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A Comparison of Aphasic Adults' Scores on the Western Aphasia Battery and Ratings on the Functional Independence Measure

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A COMPARISON OF APHASIC ADULTS' SCORES ON THE WESTERN APHASIA BATTERY AND RATINGS ON THE FUNCTIONAL INDEPENDENCE MEASURE

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This thesis meets the standards for appearance, conforms to the style and format requirements of the Graduate School of the University of North Dakota, and is hereby approved.

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ABSTRACT

The purpose of this study was to determine for aphasic adults the relationship between scores on the Western Aphasia Battery (WAB) and ratings of the Functional Independence Measure (FIM). Fourteen aphasic adults with a mean age of 71 years, participated in this study. Each subject was interviewed by the researcher. Their communication skills in the areas of verbal expression, written expression, auditory comprehension, and reading comprehension were then rated on the FIM. The researcher conducted interviews using the seven point ordinal scale of the FIM, with each subject's speech-language pathologist and a family member about the subjects' communication skills. The researcher rated the subjects' communication skills on the FIM, based on these interviews. On a different occasion, the WAB was administered to each subject by either the researcher or the subject's speech-language pathologist.

Pearson Product Moment Correlation analyses were performed on all the numerical data. The results showed significant positive relationships ($p<.01$) between verbal expression, auditory comprehension, written expression, and reading comprehension scores on the WAB and ratings of the FIM by the researcher and the speech-language pathologists.

The verbal expression and written expression scores on the WAB were significantly correlated ($p<.01$) with the verbal expression and written expression ratings of the FIM by family members. Significant relationships ($p<.01$) were found among ratings of the FIM for verbal expression, written expression, and reading comprehension by the researcher and the speech-language pathologists.

The findings of the present study indicated that the WAB and the FIM are measuring similar aspects of communication. When the FIM is used in the same manner as the current study, there are high relationships for the four language modalities between the WAB and the FIM when scored by a speech-language pathologist. Therefore, the FIM appeared to be a valid tool to assess functional communication when rated by a speech-language pathologist. It was also found that speech-language pathologists and nonspeech-language pathologists differed in the way they rated four modalities of language on the FIM. The researcher suggested that the FIM may be valuable for supplementing standardized aphasia tests and a useful clinical tool for conveying information to the family and team members.

CHAPTER ONE

INTRODUCTION AND REVIEW OF LITERATURE

Introduction

Aphasia is an acquired impairment of language processing due to a neurological insult. Typically the impairment is sudden in onset and is a result of a cerebral vascular accident (Eisenson, 1984). Assessment plays a primary role in the rehabilitation program of individuals with aphasia. The assessment process allows the speech-language pathologist to diagnose the type of aphasia, predict language recovery, plan for treatment, and provide a basis to measure progress in treatment (Tikofsky, 1984).

Traditionally, standardized tests have been utilized to assess aphasia. According to Tikofsky (1984), the Boston Diagnostic Aphasia Examination (BDAE) (Goodglass & Kaplan, 1983), the Minnesota Test for Differential Diagnosis of Aphasia (MTDDA) (Schuell, 1972), the Porch Index of Communicative Ability (PICA) (Porch, 1971), and the Western Aphasia Battery (WAB) (Kertesz, 1982) are commonly used objective tests of aphasia. Although these tests comprehensively assess language, several researchers have

questioned their use in predicting the functional communication skills of the aphasic adult and measuring change over time (Behrmann & Penn, 1984; Lomas, Pickard, Bester, Elbard, Finlayson, & Zoghaib, 1989; Sarno, Sarno & Levita, 1971).

For the last 25 years, functional assessment tools have been developed to assess "a person's ability to function in his or her environment despite disease, disability, or social deprivation" (Frattali & Lynch, 1989, p. 70). A functional assessment tool may fall into one of three categories: multidimensional measures, unidimensional measures, or rehabilitation service measures. Multidimensional measures frequently omit communication as an area of assessment. Unidimensional measures are used in speech-language pathology and audiology, to assess functional communication. Unidimensional measures such as Communicative Abilities in Daily Living (CADL) (Holland, 1980), Communicative Effectiveness Index (CETI) (Lomas et al., 1989), and the Functional Communication Profile (FCP) (Sarno, 1969) focus on pragmatic rather than linguistic aspects of communication and are utilized by speech-language pathologists to supplement traditional assessment tests of aphasia. Measures developed for rehabilitation services usually include communication within the assessment. The Functional Independence Measure (FIM) (Hamilton, Granger, Sherwin, Zielezny, & Tashman, 1987), and the New Medico

Comprehensive Assessment Inventory for Rehabilitation (NM-CAIR) (Haffey & Johnston, 1988) are examples of rehabilitation measures which assess communication (Frattali & Lynch, 1989).

Several researchers (Holland, 1982; Lomas et al., 1989; Sarno et al., 1971) have studied the relationship between standardized tests and functional communication measures for aphasic adults. However, no studies to date have compared the scores on standardized tests with the scores on rehabilitation functional assessment measures of aphasic adults.

Statement of Problem

Standardized test scores and rehabilitation functional assessment scores may be positively or negatively correlated or unrelated if they measure different constructs.

The purpose of this study is to determine for aphasic adults the relationship between scores on the Western Aphasia Battery and ratings of the Functional Independence Measure.

This study answered the following research question:

1) What is the relationship between scores for verbal expression, auditory comprehension, written expression, and reading comprehension on the WAB and ratings on the FIM for aphasic adults?

2) What is the relationship between verbal expression, written expression, auditory comprehension, and reading comprehension ratings of the FIM by the researcher, speech-language pathologists, and family members?

Literature Review

Aphasia is an impairment of language processing. This impairment disrupts an individual's ability to formulate and comprehend linguistic symbols. Aphasia is a multimodality disorder which may affect auditory comprehension, speaking, reading and writing (Davis, 1983). The impairment is sudden in onset and can result from neuropathologies such as stroke, tumor and head injury of the left hemisphere. Many classification systems are used to describe the different types of aphasia. One classification system divides aphasia into two broad categories: fluent and nonfluent. Nonfluent aphasia results from an anterior lesion in the left hemisphere. The main symptoms presented by nonfluent aphasias include agrammatism, short phrases, noticeable effort, slow rate, awkward articulation, and minimal prosody. Fluent aphasia is caused by a posterior lesion to the left hemisphere of the brain. Symptoms of fluent aphasias may include circumlocutions, paraphasias of all types, and jargon (Davis, 1983).

The assessment protocol used in the assessment of aphasic individuals includes biographical, medical and behavioral data. Biographical data are comprised of the following information about an individual: name, age, address, family background, educational and occupational background, hobbies, premorbid intelligence, personality and communication skills, date of neurological insult, and present living environment (Davis, 1983; Rosenbek, LaPointe & Wertz, 1989). This information allows professionals to relate to the patient as a person (Rosenbek et al., 1989). Medical data consist of the person's medical history and a neurological examination which will aid in the diagnosis and prognosis of aphasia. Behavioral data are obtained from observations, and informal and formal measures that are completed by the neurologist, speech-language pathologist, nurses, occupational therapists, physical therapists, and the patient's family. The information from the various disciplines is compared, and similarities and differences in behavior are noted. All three types of data are compiled to determine a diagnosis, prognosis, and focus for treatment for the aphasic individual (Rosenbek et al., 1989).

The speech-language pathologist utilizes informal and formal procedures to assess the language impairment of the aphasic individual. An informal assessment is often conducted at the patient's bedside following the stroke. It may consist of a conversation to assess expressive and

receptive language skills. Following the initial informal assessment, formal standardized tests are administered to obtain quantifiable and objective data (Kitselman, 1985). The selection of the test to be used should be based on adherence to psychometric standards for test construction and a consideration of the intended use of the test (Tikofsky, 1984). Psychometric standards include standardization, validity, and reliability. Tikofsky (1984) stated that standardization "requires that the test instrument be administered to a large and representative sample of persons whose behavior or performance is to be evaluated" (p. 120). Speech-language pathologists should choose a test that has been standardized on a population of aphasics with similar characteristics to the person that they are assessing (Tikofsky, 1984). The validity of a test refers to "whether the test measures what it is intended to measure" (Davis, 1983, p. 129). Reliability refers to the consistency of a test score when administered to the same individual at different times by the same clinician or by other clinicians. It is also referred to as test-retest reliability (Davis, 1983, Rosenbek et al., 1989). Standardized tests will indicate standard administration and scoring procedures which contribute to the reliability of the test (Davis, 1983).

Formal standardized aphasia tests focus specifically, on the patient's linguistic abilities which may be impaired.

The Boston Diagnostic Aphasia Examination (BDAE) (Goodglass & Kaplan, 1983), Minnesota Test for Differential Diagnosis of Aphasia (MTDDA) (Schuell, 1972), Porch Index of Communicative Ability (PICA) (Porch, 1971), and the Western Aphasia Battery (WAB) (Kertesz, 1982) are commonly used objective tests that adhere to strict psychometric standards. These tests assess the patient's ability to recognize and express language through graded tasks of difficulty involving the listening, speaking, reading, and writing modalities (Tikofsky, 1984). Manochiopinig, Sheard, and Reed (1992) suggested that while formal, standardized tests "provide invaluable linguistic skills information, they may not always provide much valid information about aphasic individuals' communicative competence in spontaneous and interactive communications" (p. 519). The clinical setting reduces the patient's opportunities to utilize extralinguistic cues from the environment which may supplement comprehension and expression of language (Davis, 1983). Several researchers (Lomas et al., 1989; Manochiopinig et al., 1992; Sarno et al., 1971) indicated that standardized tests do not adequately assess the aphasic individual's true functional communication skills. Therefore, additional assessment tools that are sensitive to an individual's overall communication skills should be utilized to supplement standardized tests.

In the last six years there has been an increased interest in the use of functional assessment measures. According to Frattali (1992), "functional assessment seems to bridge the gap between identifying specific behaviours, and evaluating how those behaviours affect an individual's ability to function in natural contexts" (p. 63). Federal Legislation [Omnibus Budget Reconciliation Act (OBRA) of 1986. Section 9305 (h)(1)(A)] required that functional assessment measures be used as discharge planning tools (as cited in Frattali, 1992). In addition, "the results of the assessment will determine the patient's post-hospital needs, including the need for outpatient rehabilitative services, home health or nursing home care" (Frattali, 1992, p. 66). Third-party payor guidelines for speech-language pathology mandated that the patient's initial and present functional communication status be documented (Frattali, 1992). In response to federal legislation, the American Speech-Language-Hearing Association has funded a three-year project to develop a reliable and valid measure of functional communication.

Multidimensional, unidimensional, and rehabilitation service measures are three types of functional assessment tools. Multidimensional measures typically assess activities of daily living such as bathing, dressing, toileting, transfer, continence and feeding. Although communication is considered an activity of daily living, it

is seldom included in multidimensional functional assessment measures (Frattali, 1992).

Unidimensional measures were developed to assess the functional communication of adults with aphasia and other neurogenic disorders (Frattali, 1992). These measures focus more on an individual's pragmatic rather than linguistic abilities (Manochiopinig et al., 1992). Functional assessment of communication can be defined as follows:

> Assesses the extent of ability to communicate with others in a variety of contexts, considering environmental modifications, adaptive equipment, time required to communicate, and listener familiarity with the client. Special accommodations of the communicative partner to either receive or enhance reception must be considered. (cited in Frattali, 1992, p. 64)

Beukelman, Yorkston, and Lossing (1984) described two components of functional assessments of communication. First, the individual's communication needs are assessed on the basis of their educational, occupational and residential requirements. Secondly, an individual's communicative performance is assessed to plan a treatment program. Beukelman et al., (1984) explained that "the magnitude of a communication disability can be defined as the gap between an individual's communication needs and his or her residual communication performance (p. 102). The focus of treatment is to close the gap (Beukelman et al., 1984).

The Communicative Abilities in Daily Living (CADL (Holland, 1980), Communicative Effectiveness Index (CETI) (Lomas et al., 1989), and the Functional Communication

Profile (FCP) (Sarno, 1969) are measures designed to evaluate an aphasic individual's functional communication. The FCP was one of the first functional communication instruments developed for aphasic adults. The rationale for developing the FCP was based on the observation that improvement on formal tests does not necessarily reflect the individual's abilities to function in daily life. The FCP consists of a structured conversation where the researcher will rate residual language on a 9-point scale in five modalities: movement, speaking, understanding, reading, and a miscellaneous category including writing and calculation. Both validity and reliability have been established (Sarno et al., 1971). The CADL is a "quantitative assessment of the aphasic's functional communicative abilities by evaluating responses to "simulated life activities"" (Tikofsky, 1984, p. 142). It is a reliable and valid measurement that can be used to supplement objective linguistic tests (Holland, 1980). Lomas et al. (1989) were dissatisfied with the existing tests of functional communication because they were not sensitive to changes over time. As a result, they created the CETI to measure functional communicative performance over time. The test consists of 16 situations which are rated on a scale from one (extremely poor) to seven (excellent). This instrument is both reliable and valid (Lomas et al., 1989). The CADL,

CETI, and the FCP are all unidimensional measures of functional communication (Frattali & Lynch, 1989).

Unlike unidimensional instruments, rehabilitation functional assessment measures, include communication into their evaluation of domains (Frattali & Lynch, 1989). The Functional Independence Measure (FIM) (Hamilton et al., 1987) and the New Medico Comprehensive Assessment Inventory for Rehabilitation (NM-CAIR) (Haffey & Johnston, 1988) are two examples of rehabilitation measures. The FIM was designed to be used with a wide range of populations and ages. It consists of six basic life activities, one of which is communication. Communication is assessed simply by a receptive/expressive dichotomy. An overall level of independence is determined by a seven point ordinal scale. The NM--CAIR is "a more in-depth measure used to assess individuals who have sustained closed-head injury, and (sic) addresses a broader scope of communication abilities within several contexts" (Frattali, 1992, p. 72).

The FIM is a widely used rehabilitative instrument, and is presently utilized in 36 states and in six countries. Currently, the FIM is employed in the field of speech-language pathology as a functional assessment instrument to supplement standardized tests of aphasia (Frattali, 1992). Despite its wide usage, no studies to date have compared scores on the FIM to scores on a standardized test of aphasia. Therefore, the purpose of this study is to

determine for aphasic adults, the relationship between scores on the Western Aphasia Battery and ratings of the Functional Independence Measure.

CHAPTER TWO

THE METHODOLOGY

The purpose of this study was to determine the relationship for aphasic adults between scores on the Western Aphasia Battery (WAB) and ratings of the Functional Independence Measure (FIM). Sixteen aphasic adults were administered the WAB and their verbal expression, written expression, auditory comprehension, and reading comprehension skills were rated by the researcher on the communication subtest of the FIM. The researcher interviewed each subject's speech-language pathologist and a family member about the subject's communication skills in terms of the aforementioned language modalities and rated the FIM accordingly. For three subjects, a nurse was also interviewed and the researcher rated the subject's communication skills on the FIM. No restrictions were placed on the subjects that could participate in the study.

Subjects

Subjects for this study were selected from Deer Lodge Centre and St. Boniface Hospital in Winnipeg, Manitoba, MeritCare Hospital in Fargo, North Dakota, and from the

University of North Dakota's Speech, Language, and Hearing Clinic in Grand Forks, North Dakota. Speech-language pathologists in these facilities asked for volunteers to participate in this study. Sixteen aphasic adults were chosen on the basis of having suffered a left cerebrovascular accident due to a neurological insult. Sixteen subjects were tested but due to incomplete information, only the data for fourteen subjects were utilized. Table 1 shows the demographics for the fourteen subjects, including age, sex, post-onset date, and education completed.

Table 1

Subjects' Age, Sex, Time Post Onset (P.O) in Months of Aphasia, and Education

SUBJECT	AGE	SEX	P.O.	EDUCATION
1	70	F	14	12
2	69	M	19	8
3	74	M	11	11
4	87	F	7	15
5	73	M	4	15
6	65	M	17	8
7	49	M	40	15
8	77	F	5	9
9	67	M	8	15
10	68	M	72	12
11	78	F	36	12
12	68	F	1	8
13	80	F	4	8
14	69	M	41	12
Mean	71.0		19.9	11.4

The data for eight males and six females were used in this study. Their ages ranged from 49 to 87 years (M = 71 years). At the time of testing their post-onset date of stroke ranged from 1 to 72 months (M = 19.9 months). The amount of education ranged from 8 to 15 years (M = 11.43 years). Two subjects were inpatients; 12 subjects were outpatients who lived independently or with their spouses or family members. Thirteen subjects were right-handed premorbidly and one subject was left-handed premorbidly. Individuals with visual, hearing, or attention span impairments were not excluded from this study. A wide range of subjects with different types and severity of aphasia were used in this study, to provide a broader level of interpretation of the FIM.

This study involved one researcher, six speech-language pathologists, and 14 family members who were involved in generating data by completing the scoring of the FIM. Although it was anticipated that the subjects' nurses would be interviewed for the FIM, only three subjects were inpatients. As a result there was insufficient data to include the nurses' FIM ratings in the statistical analyses.

Instruments

Subjects' communication skills were assessed by administering the Western Aphasia Battery, a standardized aphasia test and the Functional Independence Measure, a

rehabilitation functional assessment measure. The WAB is a commonly used standardized aphasia test. All four language modalities--verbal expression, auditory comprehension, written expression, and reading comprehension--can be assessed using this tool. For the purposes of this study, the verbal expression scores were calculated from the spontaneous speech, repetition, and naming subtests. An Aphasia Quotient (AQ) was determined from the spontaneous speech, auditory comprehension, repetition, and naming subtests. The AQ indicates severity of the language impairment, provides a quantitative measure of change, and aids in differential diagnosis and in classification of aphasics into eight types of aphasia (Tikofsky, 1984).

The FIM measures the cost of a disability based on the level of independence from or dependence on assistive care. A seven-level ordinal scale from least independent to most independent is utilized to rate the individual's independence/dependence. Appendix B contains a copy of the rating scale. The FIM has good inter-rater reliability, face validity, predictive validity, and precision. It can be used for individuals with a wide variety of medical impairments and can be administered by medical and allied health professionals, nonclinicians, family members, and by patients, with the appropriate training. The FIM includes the following domains: self-care, sphincter control,

mobility, locomotion, communication, and social cognition (Hamilton et al., 1987).

In the present study, only the communication subtest was analyzed. The FIM (State University of New York [SUNY], 1990) indicated that the usual mode of expression of the subject, either verbal expression or written expression, and the usual mode of comprehension of the subject, either auditory comprehension or reading comprehension, should be rated. If both modes of expression and comprehension are used equally, both modes should be rated. For the purposes of this study, the FIM was rated on the seven level scale for the four language modalities--verbal expression, written expression, auditory comprehension, and reading comprehension--regardless of whether the subjects used verbal expression and written expression equally or auditory comprehension and reading comprehension equally. The FIM was employed in this manner in order to provide scores of the same four modalities as the WAB.

Procedure

Before testing began, the researcher explained to the subject and a family member the nature of this research project and their expected involvement in the collection of data. The subject and a family member were required to sign a consent form granting the researcher permission to obtain the subject's age, diagnosis, severity and date of onset of

aphasia from his or her case file and permission to interview his or her speech-language pathologist, nurse, and a family member regarding the subject's verbal expression, written expression, auditory comprehension, and reading comprehension skills.

Fourteen aphasic adults were administered the WAB and the FIM in the hospital's communication department or the subject's home within a one month period during the year 1993. The researcher was responsible for administering both the FIM and the WAB at two different times. The ratings on the communication subtest of the FIM were obtained before administering the WAB to ensure that there was no bias on the part of the researcher. The researcher developed a list of questions for verbal expression, written expression, auditory comprehension, and reading comprehension, which are shown in Appendix C, to guide interviews with each subject. Based on this interview, which lasted approximately 30 minutes, the researcher rated the subject's verbal expression, written expression, auditory comprehension, and reading comprehension skills on the FIM.

After the researcher completed rating the subject's communication skills on the FIM, the researcher interviewed the subject's speech-language pathologist, nurse and family member. The researcher used a list of questions shown in Appendix D, that she developed for the four language modalities, to guide these interviews. Then the researcher

rated the subject's verbal expression, written expression, auditory comprehension, and reading comprehension skills on the FIM according to the speech-language pathologists' and family members' answers from the interview. Each interview was tape recorded and reviewed at a later date. All of the speech-language pathologists held their certificates of clinical competence conferred by the American Speech-Language-Hearing Association (ASHA) and had had experience in diagnosing and treating aphasia for a minimum of two years. The attending nurse was interviewed only if the subject was an inpatient. Therefore when each nurse was interviewed, he or she had personal knowledge of the subject's communication skills. Interviews with the speech-language pathologist, nurse and family member for the FIM lasted approximately ten to fifteen minutes each. Inter-rater reliability between the speech-language pathologist and the researcher for the FIM was determined and will be discussed later in this text.

After all interviews were conducted and the ratings of the FIM were completed, the researcher administered the WAB. For 5 subjects, their speech-language pathologists administered the WAB. The researcher followed the standardized procedures as indicated in the WAB test manual (Kertesz, 1982). Administration of the WAB required approximately 1 to 1 1/2 hours depending on the subject.

The researcher obtained the subjects' age, diagnosis, severity of aphasia and date of onset of aphasia from the subjects' case files after testing was completed.

Data and Data Analysis

The data for this study consisted of scores on the Western Aphasia Battery (WAB) and ratings of the Functional Independence Measure (FIM) for fourteen aphasic subjects. Scores were obtained on the WAB for verbal expression, written expression, auditory comprehension, and reading comprehension. An Aphasia Quotient and spontaneous speech subtest scores were also calculated from the WAB. The FIM data was based on the application of seven point scales to four language modalities. Verbal expression and written expression skills were rated using the expression scale. Auditory comprehension and reading comprehension were rated using the comprehension scale. The ratings were determined on these four language modalities, based on information from three types of raters; the researcher, speech-language pathologists, and family members. The results of the WAB and the FIM were tabulated and analyzed using Pearson Product Moment Correlation analyses.

Reliability

Interjudge reliability was calculated for the researcher's ability to accurately rate the FIM. The

ratings for the four language modalities on FIM were determined by the researcher for each subject, based on information gathered from the speech-language pathologists using the questions shown in Appendix D. These ratings were compared to the ratings determined independently by the speech-language pathologists. This was completed for 7 of the 14 subjects participating in the study. Reliability scores were .821 for verbal expression, .949 for auditory comprehension, .893 for writing, and .601 for reading. Discrepancies in the ratings between the researcher and the speech-language pathologists did not exceed two levels of independence, of the seven levels on the ordinal scale of the FIM, for any modality.

CHAPTER THREE

RESULTS

The purpose of the present study was to determine the relationship between scores on the Western Aphasia Battery and ratings of the Functional Independence Measure for aphasic adults. The following research questions were asked: (1) What is the relationship between scores for verbal expression, auditory comprehension, written expression, and reading comprehension on the WAB and ratings of the FIM for aphasic adults? (2) What is the relationship between verbal expression, written expression, auditory comprehension, and reading comprehension ratings of the FIM by the researcher, speech-language pathologists, and family members?

Relationship between the WAB and the FIM

The first research question asked what is the relationship between scores for verbal expression, auditory comprehension, written expression, and reading comprehension on the WAB and ratings of the FIM. Tables 2 and 3 present the raw data collected for 14 subjects on the WAB and the FIM.

Table 2

WAB scores for Verbal Expression (VE), Auditory Comprehension (AC), Written Expression (WE), Reading Comprehension (RC), Aphasia Quotient (AQ), Informationa Content Subtest (IC), and Fluency Subtest (FL) for 14 Subjects

	WAB						
SUBJECTS	VE	AC	WE	RC	AQ	IC	FL
1	167	166	69.5	82.0	69.5	*	*
2	143	157	49.0	79.0	71.3	7	8
3	196	199	77.0	82.0	89.7	9	8
4	209	182	75.5	74.0	94.2	10	9
5	203	200	81.0	100.0	94.8	10	9
6	152	168	58.5	57.5	65.2	6	5
7	72	118	45.0	41.0	35.2	3	2
8	198	186	90.0	82.0	94.2	10	10
9	114	123	1.5	38.5	56.7	1	0
10	183	195	54.5	79.0	81.3	9	5
11	128	185	34.0	61.5	82.4	6	5
12	66	127	0.0	22.0	25.9	1	0
13	102	100	24.5	36.0	48.4	*	*
14	28	108	0.0	0.0	20.0	2	0
TOTAL	1961.00	2209.00	660.00	834.50	928.35	74.00	61.00
MEAN	140.07	157.79	47.14	56.61	66.35	6.17	5.08
SD	57.40	35.86	31.11	28.31	25.71	3.59	3.80

* data not available

Table 3

FIM Ratings for Verbal Expression (VE), Auditory Comprehension (AC), Written Expression (WE), and Reading Comprehension (RC) By the Researcher (R), Speech-Language Pathologist (SLP), and Family Members (F) for 14 Subjects

	R				SLP				F			
SUBJECTS	VE	AC	WE	RC	VE	AC	WE	RC	VE	AC	WE	RC
1	3	6	5	5	3	4	3	3	2	3	2	6
2	5	4	3	5	5	4	4	5	5	5	2	5
3	6	6	5	5	4	6	5	5	4	5	5	4
4	6	7	6	6	5	4	6	5	5	4	5	5
5	6	7	6	7	5	6	5	5	6	6	2	7
6	4	5	3	4	3	5	2	4	4	6	4	2
7	2	5	4	4	2	5	3	3	2	5	2	1
8	6	7	6	6	6	7	4	6	6	6	4	6
9	2	6	1	2	2	3	1	3	2	7	1	6
10	6	6	5	5	5	6	1	4	5	6	6	6
11	2	5	1	5	4	6	1	3	3	6	1	6
12	1	4	1	2	1	3	1	2	2	6	1	5
13	2	3	1	1	2	2	1	1	5	6	1	1
14	2	4	1	1	2	2	1	1	2	5	1	1
TOTAL	53.00	75.00	48.00	58.00	49.00	63.00	38.00	50.00	63.00	76.00	37.00	61.00
MEAN	3.79	5.36	3.42	4.14	3.50	4.50	2.71	3.57	3.79	5.43	2.64	4.36
SD	1.97	1.28	2.10	1.91	1.56	1.60	1.81	1.56	1.58	1.02	1.78	2.17

Table 4 presents the Pearson Product Moment Correlation Coefficients between the scores for four language modalities--verbal expression, auditory comprehension, written expression, and reading comprehension--on the WAB and the ratings of the FIM by the researcher, speech-language pathologists and family members. Significant

Table 4

Pearson Product Moment Correlation Coefficients Between Verbal Expression (VE), Auditory Comprehension (AC), Written Expression (WE), and Reading Comprehension (RC) Scores on the WAB and Ratings of the FIM by the Researcher, Speech-Language Pathologists (SLP), and Family Members

	WAB			
FIM	VE	AC	WE	RC
Researcher				
VE	.877*	.807*	.838*	.814*
AC	.775*	.733*	.700*	.686*
WE	.814*	.722*	.922*	.803*
RC	.846*	.893*	.887*	.918*
SLP				
VE	.831*	.827*	.794*	.832*
AC	.682*	.841*	.794*	.744*
WE	.688*	.562	.793*	.679*
RC	.848*	.812*	.830*	.842*
Family				
VE	.711*	.559	.660	.658
AC	-.163	-.118	-.369	-.216
WE	.713*	.680*	.678*	.562
RC	.615	.664*	.348	.647

* p<.01 two-tailed

correlations (p<.01) were found between the verbal expression, written expression, auditory comprehension, and

reading comprehension scores on the WAB and ratings of the four language modalities on the FIM by the researcher and the speech-language pathologists. Correlations for the verbal expression, auditory comprehension, and written expression scores on the WAB and verbal expression, written expression and reading comprehension ratings of the FIM by family members were also significant ($p<.01$).

Verbal Expression

Correlations for verbal expression scores on the WAB and ratings of the FIM by the three types of raters ranged from -.163 to .877. The highest correlation was .877 between the verbal expression score on the WAB and the verbal expression rating of the FIM by the researcher. The lowest correlation was -.163 between the verbal expression score of the WAB and the auditory comprehension rating of the FIM by the family. Significant correlations ($p<.01$) were found between the verbal expression scores on the WAB and all of the verbal expression ratings of the FIM by the researcher, speech-language pathologists, and family members. The verbal expression scores on the WAB positively and significantly correlated ($p<.01$) with the ratings of all four language modalities on the FIM by the researcher and speech-language pathologists.

Auditory Comprehension

Correlations for auditory comprehension scores on the WAB and ratings of the FIM by three types of raters ranged from -.118 to .893. The highest correlation of .893 was between the auditory comprehension scores on the WAB and the reading comprehension ratings of the FIM by the researcher. The lowest correlation of -.118 was between auditory comprehension scores on the WAB and the auditory comprehension ratings of the FIM by the family. Correlations were significant ($p<.01$) between the auditory comprehension scores on the WAB and all of the ratings of the FIM by the researcher. Significant correlations ($p<.01$) were found between auditory comprehension scores on the WAB and the verbal expression, auditory comprehension, and reading comprehension ratings of the FIM by speech-language pathologists. No significant correlations occurred between the auditory comprehension scores on the WAB and the auditory comprehension ratings of the FIM by the family members. However, significant correlations ($p<.01$) were found between the auditory comprehension scores on the WAB and the written expression and reading comprehension ratings of the FIM by family members.

Written Expression

Correlations for written expression scores between the WAB and ratings of the FIM by three types of raters ranged

from -.369 to .922. The highest correlation was .922 between the written expression scores on the WAB and the written expression ratings of the FIM by the researcher. The lowest correlation was -.369 between the written expression scores on the WAB and the written expression ratings of the FIM by family members. Significant, positive correlations ($p<.01$) were found between the written expression scores on the WAB and all of the FIM ratings by the researcher and speech-language pathologists. Significant correlations ($p<.01$) were found between the written expression scores on the WAB and the written expression ratings of the FIM by family members.

Reading Comprehension

Correlations for reading comprehension scores on the WAB and ratings of the FIM by three types of raters ranged from -.216 to .918. The highest correlation was .918 between the reading comprehension scores on the WAB and the reading comprehension ratings of the FIM by the researcher. The lowest correlation was -.216 between the reading comprehension scores on the WAB and the auditory comprehension ratings of the FIM by the family. Correlations between the reading comprehension scores on the WAB and all of the FIM ratings by the researcher and speech-language pathologists were positive and significant ($p<.01$). The reading comprehension scores on the WAB and the ratings

of the four modalities of the FIM by the family members did not correlate significantly ($p<.01$).

Relationship Between the Aphasia Quotient of the WAB and the Ratings of the FIM

Table 5 contains the Pearson Product Moment Correlation Coefficients between the Aphasia Quotient, Informational Content, and Fluency scores of the WAB and verbal expression, auditory comprehension, written expression, and reading comprehension ratings of the FIM by the three types of raters. Correlations between the Aphasia Quotient of the WAB and ratings of the FIM by three types of raters ranged from -.075 to .887. The highest correlation was .887 between the WAB Aphasia Quotient and the verbal expression rating of the FIM by speech-language pathologists. The lowest correlation was -.075 between the WAB Aphasia Quotient and the auditory comprehension ratings of the FIM by the family.

Positive and significant correlations ($p<.01$) were found between the Aphasia Quotient of the WAB and all the ratings of the FIM by the researcher. Significant relationships ($p<.01$) existed between the Aphasia Quotient of the WAB and verbal expression, auditory comprehension, and reading comprehension ratings of the FIM by the speech-language pathologists. The Aphasia Quotient of the WAB and the verbal expression ratings of the FIM by the family members also correlated significantly ($p<.01$).

Table 5

Pearson Product Moment Correlation Coefficients Between the Aphasia Quotient (AQ), Informational Content (IC), and the Fluency (FL) Scores of the WAB and Verbal Expression (VE), Auditory Comprehension (AC), Written Expression (WE), and Reading Comprehension (RC) Ratings of the FIM by the Researcher, Speech-Language Pathologists (SLP), and Family Members

	WAB		
FIM	AQ	IC	FL
Researcher			
VE	.830*	.941*	.889*
AC	.745*	.694*	.625
WE	.713*	.864*	.810*
RC	.863*	.920*	.926*
SLP			
VE	.887*	.936*	.924*
AC	.737*	.746*	.701*
WE	.639	.711*	.808*
RC	.838*	.869*	.932*
Family			
VE	.712*	.932*	.922*
AC	-.075	-.293	-.319
WE	.614	.730*	.584
RC	.649	.411	.434

* $p<.01$ two-tailed

Relationship between the Spontaneous Speech Subtest of the WAB and the FIM

Correlations between the spontaneous speech subtest of the WAB and ratings of the FIM by three types of raters ranged from -.293 to .941 for informational content scores and from -.319 to .932 for fluency scores of the WAB. The highest correlations were .941 between informational content scores

of the WAB and the verbal expression ratings of the FIM by the researcher and .932 between fluency scores of the WAB and the verbal expression ratings of the FIM by speech-language pathologists. The lowest correlations were -.293 between informational content scores of the WAB and the auditory comprehension ratings of the FIM by the family and -.319 between the fluency scores of the WAB and the auditory comprehension ratings of the FIM by the family. Correlations were significant ($p<.01$) between the informational content and fluency scores of the WAB and the ratings of the FIM by the researcher except between the fluency scores and the auditory comprehension ratings of the FIM. Informational content and fluency scores of the WAB were positively and significantly correlated ($p<.01$) with all FIM ratings by the speech-language pathologists. Significant correlations ($p<.01$) were found between the informational content and fluency scores of the WAB and the verbal expression ratings of the FIM by the family and between the informational content scores of the WAB and the written expression ratings of the FIM by the family.

Relationship Between Ratings of the FIM by Three Types of Raters

The second question posed by this study was whether there was a relationship between FIM ratings by the researcher, speech-language pathologists, and family members. Tables 6 through 9 present the Pearson Product

Moment Correlation Coefficient results between the three types of raters on the FIM.

Verbal Expression

Table 4 reveals the correlation for verbal expression ratings of the FIM by the researcher, speech-language pathologists, and family members. Correlations ranged from .799 to .891. The highest correlation was .891 between the researcher and the speech-language pathologists. The lowest correlation was .799 between the family and the speech-language pathologists. All correlations for verbal expression ratings were significant ($p<.01$).

Table 6

Pearson Product Moment Correlation Coefficient Between the FIM Ratings for Verbal Expression by the Researcher (R), Speech-Language Pathologists (SLP), and Family Members (F)

	R	SLP	F
R	1.000*	.891*	.802*
SLP	.891*	1.000*	.799*
F	.802*	.799*	1.000*

* $p<.01$ two-tailed

Auditory Comprehension

Table 7 contains the correlations for auditory comprehension ratings of the FIM by the researcher, speech-language pathologists, and family members. Correlations ranged from -.127 to .656. The highest correlation was .656

between the researcher and the speech-language pathologists. The lowest correlation was -.127 between the family and the researcher. No correlations were significant ($p<.01$) and there was one negative correlation between the researcher and the family.

Table 7

Pearson Product Moment Correlation Coefficients Between the FIM Ratings for Auditory Comprehension by the Researcher (R), Speech-Langauge Pathologists (SLP), and the Family Members (F)

	R	SLP	F
R	1.000*	.656	-.127
SLP	.656	1.000*	.094
F	-.127	.094	1.000*

* $p<.01$ two-tailed

Written Expression

The correlations for written expression ratings of the FIM by the researcher, speech-language pathologists, and family members are shown in table 8. Correlations ranged from .466 to .801. The highest correlation was .801 between the researcher and the speech-language pathologists. The lowest correlation was .466 between the speech-language pathologists and the family. Correlations between the researcher and the speech-language pathologists and between the researcher and the family were significant ($p<.01$).

Table 8

Pearson Product Moment Correlation Coefficients Between the FIM Ratings for Written Expression by the Researcher (R), Speech-Langauge Pathologists (SLP), and the Family Members (F)

	R	SLP	F
R	1.000*	.801*	.722*
SLP	.801*	1.000*	.466
F	.722*	.466	1.000*

* p<.01 two-tailed

Reading Comprehension

The correlations for reading comprehension ratings of the FIM by the researcher, speech-language pathologists, and family members are presented in table 9. Correlations ranged from .550 to .874. The highest correlation was .874 between the researcher and the speech-language pathologists. The lowest correlation was .550 between the speech-language pathologists and the family. Significant correlations ($p<.01$) were found between the researcher and the speech-language pathologists and between the researcher and the family.

Table 9

Pearson Product Moment Correlation Coefficients Between the FIM Ratings for Reading Comprehension by the Researcher (R), Speech-Language Pathologists (SLP), and Family Members (F)

	R	SLP	F
R	1.000*	.874*	.616
SLP	.874*	1.000*	.550
F	.616	.550	1.000*

* $p<.01$ two-tailed

CHAPTER FOUR

DISCUSSION

The purpose of the present study was to determine for aphasic adults the relationship between the scores on a standardized language test, the Western Aphasia Battery (WAB) and on a rehabilitation functional assessment measure, the Functional Independence Measure (FIM). The two questions addressed by this study were: 1) What is the relationship between scores for verbal expression, auditory comprehension, written expression, and reading comprehension of the WAB and ratings of the FIM? and 2) What is the relationship between verbal expression, auditory comprehension, written expression, and reading comprehension ratings of the FIM by the researcher, speech-language pathologists and family members.

First the relationship between scores for verbal expression, auditory comprehension, written expression, and reading comprehension on the WAB and ratings of the FIM by the researcher, speech-language pathologists, and family members was investigated. Statistical analysis revealed a positive relationship between scores on the WAB and the ratings provided on the FIM. Scores on the WAB and ratings

of the FIM appeared to be assessing similar levels of communication for verbal expression, auditory comprehension, written expression, and reading comprehension. The way in which the FIM was utilized in this study, indicated that the communication subtest of the FIM was an effective, reliable and valid tool for measuring functional communication when compared to the level of severity on the WAB.

Holland (1980) stated that available functional communication measures may correlate well with existing standardized language tests because they are measuring the same dimensions of communication. She discovered that although the Communication Activities of Daily Living (CADL) (Holland, 1980) correlated significantly and positively with two standardized tests, the Porch Index of Communicative Ability (PICA) (Porch, 1971) and the Boston Diagnostic Aphasia Examination (BDAE) (Goodglass and Kaplan, 1983), the CADL was more accurate for predicting functional communication skills.

Several authors (Lomas, Pickard, Bester, Elband, Finlayson, & Zoghaib, 1989) found that the WAB and the Speech Questionnaire (1992), a functional communication measure, correlated significantly. The authors concluded that the Speech Questionnaire measured dimensions of language rather than communication. In the same study, Lomas et al. (1989) hypothesized that "functional communication is a separate but overlapping dimension to

language" (p. 120). Based on the findings of Holland (1980), Lomas et al. (1980), and the present study, functional communication measures may correlate significantly with standardized tests and be able to provide additional valid information about everyday communication skills.

This study also found that there was a higher correlation on the WAB and the FIM when the subject was rated on the FIM by a speech-language pathologist than by the family. Helmick, Watamori, and Palmer (1976) supported these findings in their study, where they compared the ratings of a functional communication measure, the Functional Communication Profile (FCP) between aphasic spouses and speech-language pathologists to the results on a standardized language test, the Porch Index of Communicative Ability (PICA). There was a negative correlation betw. ratings of the FCP by the aphasic spouses and scores on the PICA, whereas there was a significant correlation between the ratings of the FCP by the speech-language pathologists and the scores on the PICA. Results of the present study concur with Helmick et al. (1976) in that when the FIM is rated by a speech-language pathologist, a higher correlation is found with the standardized language test, the WAB.

When comparing scores on the WAB to the ratings of the FIM by the researcher, speech-language pathologists, and family members, the family members' correlations were lower

than the speech-language pathologists' ratings for all modalities. Many explanations may account for these findings. Amount of counselling provided to the family by the speech-language pathologist may account for the family's knowledge or lack of knowledge regarding the subject's communication skills. The family's acceptance of the subject's communication disabilities may also play a role in their ability to accurately rate their communication skills. The family may have more difficulty rating the subject's communication because they are not as knowledgeable about aphasia. Other factors such as the post-onset time and severity may have influenced their ability to rate the subject's communication on the FIM. The families of subjects who are still in the hospital may spend less time with them and do not have knowledge of their ability to express daily needs whereas the families that live with the subject may be more knowledgeable about their functional communication skills. The family may be less knowledgeable and may be less accepting of their disability, if the subject has had a recent stroke compared to a subject who had a stroke a year ago.

Significant relationships were found between the informational content and fluency subtests of the WAB and all verbal expression ratings of the FIM. Trupe (1984) reported that these two subtests contribute the greatest to the total score, the Aphasia Quotient. The highest

correlation was between the informational content subtest of the WAB and the verbal expression ratings of the FIM. Crary and Rothi (1989) studied the relationships between the 10 subtests and the Aphasia Quotient of the WAB. Results showed that the highest significant relationship was between the informational content subtest and the Aphasia Quotient. They further suggested that subjects who score high on the informational content subtest must also have "some degree of intact auditory and visual comprehension in order to respond to spoken questions and describe a complex picture" (p. 165). Kertesz (1979) reported that "our information content scale approximates the assessment of functional communication, because it only scores the amount of information actually communicated in response to everyday, conversational questions and to descriptions of a picture" (p. 44).

The second research question addressed the relationship between verbal expression, auditory comprehension, written expression, and reading comprehension ratings of the FIM by the researcher, speech-language pathologists, and family members. The strongest agreement between all raters was for verbal expression and the strongest disagreement was for auditory comprehension. When comparing the ratings made by the researcher, speech-language pathologists, and family members, the highest correlations were between the researcher and the speech-language pathologists. The lowest

correlations were between the ratings provided by the family members and the speech-language pathologists.

Based on the results of the present study, it appeared that there was a difference in how speech-language pathologists and nonspeech-language pathologists rated aphasic adults' communication skills. This finding was supported by Adamovich's (1990) study which compared the FIM ratings by speech-language pathologists and nurses. Nurses consistently rated subjects' communication skills higher than speech-language pathologists at the time of discharge. There was a significant difference between the two raters for verbal expression, auditory comprehension, and reading comprehension. She concluded that the higher FIM ratings, which indicate a greater level of independence, by the nurses may confuse the patients, family members and third party payors.

There are several explanations for the differences in FIM ratings by speech-language pathologists and family members. Adamovich (1990) stated that in her study, the two raters utilized different criteria or methods for assessing functional communication. In the present study, differences in the methods of assigning FIM ratings were attempted to be controlled by having the researcher conduct interviews with the family members and the speech-language pathologists using the same questionnaire. However, the speech-language pathologists may have utilized previous knowledge about the

subjects' performance on standardized tests or structured activities as a basis to their answers on the questionnaire. Family members would have based their answers on their observations of the subject communicating in a more natural situation. Therefore, the FIM ratings may have differed between the three types of raters due to the different experiences the speech-language pathologists and the family members had with the subjects.

A second explanation of the differences in FIM ratings may be attributed to different perceptions by the family members and the speech-language pathologists of the nature of the communication difficulties. Shewan and Cameron (1984) discovered that spouses' and aphasic adults' perceptions of communication difficulties differed. Many spouses were unaware of the nature of the communication difficulties experienced by their aphasic spouse. The severity level of aphasia did not influence aphasics' spouses perceptions of communication difficulties. However, spouses of subjects who were receiving treatment were more aware of the communication difficulties.

In relation to the present study, time post-onset, length of language intervention, and amount of counselling are factors that may have affected FIM ratings by the family. The length of time post-onset of aphasia and length of language intervention varied among the 14 subjects participating in the study. The amount of counselling the

family members received during the course of treatment and the degree of acceptance of the aphasic's communication difficulties were not controlled in this study but may have influenced FIM ratings by the family.

Helmick, Watamori, and Palmer (1976) confirmed that spouses of persons with aphasia do not clearly understand the patients' communication abilities. Results indicated that spouses rated the aphasic's communication as less impaired than speech-language pathologists using the Functional Communication Profile (FCP), a functional communication tool. The authors expressed concern about the spouses lack of understanding because they stated it may lead to unrealistic expectations of language performance. In addition, they noted that counselling for the spouse was crucial when the patient was discharged from therapy or when receiving therapy on an outpatient basis. Although the FIM was not developed for these purposes, it may be a beneficial tool to use with family members for measuring their understanding of the aphasic persons' communication skills.

Linebaugh and Young-Charles (1981) had spouses and speech-language pathologists rate the performance of 58 subjects on 40 functional communication tasks, 10 in each language modality and then rate the confidence they had in making those ratings. The authors found that "both spouses and speech-language pathologists were highly confident of their ratings of the patients' functional communicative

abilities" (p. 230), especially for the verbal and auditory modalities. The results of the present study indicated that raters had the strongest agreement for verbal expression which is partially supported by Linebaugh and Young-Charles' study. They also concluded that the raters were more confident in rating expressive modalities than in rating receptive modalities.

One significant finding was the negative correlation between the auditory comprehension ratings of the FIM by family members and speech-language pathologists. According to the raw data, family members rated subjects higher than the speech-language pathologists. As previously mentioned, the families' ratings of auditory comprehension were negatively correlated with the WAB for four language modalities. According to Linebaugh and Young-Charles (1981) it is more difficult to rate receptive modalities due to the lack of overt responses. Subjects may use appropriate pragmatic behaviors such as head nods and eye contact which may lead family members to the mistaken conclusion that the subject understands the message.

The variability in ratings among the three types of raters may have been due to the lack of guidelines and instructions of how to use the FIM. Levels 1 through 5 pertained to basic daily needs and levels 6 to 7 dealt with complex ideas. The researcher found that basic daily needs and complex ideas were on the extremes of the communication

spectrum. There was no way to rate functional communication that was not complex or that did not pertain to daily needs. In addition, the subject' communication skills could not be rated higher than a six, if they required assistive devices such as augmentative communication devices, glasses or hearing aids. Difficulty was experienced by the raters when estimating the percentage of prompting (i.e. repetition, visual or gestural cues) that the subject required. All ratings were completed by the researcher so that the levels on the FIM were interpreted similarly. The lack of sensitivity in the scoring of the ratings of the FIM may still present a problem in its future use.

The FIM has been criticized in the literature (Frattali, 1992) for its lack of sensitivity to measure change in functional communication over time and its use as a discharge planning tool. Due to the nature of the present study, no further information was gained to support or discredit these criticisms. It was the opinion of the researcher that the FIM's crude scoring system would make it difficult to measure subtle changes in functional communication skills. Therefore, it may not be appropriate to use as a discharge planning tool.

When reviewing related literature, Beukelman, Yorkston, and Lossing (1984) described two components of functional communication assessments. The first component involved determining the individual's communication needs. The FIM

does not consider the communication needs of individuals. The second component consisted of assessing and individual's communicative performance to plan a treatment program. The FIM does allow the diagnostician to determine the individual's communicative performance. Since the final result of rehabilitation is to have the individual function in society despite their communication impairments (Frattali & Lynch, 1989), the researcher believed that the FIM and other functional communication measures should account for the individual's communication needs in their environment.

Although the FIM may not be a sensitive discharge tool or sensitive to change in terms of communication, it may be a useful tool in the clinical setting. The FIM is quick and easy to administer and may be valuable for supplementing standardized tests. The information such as level of independence could be used to explain the subjects' functional communication status to family members and other interdisciplinary team members. Further, it may be easier for family members and team members to interpret the assessment results of the different language modalities in terms of levels of independence.

CHAPTER V

SUMMARY AND CONCLUSIONS

The purpose of the present study was to determine for aphasic adults the relationship between the scores on the Western Aphasia Battery (WAB) and ratings of the Functional Independence Measure (FIM). Verbal expression, written expression, auditory comprehension, and reading comprehension skills were assessed using the WAB and ratings determined on the FIM.

Based on the results of the present study, the following conclusions may be drawn:

1. Scores on the WAB and ratings of the FIM appeared to be assessing similar levels of communication for verbal expression, auditory comprehension, written expression, and reading comprehension.
2. There is a higher reliability for four language modalities between the WAB and the FIM when the subject was rated on the FIM by a speech-language pathologist than by the family.
3. The strongest agreement between speech-language pathologists and nonspeech-language pathologists

was for verbal expression and the strongest disagreement was for auditory comprehension.

Based on these findings, it was concluded that the communication subtest of the FIM was an effective, reliable and valid tool for measuring functional communication, when utilized in the same manner as the current study and rated by a speech-language pathologist. Furthermore, the FIM may be a useful clinical tool for conveying information to the family and team members about the individual's communication independence but its usefulness as an assessment tool for measuring change over time requires further investigation.

The following recommendations were derived from the investigation of the present study:

1. Further studies utilizing the FIM should have stricter subject selection criteria such as controlling for length of post-onset from the neurological insult and length of speech intervention. Since the FIM is controversial for its use as a discharge planning tool, including subjects who are inpatients, have a recent post-onset date, and who are acute patients may be more relevant for its use in a rehabilitation setting.
2. Future studies should attempt to control for the amount of counselling family members are provided by the speech-language pathologist. The amount of counselling may influence the family members'

awareness of the subjects' communication difficulties and abilities.

3. It is also recommended that an equal number of fluent and nonfluent aphasics be included in the study. When comparing functional and standardized tools, a difference may be noted in the correlational results based on the type of aphasia.

4. Future studies should use the Rehabilitation Institute of Chicago Functional Assessment Scale (RIC-FAS) (Rehabilitation Institute of Chicago [RIC], 1992). Portions of the FIM such as the communication subtest have been modified and expanded in this new functional rehabilitation measure. Some of the problems encountered by the researcher with the FIM may have been ameliorated by the RIC-FAS.

APPENDICES

APPENDIX A

SUBJECT CONSENT FORM

APPENDIX A

CONSENT TO PARTICIPATE IN A STUDY OF FUNCTIONAL COMMUNICATION

The purpose of this study is to determine whether formal tests accurately predict the everyday communication abilities of aphasic adults. It is anticipated that this study will help speech-language pathologists decide whether additional tests are needed to assess everyday communication abilities.

We would invite you to participate in this study as the information we gain here will help us to learn about assessment tools. As a subject, you will be asked to answer some questions verbally and in writing regarding everyday topics. In addition, the researcher will ask your speech-language pathologist, nurse, and family members some questions regarding your communication abilities in everyday life. All conversations will be tape recorded so yours and other answers can be transcribed (written) at a later time.

All data collected including tape recordings, test scores, and information regarding age, sex, diagnosis, severity, and date of onset will be held in the strictest of confidence and will be used solely for the purpose of this

study. The tape recordings will be erased on the completion of the study. All other data will be stored in a locked filing cabinet in the office of Dr. Wayne E. Swisher, Chairman of the Department of Communication Disorders for the duration of two years, after which time they will be destroyed. You may have the data once the study is completed, if you wish. If the data is published you will be identified only by age, sex, diagnosis, severity, date of onset of aphasia, and date of testing. Your name will never appear in writing with the information collected. The benefits to you as an individual subject are limited except for the satisfaction that you may derive from participation in this research project.

If you choose to participate in this study, you may withdraw at any time without prejudice. You may, if so desired, have a family member or adult caretaker present with you during the collection of data.

If you have any questions regarding the study or what we will be doing, I will be happy to answer them for you at this time. If questions arise at a later time, you may call me at (701) 746-6726 or (204) 885-5024 and I will be happy to answer them for you. You will be given a copy of this consent form for your own records that you may keep for future reference.

.....

I have read all of the above and willingly agree to participate in this study explained to me by Carla Phillips.

Subject's Signature	Date
Immediate Family Member or Legal Guardian	Date
Witness	Date

APPENDIX B

COMMUNICATION SUBTEST OF THE FUNCTIONAL INDEPENDENCE MEASURE

APPENDIX B

COMMUNICATION SUBTEST OF THE FUNCTIONAL INDEPENDENCE MEASURE

EXPRESSION Includes clear vocal or non-vocal expression of language. This item includes both intelligible speech or clear expression of language using writing or a communication device. Check and evaluate the most usual mode of expression. If both are about equally used, check both V and N.

V = Vocal N = Nonvocal

NO HELPER

7. **Complete Independence** - Expresses complex or abstract ideas clearly and fluently.

6. **Modified Independence** - Expresses complex or abstract ideas in most situations, or with mild difficulty. No prompting is needed. May require and augmentative communication device or system.

HELPER

5. **Standby Prompting** - Expresses basic daily needs and ideas more than 90% of the time. Requires prompting (e.g. frequent repetition) less than 10% of the time to be understood.

4. **Minimal Prompting** - Expresses basic daily needs and ideas 75% to 90% of the time.

3. **Moderate Prompting** - Expresses basic daily needs and ideas 50% to 74% of the time.

2. **Maximal Prompting** - Expresses basic daily needs and ideas 25% to 49% of the time. May use only single words or gestures. Needs prompting more than half the time.

1. **Total Assistance** - Expresses basic daily needs and ideas less than 25% of the time or does not express basic needs appropriately or consistently despite prompting.

Comment: Examples of complex or abstract ideas include, but are not limited to, discussing current events, religion, or relationships with others. Expression of basic needs and ideas refers to the subject's ability to communicate about necessary daily activities such as nutrition, fluids, elimination, hygiene and sleep (physiological needs).

COMPREHENSION Includes understanding of either auditory or visual communication (e.g. writing, sign language, gestures). Check and evaluate the most usual mode of comprehension. If both are about equally used, check both A and V.

A = Auditory V = Visual

NO HELPER

7. **Complete Independence** - Understands directions and conversation that are complex or abstract; understands either spoken or written native language.

6. **Modified Independence** - Understands directions and conversation that are complex or abstract in most situations or with mild difficulty. No prompting is needed. May require a hearing or visual aid, other assistive device, or extra time to understand the information.

HELPER

5. **Standby Prompting** - Understands directions and conversation about basic daily needs more than 90% of the time. Requires prompting (slowed speech rate, use of repetition, stressing particular words or phrases, pauses; visual or gestural cues) less than 10% of the time.

4. **Minimal Prompting** - Understands directions and conversation about basic daily needs 75% to 90% of the time.

3. **Moderate Prompting** - Understands directions and conversation about basic daily needs 50% to 74% of the time.

2. **Maximal Prompting** - Understands directions and conversation about basic daily needs 25% to 49% of the time. May understand only simple questions or statements. Requires prompting more than half the time.

1. **Total Assistance** - Understands directions and conversation about basic daily needs less than 25% of the time or does not understand simple questions or statements or may not respond appropriately or consistently despite prompting.

Comment: Comprehension of complex or abstract information includes, but is not limited to understanding; group conversation, current events appearing in television programs or newspaper articles, or abstract information such as religion, humor, math, or finances used in daily living. Information about basic daily needs refers to conversation, directions, question or statements related to the subject's need for nutrition, fluids, elimination, hygiene, sleep (physiological needs).

APPENDIX C

SUBJECT QUESTIONNAIRE

APPENDIX C

SUBJECT QUESTIONNAIRE

Verbal Modality

1. Tell me about yourself.
2. What is your name?
3. Where do you live?
4. What is your birthdate?
5. Are you married? How long have you been married?
6. Do you have any children?
7. What has the weather been like this summer?
8. Tell me two things you did today.
9. Name your favorite foods.

Writing Modality

1. Write a paragraph describing yourself.
2. Write your name.
3. Write your address.
4. Write your birthdate.
5. Write how many children you have?
6. Describe the weather this summer.
7. Write two things you did today.

8. Write your favorite foods.

9. Write the T.V. shows you watch.

Auditory Modality

1. The researcher will read the subject a short paragraph and ask them to answer some multiple choice questions.

2. Is your name _____?

3. Do you live in Calgary? Do you live in Winnipeg?

4. Are you married?

5. Do you have any children? 1,2,3...?

6. Has there been alot of snow this summer? rain?

7. Do you have blue eyes? brown? green?

8. Do you have brown hair? grey? white? blonde?

9. Tell or show me haw many days are in a week.

Reading Modality

1. The subject will read a short paragraph and then answer a few multiple choice questions.

2. The subject will be shown a cartoon and their reaction will be observed.

3. Show me how many is this? 3,5,2

4. Show me this on you--hand, eye, foot, knee, shoulder

5. Follow the direction--Blink you eye twice

6. Tell me or show me how many eyes a person has.

7. If you have already eaten breakfast, nod your head.

APPENDIX D

SPEECH-LANGUAGE PATHOLOGIST, NURSE, AND FAMILY MEMBER QUESTIONNAIRE FORM

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SPEECH-LANGUAGE PATHOLOGIST, NURSE, AND FAMILY MEMBER QUESTIONNAIRE FORM

Verbal Modality

1. How does _____ usually communicate with you-verbally or with gestures?

2. Does _____ use gestures consistently?

3. Does_____ need to repeat words, use gestures or repeat the entire message in order for the listener to understand their message?

4. How long are his/her messages? One, two, three word utterances, phrases, sentences?

5. Is _____ able to discuss complicated ideas such as current events, relationships with people, and/or plots of television shows?

6. What kinds of things do you normally talk about?

7. Is _____ able to indicate his/her basic needs. For example, can _____ tell you what he/she wants for dinner or if he/she has to go to the bathroom? Name the basic needs that he/she expresses?

8. What percentage of the time does _____ express his/her daily needs. Does he/she express them in one-word answers, sentences or gestures?

Writing Modality

1. Is _____ able to express complex ideas such as current events and/or relationships with people in writing?

2. What kinds of things does he/she write about?

3. Is _____ able to express his/her daily needs in writing? Name the basic needs that he/she writes about.

4. What percentage of the time does _____ express his/her daily needs in writing? Does he/she write in one-word answers, sentences or in any other way? Does _____ require prompting in order to express his/her ideas or needs in writing? Does he/she have to re-write his/her answer or message for it to be understood?

Auditory Modality

1. Is _____ able to understand complicated or abstract verbal directions and conversation? For example, can _____ understand group conversations, current events appearing in television programs, humor, math, or finances used in daily living?

2. Does _____ require the assistance of a hearing aid, other assistive device, or extra time to understand the information?

3. How does _____ indicate that he/she understands what he /she hears? For example, is he/she able to carry out instructions, laugh appropriately at a joke, balance their checkbook, nod their head, or any other indication of auditory understanding?

4. What percentage of the time does _____ understand verbal directions and conversation about basic daily needs? For example, he/she can understand conversation, directions, questions or statements related to their need for nutrition, fluids, elimination, hygiene, sleep _____ % of the time.

5. Is it necessary to reduce the number of words used, repeat sentences, or use gestures in order for him/her to understand the message?

Reading Modality

1. Is _____ able to understand complicated or abstract directions and conversation that are presented visually? For example, does he/she read and understand current events or information in newspapers, books, and /or in the bible?

2. How does _____ indicate that he/she understands what he/she reads?

3. Does _____ require visual aids in order to understand written information?

4. What percentage of the time does _____ understand directions and conversation about basic daily needs that are presented visually? For example, can _____ indicate what he/she wants to eat for dinner from a menu?

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