 (from item 3)	5
5	6	8 (from item 4),6	8 6

- (c) If no response is given, a dash (-) is placed on the right side of the participant's response column.
- (d) If a response is given after presentation of the NEXT item (late response), a dash (-) is placed on the right (R) side of participant's column for the initial item and the participant's late answer response is written on the (R) side of participant's column for the NEXT item. Finally, if a wrong response is given but followed by the correct response before presentation of the next number, the wrong response is recorded then crossed out and a check (indicating correct response) is recorded.
- (e) Count the number right, number wrong, and number for which no answer was given for each series and write the sums in the appropriate score boxes. Blacken the corresponding circles for each of the three totals on each series attempted.

(20) WRAT-R General Instructions

This is a word reading test. The participant is instructed to read words one at a time and is scored on the correct pronunciation of each word. The participant is allowed 10 seconds to read each word. If a correct response has not been given within 10 seconds, the participant is instructed to go on to the next word and the missed word is marked wrong. The test is discontinued following 10 consecutive errors. Each word read correctly earns one point. If the participant obtains a score of 10 points or less in the formal reading part, he should be asked to read two letters in his name (written on the form) and to read the 13 capital letters printed above the word list. The participant receives 1 point for each letter correctly named. The total score for the pre-reading section is 15 points. If the pre-reading section is not administered, it is added (15 points) to the total score earned on the formal reading section.

(21) WRAT-R Test Participant Instructions

- (a) Say, "Look at each word carefully and say it aloud. Begin here (point) and read the words across the page so I can hear you. When you finish the first line, go on to the next line, and then the next, and so on." The first time a reading error occurs, the participant is asked to say the word again. The response is scored right if the participant corrects himself on the second trial. From then on, the first response is scored as either right or wrong, unless the participant spontaneously corrects the error he has made. If the

response is vague or not clearly scorable, the examiner may ask the participant to repeat the word. There should be no questioning or probing in regard to the correct answer.

- (b) If a score of 10 or less is obtained say, "Now I want you to tell me the name of this letter. (Point to first letter in participant's name which is printed on the test form.) Now this letter. (Point to the second letter of the participant's name.) Now tell me the names of these letters" (point to the letters printed above the words on the form).
- (c) To record the answers on the answer sheet, the Manual for the WRAT-R suggests the following procedure:
 - (i) Underline the first letter if the word is correctly pronounced. Example cat, cliff
 - (ii) Cross out the first letter if the word is mispronounced. Example: ~~c~~at, ~~c~~liff
 - (iii) If the participant first mispronounces the word, then corrects his error, cross out the first letter and underline the second letter of the word. Example: ~~c~~at, cliff. Score as correct.
 - (iv) If the participant first pronounces the word correctly, then mispronounces it, underline the first letter and cross out the second letter of the word. Example: c/at, c/~~l~~iff. Score as incorrect.

(22) WRAT-R Scoring Instructions

Each word correctly pronounced earns one point. If the pre-reading section is not administered, add 15 to the total number of words correctly read to yield a total raw score. If the pre-reading section is administered, each letter correctly identified earns one point, and the sum of points earned in the pre-reading section should be added to the sum of points earned in the reading section to yield the total raw score. The raw score and identifying demographic information should be entered on the front page of the WRAT-R scoring form and on the keypunch data sheet. The WRAT-R Reading Test is complete when it has been administered to 10 consecutive errors or when the end of the list has been reached.

(23) WAIS-R General Instructions

The instructions for administration and scoring of the WAIS-R subtests to be used in this study (Information, and Block Design) are described below. The only changes from Wechsler's scoring procedures will be to provide additional scoring on the Block Design responses where a separate score sheet for recording step by step reproductions of the subject's progress in constructing the designs will be provided. A minor administration change will also be made on Information. If the participant gives more than one response ask, "Which answer do you wish to say?" If the participant says, "nothing," or "don't know," code 0 (incorrect). The Information subtest will be introduced by saying, "On this test I'm going to ask you some questions. Just answer them the best you can."

(24) Information

The following directions for administration and scoring are quoted from the WAIS-R Manual (Wechsler, 1981):

- (a) Start with Item 5 and give credit for Items 1-4 if the participant passes both Items 5 and 6. If either Item 5 or Item 6 is failed, administer Items 1-4 before proceeding further.
- (b) Read each question exactly as stated. If the response to a question is incomplete or not clear, you may say, "Explain what you mean," or, "Tell me more about it," but do not ask leading questions or spell the words. Do not alter the wording of any question.
- (c) Record, verbatim, the participant's response to each item in the appropriate space on the Record Form.
- (d) Discontinue after 5 consecutive failures.
- (e) Score 1 point for each correct response. Essentials of acceptable answers are noted below. Where several acceptable answers are listed (separated by three dots), the participant need give only one to receive credit.
- (f) Maximum Score: 29 points (Wechsler, 1981, p. 59).

(25) Block Design

The following directions for administration and scoring are quoted from the WAIS-R manual (Wechsler, 1981):

- (a) The participant works directly from a block model (constructed by the examiner) for Design 1, and from printed cards for Designs 2-9.
- (b) In setting up models and presenting designs, the examiner should make sure that the designs are properly oriented. In the case of the cards bound in the booklet, present each design so that the unbound edge of the card is toward the participant.
- (c) When constructing the models for Designs 1 and 2, observe the same orientation; that is, the edge of the model corresponding to the unbound edge of the card should face the participant. To prevent the participant from looking at the side of the block design instead of at the top, construct the model so that the participant is required to look down on it. (When the directions to the subject have been given, the examiner should move the block model to a point approximately seven inches from the subject's edge of the table. If the subject is right-handed, the model should be placed a little to the left of a line perpendicular to the subject's body; to the right if the subject is left-handed. It is important for the examiner to see that the subject is seated facing the edge of the table).
- (d) In laying out the blocks for the participant to use, the examiner should make sure that a variety of surfaces face up, that only one out of the four blocks has the red/white side facing up, and only three when nine blocks are used.
- (e) The time limit allowed for each design is shown in the Record Form. Timing for each attempt begins when the last word of the directions is given. For Designs 1 and 2, begin timing again if the participant is given a second trial. Record the exact time the participant takes to complete each design, if it is within the time limit. Accurate recording is essential for Designs 3-9 since bonus points are allotted for quick, perfect performance on these designs.
- (f) An item is failed if the participant's design either is faulty (i.e., does not match the model precisely) or is not completed in the allotted time. If on the first trial of Designs 1 or 2, the time limit expires before the design is finished, stop the participant and give a second trial.
- (g) Rotation of a design by 30 degrees or more is considered a failure.

(h) If such a rotation occurs on any design, score it as a failure, and correct the participant the first time it happens by saying, "But, you see, it goes this way," and rotate the blocks to the correct position. However, this correction may be given only once during the test. Should a rotation occur for the first time on the first trial of Designs 1 or 2, correct it, scramble the blocks, and ask the participant to make the design again. If the first rotation occurs on the second trial of Designs 1 or 2, or on a later design, make the correction and then proceed to the next design.

(i) Design 1

(i) Take four blocks and say, "You see these blocks? They are all alike. On some sides they are all red; on some, all white; and on some, half red and half white." Turn the blocks and show the different sides. Then say, "I am going to put them together to make a design. Watch me."

(ii) Arrange the four blocks slowly into the design shown on Card 1, without exposing the card to the participant. Then, leaving the model intact, give four other blocks to the participant and say, "Now make one just like this." Start timing, and allow 60 seconds. If the participant successfully completes the design within the time limit, proceed to Design 2.

(iii) If the participant fails, say, "Watch me again." Demonstrate a second time, using the participant's blocks. Afterward, scramble the blocks, but leave the examiner's model intact and say, "Now you try it again and be sure to make it just like mine." Start timing again, and allow 60 seconds. Whether the participant succeeds or fails on the second trial, proceed to Design 2.

(iv) Occasionally a participant will try to duplicate the examiner's model exactly, including the sides. If this occurs, tell the participant that only the top needs to be duplicated.

(j) Design 2

(i) Scramble the participant's blocks. Remove the blocks that served as the model for Design 1 and put in their place the card marked "2." Say, "This time we are going to put the blocks together to make them look like this picture." Point to the card with Design 2 and say, "Watch

me first." Construct the design slowly, using the participant's blocks, and when finished say, "You see, the tops of these blocks look the same as this picture." Scramble the blocks used in the demonstration and say, "Now look at the picture and make one just like it with these blocks. Go ahead." Allow 60 seconds. If the participant successfully completes the design within the time limit, proceed to Design 3.

- (ii) If the participant fails, scramble the blocks and say, "Watch me again." Make the design again; then scramble the blocks and say, "Now try it again." Allow 60 seconds. Whether the participant succeeds or fails on the second trial, proceed to Design 3.

(k) Designs 3-9

- (i) Scramble the blocks. Place the card for Design 3 before the participant and say, "Now make one like this. Try to work as quickly as you can. Tell me when you have finished." Start timing and allow 60 seconds. When the participant has finished the design or at the end of the time limit, scramble the blocks. No second trials are given on Designs 3-9. Present the remaining designs by saying, "Now make one like this. Try to work as quickly as you can. Tell me when you have finished." (These instructions may be shortened when the participant clearly understands what to do.) Start timing and allow the specified number of seconds.

- (ii) When Design 6 is reached, take the other five blocks out and say, "Now make one like this, using nine blocks. Be sure to tell me when you have finished." For Design 9, do not permit the participant to rotate the card to give the design a flat base.

Time Limits for Block Design

Design	Time Limit
1-2	60" (time each trial separately)
3-5	60"
6-9	120"

- (iii) Discontinue after 3 consecutive failures. (A two-trial design is considered failure only if both trials are failed.)

(1) Scoring:

- (i) Design's 1-2: 2 points for passing on the first trial; 1 point for passing on the second trial.
- (ii) Design's 3-9: 4 points for each design successfully completed within the time limit, plus a maximum of 3 bonus points per design for quick performance. No credit given for partially correct or incomplete performance (Wechsler, 1981, pp. 72-74).
- (iii) The specific features that the technician should note with each block placement are indicated in the series of empty boxes on the right side of the page. Thus, a construction with four separate block placements (the minimum number) is represented in four vertically arranged rows, in order to unambiguously demonstrate flotation. On the actual answer sheet, of course, all these features will be noted on a single, horizontal row of empty boxes, as represented in the bottom row.
- (iv) In example A (on scoresheet), each block the participant placed was correct. The order of block placements is indicated in the order box by the numbers 1-4. The total time to completion (14 seconds) is recorded and an "OK" or a 'P' (for pass) is placed in the last scoring box.
- (v) In example B (on scoresheet), the participant made two errors, though ultimately achieved a correct solution. The first row indicates the correct placement of the first block. The second row shows how the first error (the second block placed) will be recorded. A "2" is placed in the appropriate position in the order box, the actual error is noted in the first error box, and the time the error was made is noted below the first error box. The next block placement, shown in row 3, was also an error. Since there is an empty space in the first error box in that position the actual error is drawn there. No time entry is made. The participant then corrected his first mistake, as shown in row 4. This correction must be drawn in the second error box because an entry in that position has already been made in that position in the first error box. The time the correction is made is recorded. Next, the participant correctly placed the fourth block, as shown in row 5. An

entry is made in the order box. Finally, in row 6, the subject corrects the second error and correctly completes the design. The correction is indicated in the second error box, and the total time to completion is recorded.

- (vi) Example C (on scoresheet), demonstrates an incorrect solution. The first block is placed correctly (row 1), but the second block (row 2) is an error and is recorded as indicated in the previous example. The participant then changes the second block placed (row 3), but it is still an error. The precise error is indicated in the second scoring box effective of the the error again noted. The third block placed (row 4) is correct, as is the fourth (row 5), which completes the participant's design. The final, incorrect solution is drawn in the last error box and the time to completion is noted.
- (vii) In example D (on scoresheet), an incorrect solution with broken configuration is provided. The first block placed is incorrect. At this point, however, the examiner has no way of knowing which of the four blocks this error was intended to represent. The examiner should, at this time, record the time at which this error was made under the first error block. The examiner should wait, however, until the second block is placed to note the location of that block in the order box and the nature of that error in the first error box. The placement of the second block will often allow the examiner to understand the intended position of the first block. The third block placed (row 3) breaks the square configuration of the design and thus requires the examiner to draw an additional box onto the first error box, and to note the exact error in that newly drawn box. The examiner must make a similar addition to the order box, as shown in row 3. Row 4 shows that the fourth block placed was also an error, and this is also recorded in the second error box. The participant's last move is indicated in row 5 and involves the changing of the position and design of the block that was placed third. This is indicated in the next error box with the time of the error. The total time is then recorded, and the incorrect solution drawn in the final empty box.

(viii) Occasionally, the position of the second block may not reveal the intended location of the first block (an error), as was demonstrated in example D. In example E (on scoresheet), the second block placed provides no help in establishing the intended location of the first block. As before, the examiner records the time of the first error, but waits until the second block is placed to determine location. After the second block is placed the examiner must record the block arrangement, as to wait further would likely mean that the examiner may miss future block placements while trying to record everything that had previously transpired. The examiner thus must take a guess, and in this example, he decided to record the first two blocks as representing the participant's left (the examiner's right) side of the design. All scoring from here on proceeds as described before. Had the examiner decided the first two blocks would be scored as representing the participant's right side of the design, the next block placed, as shown in row 3, would have necessitated drawing an extra box, as this error would have entailed broken configuration. The block shown as placed in row 4 would NOT then have required drawing an additional box, as it did in the example shown.

(26) Additional Scoring of Block Design

- (a) In scoring additional features of the Block Design, four factors are noted: 1) order of design assembly, 2) errors in assembly of design, 3) assembly time, and 4) correctness of the final design.
- (b) The order in which the blocks are placed together to assemble the design is recorded on the score sheet in Box 1, the box just to the right of the presented design. If changes in assembly occur, DO NOT change original order recorded. Allow the participant's first order to stand. When two blocks or more are placed together simultaneously, give them the same number. For example, in the following diagram, the top two blocks were placed simultaneously, after each of the lower two blocks.



- (c) If the final design is completely correct, with no errors, an OK or a 'P' for "pass" is placed in the final results box. The time to completion is recorded.
- (d) Additional information is recorded only when the participant makes an error, whether enroute to a correct final solution or in the final solution itself. An error occurs when the participant places a block incorrectly (e.g., places an all red block where an all white block belongs). The first time an error occurs it is noted in the first box after the order box (i.e., the second blank box). The time in seconds of the error is also noted. Subsequent errors of other blocks are noted in this same box until the participant changes a previously placed block. This change can either be the incorrect placement of a previously correct block, the correction of a block previously placed in error or a previously wrong block placed wrong again. This change and the time of this change are then noted in the next available error box. Then continue with the second box until another block in that box is changed (i.e., continue until one cannot make an entry in that block in the desired location because an entry has already been made in that location). An exception to the rule that only errors are recorded in the boxes occurs when the participant changes a correctly placed block to an incorrect position. The correct placement is noted in the appropriate box then the change to incorrect is noted in the next block in order to reflect the sequence of placement.
- (e) There are three boxes available to note errors and their changes; therefore, if any block is placed in the design and changed more than three times, only the first three changes can be recorded. Nothing else will be recorded until the participant completes the design. The completed design is then sketched in the final result box.
- (f) When recording errors in the error boxes, the following symbols are to be used: for an all white block, place a "W" in the box; for an all red block, place a dot in the box; for a half red and half white block, place a diagonal line in the block with a dot noting the red half; and leave the box blank for any missing block.
- (g) When a participant breaks the design matrix (that is, places blocks outside the 2 x 2 or 3 x 3 design matrix), write the order number in the position of the order box where the block WOULD be if the matrix were enlarged. Then draw the additional squares onto the error matrix to show the actual design placement.

- (h) When the matrix is completely changed to an extent that it cannot be redrawn around the existing error boxes (i.e., some blocks are placed obliquely), sketch the design in the small empty space below the number.
- (i) When the participant makes the first assembly error, the time of that error is observed on the stopwatch and recorded under the first error box. For further errors noted in that box, no times are recorded. When the next change of a previously placed block occurs, the time is again observed from the stopwatch and recorded below the second error box. Again, for other changes recorded in this box, no times are noted. If any previously placed block is then changed a third time, the time is again observed on the stopwatch and recorded under the third error box. Times of further changes in previously placed blocks are NOT recorded. The time it takes the participant to completely assemble each design is recorded under the final result box and in the lower-left corner of the score sheet.
- (j) When the participant has completed the design or the maximum time allowed has elapsed (whichever comes first), score the final design.

(27) Diagnostic Interview Schedule

- (a) This test is a structured interview that averages 66 minutes in the normal population.

b. Group Administered Tests

Descriptions of procedures for each test are as follows. To ensure quality control, technicians will monitor group testing on a rotational basis. Further, all score sheets are to be checked to ensure correctness of demographic information and complete bubble marking.

(1) Army Classification Battery

This is a classified test with some of the items related to tests currently used by the United States Armed Forces and as such is restricted from being included in this manual. All technicians will receive training for administration as stated in the actual test instructions.

(2) Edinburgh Handedness Inventory

- (a) This inventory determines the frequency with which each participant uses his right and/or left hands in routine tasks. The technician will hand the forms out FACE DOWN.

(b) Instructions to Participants for Handedness Inventory

"I am handing out the next test now and I want you to leave it face down on the table until I ask you to turn it over." Finish handing out the test. "Now, turn the test over. This is an inventory examining hand use preference. I will read it aloud. Please answer each question by placing a check in the appropriate box." (Instructions on the top of page.)

(c) Scoring for Edinburgh

This test generates a laterality quotient (LQ). It is computed by the formula $\frac{R-L}{2} \times 100 = LQ$. It will be computed by CDC after data are transmitted.

(3) Minnesota Multiphasic Personality Inventory (MMPI)

- (a) This test requires that the participant answer 560 True/False questions that are descriptive of how he is/feels about himself/believes at the present time. See Section 7 for instruction to participant for the MMPI.
- (b) Scoring of the MMPI will be completely handled through the CDC.

(4) Combat Exposure Index

- (a) This test examines varying degrees of combat-related experiences.
- (b) Before administering the DIS, the technician will check to see if the participant required an audiotape for the MMPI. If so, the CEI will be administered by audiotape. Hand the participant the combat exposure index and ask him to complete it, providing him with a written test if he reads at a level of 6E or higher. Otherwise, provide him with a CEI audiotape in the tape recorder and a headset. When the test is complete, review it to make sure there are no missing responses. Question the participant about missing responses to determine if they are errors or intentional omissions. If they are intentional omissions, determine if they are refusals or "don't know." The criterion for completion of the CEI is at least nine items not refused (can be answered or "don't know"). Fill in comments section for refusals and "don't knows."

(c) Written instruction for the CEI are: "The questionnaire asks about some experiences you may have had while in the service/Army. Please answer each question as it best fits your experience."

10. References

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V. Psychological Examination Manuals

B. Diagnostic Interview Schedule (DIS)

This manual is designed as a training tool for the National Institute of Mental Health Diagnostic Interview Schedule as used in the Lovelace Veterans' Health Study. This version of the DIS is adapted from the Diagnostic Interview Schedule III. The manual is meant to be used in conjunction with supervision as part of a two-week DIS training period.

Part I: Overview

A. History and Scope of the DIS

From the DIS, version III-A,
Training Manual, St. Louis, MO Robins, 1985.

Development of the National Institute of Mental Health Diagnostic Interview Schedule (DIS) began in 1978 at the request of the National Institute of Mental Health (NIMH). The NIMH Division of Biometry and Epidemiology was beginning to organize its Epidemiology Catchment Area (ECA) Program and needed a comprehensive diagnostic instrument which could be administered either by lay interviewers or by clinicians for a large scale, multi-center epidemiological study.

A major goal of the ECA program was to conduct population surveys in various parts of the United States that would, for the first time, ascertain the prevalence and incidence of specific psychiatric disorders. Large samples were required to provide accurate estimates. Large samples also meant relying on lay interviewers.

Because the Diagnostic and Statistical Manual, Third edition, (DSM-III), published by the American Psychiatric Association in 1980, was to be the official diagnostic system for the country, it was desirable for DSM-III to be at least one of the bases for these prevalence counts. While there would be no attempt to cover all DSM-III diagnoses, as many of the major diagnoses would be covered as could be handled in a one-hour interview.

To make the selected DSM-III diagnoses, a diagnostic interview had to identify on an historic (lifetime) basis the presence and clinical significance of all symptoms in the DSM-III operational criteria, the frequency and severity of symptoms, temporal clustering of symptoms, whether symptoms occurred in the absence of circumstances under which they would be part of a normal emotional response, whether symptoms occurred in the absence of physical illnesses or conditions which could account for them, and the presence of other psychiatric disorders which might preempt the disorder of interest. None of the interviews which had been used previously in surveys of the general population performed all these tasks in a standard replicable fashion. The NIMH staff reviewed four existing interview instruments - Present State Examination (PSE), Psychiatric Epidemiological Research Interview (PERI), Schedule for Affective Disorders and Schizophrenia (SADS), and Renard Diagnostic Instrument (RDI) - and then met with their authors and users to determine

which, if any, of the instruments would be applicable to the ECA project. The RDI came closest to meeting the specifications for the new instrument, although it did not, of course, cover all the criteria in DSM-III, which was still in draft at that time. The developers of the RDI, the Washington University group, were given primary responsibility for developing the new instrument. They preserved specific questions and probes from the RDI and its detailed coding scheme, while adapting it to make distinctions between current and past diagnoses and to make diagnoses by Feighner, RDC, and DSM-III criteria. The DIS is the result of these adaptations and modifications of the RDI.

The NIMH Diagnostic Interview Schedule draws on three separate, but related interview traditions. One is a tradition of surveys using interviews developed from existing paper and pencil tests that had been used on very large samples, particularly the MMPI, its offspring the Army Neuropsychiatric Screening Adjunct, and the Cornell Medical Index. These interviews include the Health Interview Survey (HIS), the Health Opinion Survey (HOS), the Structured Interview Schedule (SIS), and Psychiatric Epidemiological Research Interview (PERI). They count the 'mentally disordered' but do not provide specific diagnoses.

The second tradition is one of formalized clinical interviews. It began with epidemiological studies carried out by Scandinavian psychiatrists. These studies were performed either by a single psychiatrist or by a group of psychiatrists working closely together in a small community well known to them personally. These psychiatrists themselves attempted to interview key informants and community members to judge which community residents were psychiatrically-disordered and what their diagnoses might be. Symptoms to be investigated were specified, but specific questions for eliciting them were not written out. The psychiatrist often spoke with relatives and the local doctor as well as the subject himself, when he was available. He then pooled information from these sources to reach a diagnostic decision, the rules for which were not specified in detail. While there was presumably little difficulty with reliability, there was a problem of comparability in such studies. Consequently, practitioners developed more standardized instruments which included the Present State Examination (PSE, 1974) and the Psychiatric Status Schedule (PSS, 1979).

A common misconception is that a classification of mental disorders classifies individuals, when actually what are being classified are disorders that individuals have. For this reason, the text of DSM-III avoids the use of such phrases as a "schizophrenic" or "an alcoholic," and instead uses the more accurate, but admittedly more wordy "an individual with Alcohol Dependence."

Another misconception is that all individuals described as having the same mental disorder are alike in all important ways. Although all the individuals described as having the same mental disorder show at least the defining features of the disorder, they may well differ in other important ways that may affect clinical management and outcome.

Conditions Not Attributable to a Mental Disorder. In DSM-III it is recognized that a behavioral or psychological problem may appropriately be a focus of professional attention or treatment even though it is not attributable to a mental disorder. A limited listing of codes, taken from the V codes section of ICD-9CM, is provided for noting such problems.

Descriptive Approach. For some of the mental disorders, the etiology or pathophysiological processes are known. For example, in the Organic Mental Disorders, organic factors necessary for the development of the disorders have been identified or are presumed. Another example is Adjustment Disorder, in which the disturbance is a reaction to psychosocial stress.

For most of the DSM-III disorders, however, the etiology is unknown. A variety of theories have been advanced, buttressed by evidence (not always convincing) to explain how these disorders come about. The approach taken in DSM-III is atheoretical with regard to etiology or pathophysiological process except for those disorders for which this is well established and therefore included in the definition of the disorder. Undoubtedly, with time, some of the disorders of unknown etiology will be found to have specific biological etiologies, others to have specific psychological causes, and still others to result mainly from a particular interplay of psychological, social and biological factors. The major justification for the generally atheoretical approach taken in DSM-III with regard to etiology is that the inclusion of etiological theories would be an obstacle to use of the manual by clinicians of varying theoretical orientation, since it would not be possible to present all reasonable etiological theories for each disorder. For example, Phobic Disorders are believed by many to represent displacement of anxiety resulting from the breakdown of defensive operations for keeping internal conflict out of consciousness. Other investigators explain phobias on the basis of learned avoidance responses to conditioned anxiety. Still others believe that certain phobias result from a dysregulation of basic biological systems mediating separation anxiety. In any case, as the field trials have demonstrated, clinicians can agree on the identification of mental disorders on the basis of their clinical manifestations without agreeing on how the disturbances come about.

Because DSM-III is generally atheoretical with regard to etiology, it attempts to describe comprehensively what the manifestations of the mental disorders are, and only rarely attempts to account for how the disturbances come about, unless the mechanism is included in the definition of the disorder. This approach can be said to be "descriptive" in that the definitions of the disorders generally consist of descriptions of the clinical features of the disorders. These features are described at the lowest order of inference necessary to describe the characteristic features of the disorder. Frequently the order of inference is relatively low, and the characteristic features consist of easily identifiable behavioral signs or symptoms, such as disorientation, mood disturbance, or psychomotor agitation. For some disorders, however, particularly the Personality Disorders, a much higher order of inference is necessary. For example, one of the criteria for Borderline Personality Disorder is "identity disturbance manifested by uncertainty about several issues relating to

identity, such as self-image, gender identity, long-term goals or career choice, friendship patterns, values and loyalties."

This descriptive approach is also used in the division of the mental disorders into diagnostic classes. All of the disorders without known etiology or pathophysiological process are grouped together on the basis of shared clinical features.

The subdivision of each diagnostic class into specific disorders, with even further subdivision in some cases, reflects the best judgment of the Task Force and its Advisory Committees that such subdivision will be useful. In this regard we have been guided by the judgments of those clinicians who will be making most use of each portion of the classification. For example, the subdivision of Psychosexual Dysfunctions into seven specific disorders is in response to the expressed needs of clinicians who specialize in the treatment of these conditions. (It soon became apparent that the criticism that a subdivision in a particular area of the classification was useless always came from clinicians who specialized in other areas.) It should be noted, however, that the judgments of clinicians concerning the necessity for including new categories were not accepted uncritically. Although initially many new categories were added in an effort to be inclusive, experience in the field trials and lack of validity evidence from the literature resulted in the elimination of several proposed categories.

Systematic Description. The text of DSM-III systematically describes each disorder in terms of current knowledge in the following areas: essential features, associated features, age at onset, course, impairment, complications, predisposing factors, prevalence, sex ratio, familial pattern, and differential diagnosis. Although descriptively comprehensive, DSM-III is not a textbook, since it does not include information about theories of etiology, management and treatment. It should also be noted that the DSM-III classification of mental disorders does not attempt to classify disturbed dyadic, family, or other interpersonal relationships.

Part II. Administration of the DIS

A. Overall Process

The technician introduces and administers the interview. Following this, the Participant Contact form and the Combat Exposure Index are explained and completed. After completing the interview, the technician should field edit looking for missed questions and inconsistencies in answers. Attempts should be made to correct any problems in the interview before the participant leaves the testing site to reduce the number of telephone data retrievals. Information which would be useful for the psychologists' Results Interviews should be noted on the participant's Individual Results Validity form. The interview is then taken to the editors. The editing process consists of a first edit, technician review if mistakes were found, a re-edit of technician corrections, key punching of the data onto computer disk and a computer cleaning. At that point it is sent to medical records. If the interview was taped, then an additional second edit is added to the procedure. Technicians tape every tenth interview to monitor standards.

Supplies:

1. Orange pencils or pens
2. DIS
3. Participant Contact form
4. Combat Exposure Index (see Psychology Manual)
5. Probe Flow Chart
6. Drug list

Duration of Interview: The DIS is designed to be completed in a single session lasting about one hour. Respondents who are very talkative or have many symptoms require a greater amount of time. Usually the interview is sufficiently interesting to such respondents that they tolerate a duration of two to three hours well. If necessary, the interview can be completed in a second session. When this occurs, the interviewer notes what question he ended with, the time the first session was terminated, and the time the second session began on the front page of the interview.

Respondents: The DIS is designed for respondents who are 18 years of age or older. It was written in language appropriate for persons with markedly different educational backgrounds and intelligence. It is simple enough that respondents with less than a 6th grade education can respond meaningfully to the questions; yet it does not patronize those with higher levels of education.

Interviewers may encounter respondents who do not appear able to give meaningful answers. In this case, the interviewer is to complete the interview and write appropriate notes to the psychologist on the participant's Individual Results Validity form.

B. Notes to Psychologists On Individual And Group Validity Forms

The technicians should be aware that the participant data charts are similar to hospital charts. It is in "bulletin board" style where a variety of people "stick-up" notes and a variety of people read them. It should also be kept in mind that the participant may some day read the chart so notations should be factual and behavioral. Personal opinions are to be avoided. Notations should be legible, brief and clear. Focus on how the participant acts and/or what he says. When it is possible, use behavioral data and quotations, not interpretations. Use of the shorthand abbreviations that are presented here will save both the tech and the psychologist time and effort.

The following are categories of information that are especially helpful to the psychologist for the results interviews:

a. Historical

1. Any psychological hospitalization or treatment.
2. Medications and how long.
3. Divorce/separation and time frame.
4. Death of children.
5. Particularly bad combat events.
6. Other traumatic events; i.e., prison.
7. Past heavy alcohol/drug use and treatment.

b. Current

Adjustment disorders:

1. Divorce - especially if children are involved.
2. Money/job problems; i.e., unemployment, dissatisfaction, demotion, lack of advancement.
3. Illness.
4. Recent death.
5. Parent/child problems.
6. Current alcohol/drug problems.
7. Anhedonia (lack of pleasure response).

Shorthand

<u>S</u> - subjects	<u>P</u> -- participant
<u>E</u> - experimenter	<u>T</u> -- tech
c/o - complains of	c -- with
Hx - history	S -- without
Tx - treatment	w/o -- without
Rx - prescription drugs	c - psychology
ETOH- alcohol	O - increase
INPT- inpatient	o - decrease

Example: P c/o depression. Hx inpt Tx. 2x '75,'81.
Participant complains of depression. Has a history of inpatient psychological treatment, two times - in 1975 and 1981.

Remember not to draw conclusions or make diagnoses. Use the P's behavior and verbal statements to describe him. If there were no problems, then

make a note of that. This helps the psychologists also. Such statements as "reported no current problems" for the DIS, or "P was friendly and cooperative" for the neuro battery are appropriate.

C. Manual Editing Procedures for DIS During Veterans' Health Study

Step 1 - Field Edit by Interviewer

- 1) Field edit as soon as possible after the interview. Check especially for consistency among responses to recency, Qs, time spans of symptoms, and number of spells. Also, check carefully any sections of the DIS answered by P that are not frequently administered.
- 2) Write the participant number and your initials in the upper right corner of the DIS envelope.
- 3) Place the DIS envelope in your designated hanging file in the TO BE EDITED drawer.

Step 2 - Manual Edit by Editors

- 1) Untaped interviews are edited once. If no errors are found, they are sent directly to Data Processing for keying. If any errors are found, the DIS is placed in the Edited Tech Review Drawer.
- 2) Taped interviews are listened to by an editor and then re-edited. All taped interviews will be returned to the tech via the Edited Tech Review Drawer.
- 3) Cases Awaiting Edit Decisions-Cases are not returned to the interviewer until edit decisions are made.
- 4) Second Edits-Cases are not returned to the interviewer until second edits are completed.

Step 3 - Corrections Review by Interviewer

- 1) The interviewer should check the EDITED - TECH REVIEW drawer on a daily basis, and review all corrections, including those questions already corrected by the editor.
- 2) Be CERTAIN to check the CORRECTED BY column of the Edit Sheet. If the editor has not initialed the editor (ED) box for an error, then the interviewer must make the necessary corrections IN GREEN PENCIL in the DIS booklet and initial the interviewer (INT) box of the CORRECTED BY column on the Edit Sheet.
- 3) If the editor has corrected the mistake place a check mark in green pencil in the Interviewer Box. All edit sheets should be initialed in upper left hand corner and dated in green pencil.

Step 4 - Tech then puts corrected DIS in re-edit drawer.

Step 5 - Corrected Interviews Checked by Editor Re-Edits. An editor then reviews all corrections.

Step 6 - Transmittal of DIS to Data Processing for Keying

D. Procedures For Data Retrieval

- 1) Before calling, locate question in DIS that needs to be asked. Review possibilities of asking additional questions due to the data retrieved.
- 2) Procedure for calling is to use a Lovelace line on any of the phones. Then dial 9, then 1 plus area code and number.
- 3) Identify yourself as "name" from Lovelace Medical Foundation. Do not say it is the Veterans' Health Study, unless you are sure you are talking to the participant.
- 4) When you talk to the participant, remind him that you are from the psychology portion of the study and you were the one who administered the long interview. Tell him you need to ask some questions and ask if this would be a convenient time. If so, ask questions and code them in green. Check or recode any questions that may be affected by the new data. To the left of the questions asked, write DR, the date, and your initials. Also write DR, the date, and your initials on the edit sheet in the area for explanation. In addition, initial the interviewer box on edit sheet. Then put DIS in third drawer of editor file (re-edits).
- 5) If participant is not home, try to find out when you can call him back. If he is difficult to reach, leave a message for him to return the call. The number to give the participant is 1-800-843-8387, ext. 7687. Tell the participant to ask for an editor. Then rubberband your DR record sheet to outside of envelope and put it in your designated hanging file in the EDITED-TECH REVIEW drawer. Continue to attempt contact if P does not return call within two days.
- 6) Be sure to document all attempts to contact the participant on the Data Retrieval Sheet including date, time contacted and response.

E. Introduction to DIS

The following statement is used to introduce the interview to the participant:

DIS INTRODUCTION

IN THIS INTERVIEW I'LL BE ASKING YOU QUESTIONS THAT MAY OR MAY NOT APPLY TO YOU. THE INTERVIEW IS STANDARDIZED AND I'LL NEED TO ASK ALL OF THE QUESTIONS. PLEASE ANSWER AS CLEARLY AS YOU CAN. THESE QUESTIONS APPLY TO ANY TIME IN YOUR LIFE INCLUDING YOUR MILITARY EXPERIENCE. SOMETIMES I MAY ASK IF YOU TOLD DOCTORS ABOUT SYMPTOMS AND I'LL MEAN DOCTORS YOU TOLD

BEFORE COMING TO THE STUDY. SOME OF THESE QUESTIONS MAY BE DIFFICULT TO UNDERSTAND. PLEASE ASK ME TO CLARIFY ANY QUESTION. ALL YOUR ANSWERS ARE CONFIDENTIAL.

ADDITIONAL INTRODUCTORY STATEMENTS:

1. When administering the DIS in the observation room, add the following to the DIS introduction, or if the participant asks, right away:

"AS PART OF THE QUALITY CONTROL FOR THE STUDY, WE MAY BE OBSERVED BY MY SUPERVISOR TO MAKE SURE THAT I AM DOING THE INTERVIEW CORRECTLY."

2. When audiotaping the DIS for quality control, explain to the participant:

"AS PART OF THE QUALITY CONTROL FOR THE STUDY, IT IS NECESSARY TO TAPE INTERVIEWS PERIODICALLY. I WOULD LIKE TO TAPE THIS INTERVIEW IF YOU DO NOT OBJECT. IT WILL BE USED BY SUPERVISORS TO INSURE THAT THE INTERVIEW IS BEING ADMINISTERED CORRECTLY."

3. If administering the DIS in one of the video rooms, explain to the participant:

"THIS ROOM HAS A VIDEO CAMERA IN IT, AND THIS TEST MAY BE TAPED FOR QUALITY CONTROL. THE CAMERA IS BEHIND YOU. IT IS FOCUSED ON ME TO MAKE SURE I AM ADMINISTERING THE INTERVIEW CORRECTLY. IF WE ARE TAPED, THE TAPE WILL BE USED ONLY FOR SUPERVISION. IT WILL BE ERASED WHEN MY SUPERVISORS HAVE COMPLETED THEIR REVIEW, AND IT WILL NOT BE KEPT AS PART OF THE DATA. DO YOU OBJECT TO VIDEOTAPING OF THIS INTERVIEW?"

If the participant objects to videotaping, tell the Lead Technician or person in charge, and unplug the camera.

F. How To Ask DIS Questions

All questions should be read exactly as they appear. If a respondent answers irrelevantly or does not appear to understand the question, the whole question or that portion which is not understood should be read to him again, emphasizing the words he seems to have misunderstood. The question should not be rephrased unless rereading it slowly and clearly fails to enable the respondent to understand it. The DIS questions have been tested extensively. It is better to repeat them than to improvise rephrasings on the spot, because the improvisation may inadvertently change the meaning.

Respondents may interrupt the interviewer and answer before having heard the whole question. When this happens, the question should be read again, making sure the respondent hears it through to the end. The interviewer should not assume a premature response applies to the question as written.

Some respondents have trouble with long questions. If necessary, long questions can be broken into a series of shorter questions, making sure

that all the parts are covered and that the respondent understands the question as it was originally written.

Asking questions as written is important, but no more important than listening carefully to answers. Respondents sometimes respond to what they thought the interviewer was about to ask, imagining a question that includes a key word that caught their attention. Listening carefully to their answers will help detect this type of misunderstanding.

Interviewers must remember that a response is not always an answer. An answer is obtained only when the respondent understands the intent of the question and has responded appropriately.

If a respondent appears to contradict what he said earlier, the interviewer should express neither dissatisfaction nor disbelief, but should ask for clarification of the discrepancy and revise the coding of the previous or current response if necessary.

Some DIS questions are personal and potentially embarrassing for both the interviewer and the respondent. To reduce the risk of embarrassment, all questions should be asked in a matter-of-fact way and in private. Even if the respondent says he has nothing to hide from a spouse, friend, or relative, the interviewer should insist on administering the interview privately and point out that the respondent is free to share whatever he chooses to afterwards. This applies to data retrieval by phone as well (discussed more thoroughly below).

Managing Questions to Which the Answer Has Been Volunteered Earlier:

In the course of answering a question early in the interview, a respondent may volunteer information that answers a later question as well. If the interviewer reads the later question without acknowledging what was said earlier, he or she might encounter either of the following situations:

The subject may be annoyed at being asked a question which was already answered, thinking the interviewer was not listening earlier. In this case, the respondent may answer, "I already told you," which would not be sufficient for the interviewer to determine the proper code.

OR

The respondent may assume the interviewer was listening earlier and so interpret the later question to mean, "Were there other instances or examples besides those you told me about earlier?" If there were no further instances, the respondent may answer "No," appearing to be denying the previous positive answer.

To avoid both errors, the interviewer must remember volunteered information that will be relevant to later questions. When the interviewer reaches the later question, the interviewer should remind the subject of his previous answer by saying, "I know you told me before that (-----). But I still need to ask you this question as it is written." This phrasing

2) R: I was only out of work 5 weeks.

0 1
MONTHS

There are also blank lines in which the interviewer is asked to enter responses to open-ended questions and examples of symptoms. These are used by editors in reviewing the answers to precoded questions or to allow review by a physician to check a lay interviewer's decision as to whether a symptom was probably correctly attributed to physical causes. It is not necessary to code verbatim responses for entry into the computer, because they are not used by the diagnostic programs.

An answer for every question is entered, unless there are instructions to SKIP.

Generally, the answer to each question is entered immediately, before the next question is asked. However, sometimes more than one question must be asked before coding. This happens in two situations:

- a) when the Probe Flow Chart is to be used, as indicated by a horizontal listing of codes (additional information later); or
- b) when there is a specific instruction in the interview to delay coding until a second question has been asked.

Example:

121. Have you ever believed that someone was reading your mind?

INTERVIEWER: IF NO, CODE 1, ALL OTHERS ASK A. /

A. Did they actually know what you thought or were they just guessing from the look on your face or from knowing you for a long time?

INTERVIEWER: IF "JUST GUESS" CODE 1. OTHERS /
ASK FOR AN EXAMPLE AND BEGIN PROBING. /

EX: _____

MD: _____ SELF: _____ 1 2 3 4 5

The available codes for precoded questions are printed on the DIS in both vertical and horizontal patterns:

Vertical Coding Patterns

Codes for yes-no responses or where one of a list of possible answers is to be selected are listed vertically.

EXAMPLE: Q.4 Are you presently married or are you widowed, separated, divorced, or have you never been married?

MARRIED.....1
WIDOWED.....(SKIP TO Q.6)....2
SEPARATED.....(SKIP TO Q.6)....3
DIVORCED.....(SKIP TO Q.6)....4
NEVER MARRIED...(SKIP TO Q.6)....5

EXAMPLE: Q.5 Are you currently living with your (husband/wife)?

NO.....1
YES.....(SKIP TO Q.7)....5

H. Standard Horizontal Symptom Coding Patterns

For symptom questions, the DIS uses a set of standard codes (1 2 3 4 5) presented horizontally. The proper code is selected via responses to the Probe Flow Chart to be discussed below. No interpretation of the codes is provided beside the question.

. The standard codes mean:

- "1" The respondent has never had this symptom or doesn't remember having it.
- "2" The respondent has had the symptom. However, the symptom was always so mild that the respondent did not seek professional help, did not take medication for it more than once, and did not feel that it interfered with his or her life a lot. Thus, the symptom is considered below clinical significance. When a symptom is intrinsically of clinical significance because of its serious nature (e.g., Q.89, a suicide attempt), a number "2" code is provided as a coding option.
- "3" The respondent has had the symptom and its occurrence was clinically significant. However, the symptom was always the result of the respondent's use of medication, drugs, or alcohol, and therefore it should not be considered a psychiatric symptom. When a symptom could not reasonably be explained by the ingestion of any of these substances (e.g., Q.68, A-H Phobic Disorder), a number "3" code is provided as a coding option.
- "4" The respondent has had the symptom and its occurrence was clinically significant. However, every occurrence of symptom could be explained by a physical illness or injury. Therefore, it should not be considered a psychiatric symptom. When a symptom could not reasonably be explained by physical illness or injury (e.g., Q.104, press of speech), a number "4" code is provided as a coding option.

Occasionally a symptom has two causes: physical illness and medication, drugs or alcohol. That is, every occasion was due either to physical illness or to taking some substance. This combination of causes is also coded "4."

"5" The respondent has had the symptom; its occurrence is considered clinically significant, and it is not always attributable to the use of medication, drugs, alcohol or to a physical illness or injury. Thus, this is a plausible psychiatric symptom. Only "5" codes count toward a psychiatric diagnosis.

I. Correcting Coding Errors

Interviewer's corrections:

When an error is made, the incorrectly circled code should be struck through and the correct code circled. The initial incorrect coding should be neither obscured nor erased. A strikeout will alert the editor to the change and will allow retracing of the interviewer's steps in case the correction was in error.

EXAMPLE: Original code of 5 corrected to a code of 3:

1 3 5

EXAMPLE: Original entry of two months changed to three months:

0 3
0 2

If the interviewer finds a corrected code was actually correct, it too should be struck through and the original code reentered by hand.

EXAMPLE: Code of 5 changed to 3 and then back to 5: 1 3 5⁵

J. Interpreting Typographical Conventions Used in DIS

ASTERISKED (STARRED) 5 CODES (5*) point to those symptoms to be read to the respondent when directed to "LIST ALL CODED 5* ITEMS"

EXAMPLE: Q.159 Did you ever need a drink just after you had gotten up (that is, before breakfast)?

NO.....1
YES.....5*

BOLD PRINT AND HIGHLIGHTS: These are key words to be used for short reference to the symptoms inquired about when probing or listing symptoms.

Example: Q.164. Have you ever gotten into physical fights while drinking?