Loma Linda University
TheScholarsRepository@LLU: Digital Archive of Research, Scholarship & Creative Works

Loma Linda University Electronic Theses, Dissertations & Projects

6-1981

The Norming of the Shortened Form of the Carrow Elicited Language Inventory

Barbara Brown

Follow this and additional works at: https://scholarsrepository.llu.edu/etd

 Part of the Speech Pathology and Audiology Commons

Recommended Citation

Brown, Barbara, "The Norming of the Shortened Form of the Carrow Elicited Language Inventory" (1981). *Loma Linda University Electronic Theses, Dissertations & Projects*. 555.
https://scholarsrepository.llu.edu/etd/555

This Dissertation is brought to you for free and open access by TheScholarsRepository@LLU: Digital Archive of Research, Scholarship & Creative Works. It has been accepted for inclusion in Loma Linda University Electronic Theses, Dissertations & Projects by an authorized administrator of TheScholarsRepository@LLU: Digital Archive of Research, Scholarship & Creative Works. For more information, please contact scholarsrepository@llu.edu.

Abstract

THE NORMING OF THE SHORTENED FORM OF
THE CARROW ELICITED LANGUAGE INVENTORY

by Barbara Brown

The present investigation was initiated to establish cut-off scores for the shortened form of the Carrow Elicited Language Inventory (CELI). With such norms available, the assessment tool might be utilized as an expressive language screening device for the children ages five years nine months through six years nine months who are entering the first grade.

A review of the literature revealed few expressive language screening devices which are practical for use by the speech-language specialist in the schools. Some screening tools available are impractical in length of time to administer, for example the Northwestern Syntax Screening Test requires fifteen minutes for administration and fifteen minutes for scoring and interpretation. Other tests, such as the Jurupa Preschool and Kindergarten Screening (1973) require subjective interpretation, with random cut-off scores chosen at the discretion of the individual speech-language specialist.

The subject sample for the present investigation was comprised of two groups of children selected from the

Fontana Unified School District. The normal group contained thirty subjects, ages five years nine months through six years nine months, who were randomly selected from eleven classrooms. The second group of subjects, the treatment group, consisted of thirty children ages five years nine months through six years nine months, who allegedly had demonstrated expressive language problems as identified by their school speech-language specialists.

The shortened form of the CELI was administered to the children in both groups. Scores were computed to determine the point of discrepancy, that is, the point at which the scores of the two groups overlapped. This area was the point of demarcation, and constituted the norm value for the shortened form of the CELI.

The collected data were cross validated, by administering the original form of the CELI to the normal group of children. Scores from the original and shortened CELI were analyzed to determine if there was a positive correlation beteen the two tests.

A high positive correlation was found to exist between scores on the original and shortened form of the CELI. Results gained from this study indicated that a cut-off score of three or more errors would effectively identify the child with a possible expressive language problem in need of further diagnostic testing.

LOMA LINDA UNIVERSITY

Graduate School

THE NORMING OF THE SHORTENED FORM OF THE CARROW ELICITED LANGUAGE INVENTORY

by

Barbara Brown

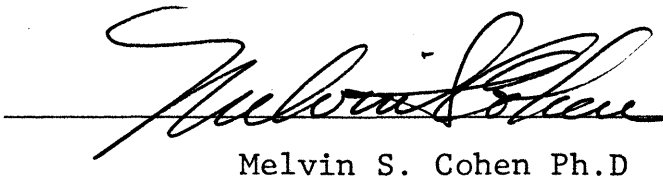
A Thesis in Partial Fulfillment

of the Requirements for the Degree Master of Science

in Speech Pathology and Audiology

June 1981

Each person whose signature appears below certifies that this thesis in his/her opinion is adequate, in scope and quality, as a thesis for the degree Master of Science.



/Chairman

Melvin S. Cohen Ph.D
Associate Professor of Speech-Language Pathology

Charlotte Blankenship M.A.
Assistant Professor of Speech-Language Pathology

Isao Horinouchi Ph.D.
Associate Professor of Gerontology

ACKNOWLEDGEMENTS

The author is most grateful to the many individuals who gave various and invaluable types of assistance to the researcher. Special appreciation is extended to Dr. Melvin Cohen, who served as chairman of the committee, for his wise counsel and consistent advisement. His careful reading of the manuscript as it progressed through various stages contributed significantly in the formulation of this study. Charlotte Blankenship and Dr. Isao Horinouchi shared in this responsibility as members of the research committee. I would like to express sincere thanks to each of these individuals for their time and efforts expended.

The writer is most grateful to Dr. Norman Maberly for the hours he spent in consultating on statistical analysis of the data. Without his assistance the study could not have been possible.

Finally, I am especially indebted to my husband, Gary. His consistent support, encouragement, and guidance has been invaluable to the completion of the study.

TABLE OF CONTENTS

LIST OF TABLES

Chapter I

INTRODUCTION

During the past several decades, professionals responsible for the education of children have observed two simultaneous and closely related trends. The first of these eminates from the increased attention paid by speech-language specialists, linguists, educators, and psychologists to children's development of language. Valuable information concerning the nature of the language learning process and knowledge of characteristics at varying developmental levels is beginning to emerge. Various developmental studies indicate that it is during the preschool years when children develop a general knowledge of the rules which govern their speech and language production.

The second trend pertains to the children who, for some reason, are unable to learn and/or use language for effective verbal communication. This phenomenon specifically manifests itself within groups of children who have expressive language disorders. Early identification and intervention are critical for those children who are exhibiting characteristics of an expressive language problem (Fluharty, 1973).

The speech-language specialist in the school is faced with the task of providing an efficient system which

identifies the relatively small number of language handicapped children from within the total school population. This requires a screening tool which can quickly and reliably be administered to school-age children.

A survey of the literature in the area of language screening tests revealed consistent findings. The administration of most current language screenings require a greater length of time than is practical for the screening of large groups of children. For example, the Northwestern Syntax Screening Test (Lee, 1969) was constructed to identify children between the ages of three and seven years who show possible deficits in receptive and expressive language development and who should receive further diagnostic evaluation. The suggested length of time required to administer this test is from fifteen to twenty minutes, with scoring and interpretation requiring an additional fifteen minutes; this total of thirty-five minutes limits the practicality for large-scale screening projects.

Various screening instruments require subjective interpretation. Many school districts and speech-language specialists have designed their own screening tools which include evaluation of tasks such as rote counting, color identification, word and sentence imitation and identification of common objects (First Grade Screening Test, Fontana Unified School District, 1977). These tests do not necessarily evaluate specific syntactic structures and are scored

subjectively by each speech-language specialist, without established cut-off scores for each age level.

The Carrow Elicited Language Inventory (CELI, Carrow, 1974) is a diagnostic test of expressive language consisting of 52 oral stimuli. Lawson (1978) designed a study to determine whether a shortened or screening form could be developed from the original CELI. Her investigation revealed a high positive correlation (r=.869) between scores from the original and her shortened form of the CELI (Lawson, 1978).

STATEMENT OF THE PROBLEM

It is apparent that a test which is capable of identifying possible expressive language problems in children, with established cut-off scores, may be of value to speech-language specialists involved in large-scale screening projects. Screening instruments which currently exist are either too time consuming to administer and score, or require subjective interpretation of test results.

PURPOSES OF THE STUDY

The purposes of the present study have been (1) to establish pass/fail cut-off scores for the shortened form of the CELI for children entering first grade, and (2) to cross validate those data to verify the validity of the

shortened form of the CELI when administered to children ages five years nine months through six years nine months.

NULL HYPOTHESIS

Stated in terms of the null, it is hypothesized that (1) cut-off scores cannot be established for the shortened form of the Carrow Elicited Language Inventory which will enable the test to be used in a reliable manner to screen first grade children for expressive language problems, and (2) a comparison of scores from the original and shortened forms of the CELI will not yield a statistically significant correlation.

IMPORTANCE OF THE STUDY

School administrators look to the speech-language specialist for direction and consultation in the development of programs for children wth language handicaps (Gillen, 1971). To select children with expressive language problems, screening procedures have been implemented into school programs. These large-scale screening projects usually are strictly limited in the amount of time which can be allocated for the evaluation of each child. The administration and scoring time required by many current screening instruments is not practical for screening large groups of children, and these instruments fail to elicit all areas of language production and are to be subjectively interpreted.

A screening test which assesses the expressive language abilities of the child entering the first grade, with established cut-off scores, is in demand and should be of value to professionals involved with school-aged children. The present study was designed to establish a cut-off score for the shortened form of the Carrow Elicited Language Inventory, which could then be used for screening first grade children to detect those with expressive language deficits.

DEFINITION OF TERMS

Diagnostic Test

A diagnostic test is designed to accurately identify which aspect of communication is defective (Milisen, 1979). It is an in-depth assessment to locate and identify weaknesses in language production.

Expressive Language

Expressive language is the vocalized communication which conveys one's thoughts or feelings (Travis, 1971). It represents a person's ability to formulate and verbalize thoughts and ideas according to linguistic rules.

Normal Group

This group of thirty subjects was randomly selected from eleven classrooms. They were "normal" in the sense that they exhibited normal language functioning.

Screening Test

The purpose of a language screening test is to separate out, for more in-depth testing, those children in a population who exhibit characteristics of expressive language deficiencies (Newby, 1971).

Treatment Group

This group of thirty subjects was selected because they had been identified by their school speech-language specialist as having expressive language deficits.

Chapter II

REVIEW OF THE LITERATURE

A review of the literature published on the subject of language screening tools and their usefulness reflected varied subjective attitudes. Those studies of screening tests which were found to be pertinent to the present investigation will be reviewed.

PURPOSES FOR LANGUAGE SCREENING

Until the early 1970's, the major concern of the speech-language specialist in the schools was in the area of articulatory disorders. As language began to emerge and gain recognition as an area of concern in the field of speech pathology and audiology, the American Speech and Hearing Association (ASHA) "became increasingly aware of the . . . critical importance in providing a broad spectrum of language services" (ASHA, 1979, p. 190). In 1978, it was resolved that the name of the American Speech and Hearing Association be changed to the American Speech-Language-Hearing Association.

Prior to that action, in 1967, the Social Security Act was amended by Congress to require "health" screening for the thirteen million children who were, at that time, estimated to be living in poverty the medical concept of

screening devices for "health" purposes was soon generalized into the area of "screening for mental defects". The initial focus of this mandate was in the areas of intelligence and reading readiness. However, with the advent of programs designed for children exhibiting "impoverished" language, a greater demand has emerged for screening tests which identify speech and language problems (Lynch, 1979). "As the concept of Early Childhood Education spread throughout the country, the need for speech and language screening techniques increased. With the passage of Public Law 94-142 it [the need] can be expected to continue" (Lynch, 1979, p. 250).

EXPRESSIVE LANGUAGE SCREEENING TESTS REVIEWED

The following group of screening tests was selected by the researcher because they pertain to the current study. Each met the criteria of: (1) assessing expressive language performance, (2) having been designed as a screening (not diagnostic) instrument, and (3) having been designed for children within the age range of five years nine months through six years nine months. A list of all tests reviewed in the selection process appears in the Appendix.

The Northwestern Syntax Screening Test (NSST)

This screening tool was originally developed and later revised by Lee (1969, 1971). Receptive and expressive

language areas are assessed and norms have been developed for ages three through seven years. Administration of the test requires fifteen to twenty minutes, with scoring and interpretation requiring an additional fifteen minutes. This time element prohibits its use in large-scale screening projects.

Although a short method of scoring has been described for screening large groups of children with the NSST (1971), there is apparent controversy over the use of the NSST itself. Byrne (1977) stated that the NSST does not meet the necessary criteria to serve as an objective tool to measure deficits in communication. She also reported that task requirements may have confusing results at various ages. The gap which exists between receptive and expressive scores for the younger subjects may be a result of the memory component, which would be more demanding for the younger child. Byrne also asserts that the production task is simply a form of delayed imitation, rather than a measure of spontaneous language skills. Darley and Spiesterbach (1978, p. 143) reported "it has been discovered that many children in day care centers require a longer [administration] time, usually in two sittings, and some fail to understand the [NSST] task."

Standardization of the NSST was performed on a group of children who were from middle and upper middle classes, from one geographic area. This is a consistent criticism of the NSST (Arndt, 1977; Compton, 1980). When 216

children in northern Texas, some from a low socio-economic background, were evaluated with the NSST, the mean scores were significantly lower than would have been expected from Lee's data (Larson and Summers, 1976).

The Meeting Street School Screening Test (MSSST)

The MSSST was designed to identify kindergarten and first grade children with potential learning disabilities. The test manual (1969, p. 49) defines the child with a learning disability as one "whose information processing inefficiencies in the language, visual, perceptual-motor, and motor patterning modalities interfere with learning." The three subtest areas are (1) Motor Patterning, (2) Visual-Perceptual-Motor, and (3) Language. The most limiting factor of the test is that it does not provide information concerning the effects on scores of variables such as age, sex, racial or socioeconomic background (Compton, 1980). This is a significant deficiency for the professional who uses the mean scaled score as a method of identifying children with possible language learning problems.

The language subtest includes tasks of word and sentence repetition, counting, telling a story, and language sequencing. Compton (1980) reports it to be the weakest of the three assessment areas due to the lack of attempted measurement of receptive or expressive vocabulary. It is also questionable that a counting task should receive

priority placement in the language area (Compton, 1980). Separate norms have not been establised for each subtest, so the entire test must be given to derive data. The testing time, fifteen minutes for administration and fifteen to twenty minutes for scoring and interpretation, limits its use as a screening tool for large populations.

The Denver Developmental Screening Test (DDST)

The DDST was designed for use in medical settings (Compton, 1980). It attempts to discover delays in overall development. A delay is defined in the manual as any failed item which is completely below the chronological age of the child being tested.

This concise, clear, and relatively simple tool to administer (Compton, 1980) assesses four areas: (1) Personal-Social, (2) Fine-Motor-Adaptive, (3) Gross Motor, and (4) Language.

Several limiting factors of this instrument apply to the language subtest of the DDST. Hubbel (1979) suggests that most of the language items are representative of semantic information and give little regard to the syntactic abilities of the child being assessed.

Twelve of the twenty language items on the DDST may be passed by the parent's report. A study substantiating the contention that parents tend to vary greatly in their reliability as informants (Frankenburg, van Doornick, Liddel, and Dick, 1976) found that mothers consistently evaluated

their child as being more advanced than did trained personnel evaluating the same child with the DDST.

It has been recommended (Hubbel, 1979) that scores from the Language portion of the DDST be interpreted in association with general developmental levels rather than in terms of a child's specific language problem. Speech-language specialists usually select screening tools which yield additional information concerning a child's expressive language functioning (Hubbel, 1979).

The Bankson Language Screening Test (BLST)

The stated purpose of the BLST is to provide preliminary information about expressive language abilities and specific auditory and visual skills in children (Bankson, 1977). The test generates a profile of the child's performance on seventeen subtests, with emphasis placed upon basic vocabulary and semantic knowledge, morphologic and syntactic structures, and visual/auditory tasks involving matching association, discrimination, memory, and sequencing. Certain stimulus items have been described as confusing. For example, the color on Plate 7 is to be named "purple"; however, most adults judge the color to be black or grey (Koenigsknecht, 1979). Administration and scoring require twenty-five to thirty minutes, which restricts its use in screening large groups of children.

A limiting factor of the BLST is that "it does not assess the common . . . problems with language usage evidenced

by children seen in speech and hearing clinics within the age range for which the test is standardized" (Koenigsknecht, p. 8). While grammatical features are tapped, modals, copulative verbs, reflexive pronouns, and interrogatives are not sampled, and the test items do not elicit language formulation skills (Koenigsknecht, 1979).

Oral Language Sentence Imitation Screening Test (OLSIST)

The OLSIST was developed to determine "whether a child's expressive language skills are within normal limits" (Zachman, Huisihgh, Jorgensen, Barrett, 1977), or if there is a need for the speech-language specialist to initiate further testing. The test has three levels (Stage, III, Stage IV, and Stage V), which correlate with Brown's (1973) theory of language developmental stages. Sentences are elicited through imitation, with morpheme length varying systematically throughout the sentences. Costello (1979) suggests that the test can be more precisely described as an indicator of the child's syntactic knowledge rather than a measurement of the child's expressive functioning as a whole.

The suggested guidelines for interpretation of the OLSIST imply that a child would pass if he made "few" test errors which were dispersed throughout the test. Failure would be indicated by "numerous" test errors. The major flaw in these scoring recommendations is the absence of

objective criteria which would differentiate between "few" and "numerous" errors. The lack of data to indicate whether this tool is sensitive in selecting children with expressive language problems and its subjective scoring system are significant weaknesses of this screening test (Costello, 1979).

Slingerland Screening Tests for Identifying Children with Specific Language Disability

According to the test manual (Slingerland, 1970), the purposes of the tests are to screen from among a group of children (1) those with potential language problems and (2) those with existing language problems. There are three forms of the test, each consisting of eight subtests. Form A is for children in grades one and two, Form B is for children in grades two and three, and Form C is for children in grades three and four. The Individual Auditory Tests, the subtests which probably are most applicable to the speech-language specialist (Stephens, 1971), involve word, sentence, and story repetition tasks.

Recommendations for evaluating the child's test performance are ambiguous and subjective (Stephens, 1979). The author of the test states that a maturational lag or specific language problem may be suspected if a child's performance is poor on the Individual Auditory Tests with no definition supplied for the term "poor". The examiner

is encouraged to note behaviors such as substitutions and sentence length; however, there is neither a system for scoring these behaviors nor are there norms for comparing performance.

The author (Slingerland, 1970) justifies this lack of normative data by reasoning that separate sets of norms would have to be developed to include all socio-economic and ethnic groups. She therefore recommends that users of the Slingerland Screening Tests develop their own local norms to evaluate and compare test performance. Stephens (1979, p. 175) asserts that "emphasizing the need for local norms does not excuse a test developer from analyzing and reporting some normative data", and states that this lack of normative information greatly weakens the test's credibility.

In summary, the current researcher concurs with Lynch's (1979) observation that language screening tests as a group "either fail to provide the minimum data necessary to identify speech-language problems, or run the risk of eliciting a higher number of 'social remarks'". The subjective scoring procedures and the length of time required to administer and score the current language screening tests appear to restrict their use in large-scale screening procedures.

One current investigation which attempted to overcome these apparent limitations was Lawson's (1978) study with the Carrow Elicited Language Inventory (CELI). Her

results demonstrated a high positive correlation between the original CELI and her (Lawson's) shortened form. Lawson's results seem to have provided the initial data needed to solve the problems presented by current screening instruments.

Chapter III

METHODS AND PROCEDURES

SUBJECTS

The design of the present study called for sixty subjects divided into two groups of thirty each. These children represented a cross section of normal intellectual ability and socio-economic background, typical of communities in suburban southern California. In November, 1980, contact was made with the Director of Special Services from the Fontana Unified School District, Fontana, California, for the purpose of obtaining children to serve as subjects for the current investigation. Enthusiastic support was gained and within seven days permission was granted to conduct the study in the Fontana Unified School District.

The following criteria were applied to the subjects in Group I, described as the "normal" group. (1) The child must be between the ages of five years nine months and six years nine months. (2) The child must not have been identified as portraying any sensory (e.g. auditory, visual), intellectual, or language deficits as reported by the classroom teacher and speech-language specialist. Hearing screening programs were conducted at the beginning of the school year, which should have identified those children with

hearing problems. (3) The child must have a consent form signed by a parent or legal guardian, indicating an understanding of the goals, objectives, and activities involved in the testing session. Thirty subjects who met the above criteria, were randomly selected from eleven classrooms. A table of random numbers (Parket, 1974) was utilized in the selection process, to ensure that every child considered would have an equal chance of being chosen.

The second group of subjects was described as the "treatment" group. Criteria for the selection of these children were as follows: (1) The child must be between the ages of five years nine months and six years nine months. (2) The child must not have been identified as portraying any sensory or intellectual deficits as reported by the speech-language specialist. (3) The child must have a consent form signed by a parent or legal guardian, indicating an understanding of the goals, objectives, and activities involved in the testing session. (4) The child must exhibit an expressive language problem as identified by the speech-language specialist in the school.

MATERIALS

The original form of the Carrow Elicited Language Inventory (CELI, Appendix), consisting of fifty-one sentences and one phrase, was administered to each subject in the

normal group. The shortened form of the CELI, which contained contained eight sentences selected from the original CELI for their high discriminating power (Lawson, 1978, Appendix), was administered to the subjects in both groups.

PROCEDURES

Each subject was assessed individually while seated directly in front of the researcher. Prior to the administration of the test, the following instructions were given to each child in both groups, as recommended by Carrow (1974, p. 11).

> "We are going to play a game and this is how we play it. I am going to say some words; when I stop, I want you to say the same thing I said. Some of the things I say will be very easy and some will be hard. Just do your best. Let's try some words to see if you understand."
>
> Examiner: "I like candy."
> Response: "I like candy."
> Examiner: "Mother went to the store."
> Response: "Mother went to the store."

If a subject did not appear to understand the task and did not attempt to repeat the sample sentences, the instructions were restated until the child attempted to perform the task. After the instructions were given and the child repeated the examples, a General Electric cassette tape recorder, model number 3-5103A, was turned on and the test sentences were orally presented. Each child's responses were later transferred onto matrix sheets for scoring purposes.

The subjects in the normal group were first given the original form of the CELI. Following the administration of the fifty-two sentences, was a rest period which consisted of a short conversation with each subject about such topics as Christmas vacation, favorite pets, and school subjects. Administration of the shortened form of the CELI was then completed. The children in the treatment group were tested with only the shortened form of the CELI.

The original form of the CELI was scored according to Carrow's (1974) criteria, with productions placed onto a matrix sheet which classified the various grammatical forms. The shortened form of the CELI was scored according to Lawson's (1978) recommendations. Sentences were scored "incorrect" if the child repeated any word incorrectly (omitted, added, or transposed any word in the stimulus sentence). Sentences were scored "correct" if the entire sentence was repeated correctly. This plus or minus procedure for scoring greatly reduced the amount of time required for scoring, thus adding to its practicality for use as a screening tool (Lawson, 1978).

Chapter IV

RESULTS

The present study was designed to establish cut-off scores for the shortened form of the Carrow Elicited Language Inventory (CELI). Two groups of thirty subjects each, ages five years nine months through six years nine months, were evaluated with the shortened form of the CELI. Scores from the normal group and scores from the treatment group were computed to determine a cut-off score which would discriminate between the two groups of children.

ANALYSIS OF DATA

Mean Scores and Standard Deviations

Means and standard deviations were computed for scores from the shortened CELI. The mean score for the normal group was 1.3 errors, interpreted as the average number of statements scored "incorrect" for this population. The standard deviation for this group was 1.5. On a scale of eight possible points, this would not be an unusual expectation (Interview, 1981).

The treatment group acquired a mean score of 4.4 sentences repeated "incorrectly". The standard deviation for this group was 2.3. This is a larger standard deviation

indicating that the scores from this population were more widely dispersed.

t-Test

In order to test for the significance of the difference between the mean scores of the two groups (1.3 and 4.4) a simple t-test was applied. The t-test findings were significant at the .001 level. Interpreted, this means that the probability is less than 1 in 1,000 that the difference between the two groups is the product of random chance. Therefore, since the groups were preselected on expressive language criteria, the mean difference rejects the null hypothesis that the shortened form of the CELI is not able to successfully discriminate between the groups.

Discrimination Coefficients and Difficulty Index

In organizing the data to determine the coefficients of discrimination and the difficulty index, the bottom ten per cent of the normal group scores was deleted to purify the sample. The deletion was to eliminate the possible inclusion of language disordered scores that many have existed in this group. The top ten per cent of the scores was taken out of the treatment group to eliminate the possibility of mis-diagnosis or inappropriate referrals, again assuring a pure sample of children with expressive language deficits, with no overlap.

"It has been shown that the discriminative power of an item is most accurately determined when item analysis is based on the top and bottom 27% rather than some other percentage of the distribution" (Garrett, p. 367). Therefore, the data from the two groups were combined, with the highest score ranking on the top to the lowest score being on the bottom. The following table represents the distribution of the top and bottom 27% of the scores for each item on the shortened form of the CELI.

TABLE 1

Results of Item Analysis

Sentence	Top 27%	Bottom 27%	Bi-Serial Coefficients	Difficulty Index
1	100%	46.6%	.70	.73
2	100%	20.0%	.81	.60
3	100%	20.0%	.81	.60
4	93%	26.6%	.71	.60
5	93%	26.6%	.71	.60
6	93%	13.3%	.76	.53
7	93%	6.6%	.84	.50
8	100%	0.0%	1.00	.50

Sentence number eight had the highest correlation at 1.00, inferring that this item discriminated between the upper and lower groups with 100% accuracy. In contrast, sentence number one had the lowest discriminating power, with a correlation of .70, which also is indicative of a significant high positive correlation.

The difficulty index indicated the percentage of subjects from both groups who were able to correctly repeat each item. As Garrett states, "Other things being equal, items of moderate difficulty (40-50-60% passing) are preferred to those which are much easier or much harder" (p. 363). Test item number one was the least difficult (.73) meaning that 73% of the total population repeated the item correctly. The remaining items fell within this aforementioned "preferred" range.

Pearson Product Correlation

In the cross validation portion of this study, scores from the shortened CELI were compared with scores from the original CELI. Results reflected a high positive correlation between respondents' performances on the two tests ($r=.82$). This suggests that the two instruments are ranking the subjects in much the same order with respect to the factor being measured. The coefficient of determination (r^2) indicated that the proportional overlap is 67%. That is, 67% of the variance is due to common factors in both tests which identify language functioning. Conversely, 33% of the traits being measured are related to unknown factors that are not common to the two tests. There is two-thirds probability that the two tests are measuring the same factors.

Cut-off Scores

To establish an appropriate cut-off score which would identify the point of demarcation between the normal group and the treatment group, the following procedures were followed. The number of items missed was computed into percentages for the treatment and normal groups. The following table represents percentage of errors for items in each group.

TABLE 2

Percentage of Errors

Number of Errors	Normal Group	Treatment Group
8	0.0%	13.3%
7	0.0%	10.0%
6	3.3%	10.0%
5	0.0%	16.7%
4	6.7%	10.0%
3	10.0%	10.0%
2	10.0%	20.0%
1	33.3%	10.0%
0	36.7%	0.0%

In the normal group of subjects, none of the population missed all eight items. In contrast, 13.3% of the subjects from the treatment group missed all eight items. Total scores from each group were computed and percentages tabulated.

The criterion for selecting a cut-off score was to identify the score with the least difference between the

percentages of error that existed in both groups. This was a score of three errors.

Results from these computations indicated that this screening tool clearly identifies the two extremes. It discriminates well between those children with no expressive language problems and those children with severe expressive language problems. The percentages in the middle range are not clearly identified. "A danger of all prediction instruments is the possibility of missing some of the children in this 'middle' range" (Interview, 1981), in this case those with mild expressive language problems.

Chi-Square

Given the collected data, a cut-off score of three errors was used to divide the treatment from the normal group. The resulting chi-square was 14.359, which has a significance of .0005. This can be interpreted as meaning that in less than one chance in 5,000, group membership is independent of test performance. A cut-off score of three or more errors is "failing", and would indicate that further diagnostic testing is necessary. This cut-off score of "three" errors effectively separated the normal group from the treatment group. This finding was consistent with the discriminating indexes.

Chapter V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS FOR FURTHER STUDY

SUMMARY

Screening tools which identify children who present expressive language problems have received attention with the increased interest paid to children with communicative disorders. Many of these instruments, however, have been found to be too time consuming to administer, and/or they lack objective, standardized procedures for interpretation.

A shortened form of the Carrow Elicited Language Inventory (CELI) was developed to enable speech-language specialists in the schools to screen large numbers of children for possible expressive language deficits (Lawson, 1978). This investigation was designed to establish a cut-off score for the shortened form of the CELI, which would be sensitive in selecting those children with expressive language problems, and passing those children with normal expressive language skills.

Two groups of subjects, ages five years nine months through six years nine months, participated in the experimental study. The normal group, randomly selected from eleven classrooms, consisted of thirty children who had been

reported to have normal language functioning. The original and shortened forms of the CELI were administered to these children. The treatment group, consisting of children who had been identified by their school speech-language specialist as having "expressive language" problems, were evaluated only with the shortened CELI.

RESULTS

A bi-serial coefficient study, applied to the collected data, indicated that each of the eight sentences from the shortened Carrow Elicited Language Inventory (CELI) had a highly significant positive correlation. These results indicated that the items were accurate in discriminating between the two experimental groups.

The difficulty index, showing the difficulty or easiness of each test item, conformed to the recommended criterion (Garrett, 1966) for seven of the eight items. These items fell within the preferred range of "moderate difficulty".

Results from a Pearson Product Moment Correlation study reflected a high positive correlation ($r=.82$) between the subjects' scores on both original and shortened forms of the CELI. These results provided evidence that the two instruments were ranking the subjects in the same order, and were effectively measuring the same factors.

To establish a cut-off score which would identify a child having an expressive language problem, the number of items scored "incorrect" was computed into a percentage for each group. The cut-off score was determined to be at the point at which the two groups' percentages converged. This point of least overlap was three errors, indicating that if a child missed three or more test sentences he/she "failed" and further testing would be necessary. "Passing" would be indicated by achieving two or less errors on the shortened form of the CELI.

The resulting computations revealed that this screening tool clearly identified the two extremes. It "failed" those children with marked expressive language problems and "passed" those children with no language problems.

The middle range was not as clearly distinguishable. Ten per cent of the treatment group missed fewer than the designated cut-off score of three errors (i.e. two errors or one error). This apparent weakness of prediction tools is addressed by Cooper as he states, "although it is always desirable to improve the efficiency of screening techniques, it is unlikely that their efficiency will ever reach 100%" (1971, p. 214).

A probable explanation for the finding that nine subjects in the treatment group produced fewer than three errors was that all children in the treatment group were

made prior to September, 1980. This tends to indicate that the information may not have been representative of the current language functioning of the child. The eighth subject's speech-language specialist could not be contacted. The ninth subject's speech-language specialists had in fact used an objective measurement to reach her diagnosis. The overlap in scores cannot be fully explained without further research which consistently used objective tools to assess expressive language skills.

Study in the area of language disorders is relatively new to the field of speech pathology; therefore, the term "expressive language problem" appeared to elicit various definitions for some of the school speech-language specialists involved in the current investigation. This was reflected by the various children who were referred by the school speech-language specialists, and screened by the researcher. Children exhibiting severe articulatory disorders, cleft palates, stuttering behaviors, and problems with pragmatics were referred, but not utlized in this study, when in fact children with expressive language problems were requested.

The results of the present investigation reject the null hypothesis that it would not be possible to establish cut-off scores for the shortened form of the CELI, and that the scores from the original and shortened CELI, when compared, would not yield a high significant correlation.

This study provides evidence that, when using the shortened CELI for screening students entering the first grade, a cut-off score of three or more errors would indicate "failing", thus identifying children with possible expressive language problems. It appears that this instrument could be beneficial to the school speech-language specialists who are in need of an objective expressive language screening tool which can be administered in a short period of time.

RECOMMENDATIONS FOR FURTHER STUDY

The results of this investigation suggest several important directions for further study. With the apparent need for screening tools which objectively identify children having expressive language problems, cut-off scores for the shortened form of the Carrow Elicited Language Inventory (CELI) may be useful for screening programs surrounding the first-grade level. Therefore, a similar study with kindergarten and second grade students is recommended. Current, objective measurements should be employed by the researcher to determine the present language functioning of the subjects before assigning them to the "normal" or "treatment" group.

Finally, an additional area of interest related to the present study involves the definition and identification of an "expressive language" handicap. It may be beneficial to survey speech-language specialists to determine their accuracy in identifying an expressive language deficit in

students. Pertinent questions may include whether speech-language specialists are current in their skills for identifying language disorders in children, and which objective instruments are being used to identify and diagnose expressive language problems in students.

BIBLIOGRAPHY

Bankson, N.W., Bankson Language Screening Test. Baltimore: Press, 1977.

Barton, S.J., "Del Rio Language Screening Test, English/ Spanish." Evaluation of Appraisal Techniques in Speech and Language Pathology. ed. Frederic L. Darley. Menlo Park, CA: Addison-Wesley Publishing Co., 1979.

Buros, O.K., ed. The Sixth Mental Measurement Yearbook. Highland Park: The Gryphen Press, 1965.

Byrne, M.C., A clinician looks at the Northwestern Syntax Screening Test. Journal of Speech and Hearing Disorders, 42, 316-319 (1977).

Carrow, E., Carrow Elicited Language Inventory, Austin, Texas: Learning Concepts (1974).

Cole, P.R., et al, Association Advisory Committee. The Journal of American Speech-Language-Hearing Association, 21 (March, 1979), 190.

Costello, J.M., "The Oral Language Sentence Imitation Screening Test (OLSIST) and The Oral Language Sentence Imitation Diagnostic Inventory." Evaluation of Appraisal Techniques in Speech and Language Pathology. ed. Frederic L. Darley. Menlo Park, CA: Addison-Wesley Publishing Co., 1979.

Darley, F.L., and D.C. Spriesterbach, Diagnostic Methods in Speech Pathology. New York: Harper and Row, 1978.

Divoky, D., Is this screening test worth $1,319,638.50? Learning, May (1977b).

Fluharty, N.B., The design and standardization of a speech and language screening test for use with preschool children. Journal of Speech and Hearing Disorders, 39, 75-88 (1974).

Fontana Unified School District, First Grade Screening Test. 1977.

Frankenburg, W.K., et al, Denver Development Screening Test, Denver: LADOCA Project and Publishing Foundation (1975).

Garrett, H.E., Statistics in Psychology and Education. New York: David McKay, 1966.

Gilbert, S.F., Early childhood education for the developmentally delayed: diagnosis, intervention, and evaluation. Language, Speech, and Hearing Services in Schools, 10, 81-92 (1979).

Gillen, R., "Preparation in Speech Pathology: Matter and Matrix." Handbook of Speech Pathology and Audiology. ed. Lee E. Travis. New York: Appleton-Century-Crofts Educational Division Meredith Corporation, 1971.

Hainsworth, P.K. and M.L. Siquland, The Meeting Street School Screening Test, Providence, RI: Crippled Children and Adults of Rhode Island, Inc., (1969).

Hubbell, R.D., "Denver Developmental Screening Test (DDST)." Evaluation of Appraisal Techniques in Speech and Language Pathology. ed. Frederic L. Darley. Menlo Park, CA: Addison-Wesley Publishing Co., 1979.

Interview with Norman Maberly, Ph.D., Loma Linda University, Riverside, California, March 9, 1981 and April 2, 1981.

Jurupa School District, Preschool and Kindergarten Screening. 1973.

Koenigsknecht, R.A., "Bankson Language Screening Test (BLST)." Evaluation of Appraisal Techniques in Speech and Language Pathology. ed. Frederic L. Darley. Menlo Park, CA: Addison-Wesley Publishing Co., 1979.

Larson, G.W. and P.A. Summers, Response patterns of preschool-age children to the Northwestern Syntax Screening Test. Journal of Speech and Hearing Disorders, 41, 486-497, (1976).

Lawson, J.L., "Development of a Short Form for The Carrow Elicited Language Inventory." Thesis Loma Linda University 1978.

Lee, L., Northwestern Syntax Screening Test, Evanston, IL: Northwestern University Press (1969, 1971 revised).

Lynch, J., Use of a prescreening checklist to supplement speech, language, and hearing screening. Language, Speech, and Hearing Services in Schools, 10, 249-257 (1979).

Milisen, R., "Methods of Evaluation and Diagnosis of Speech Disorders." Handbook of Speech Pathology and Audiology. ed. Lee E. Travis. New York: Appleton-Century-Crofts Educational Division Meredith Corporation, 1971.

Milisen, R., "The Incidence of Speech Disorders." Handbook of Speech Pathology and Audiology. ed. Lee E. Travis. New York: Appleton-Century-Crofts Educational Division Meredith Corporation, 1971.

Monsees, E.K., and C. Berman, Speech and language screening in a summer Headstart program. Journal of Speech and Hearing Disorders, 33, 121-126 (1968).

Newby, H.A., "Clinical Audiology." Handbook of Speech Pathology and Audiology. ed. Lee E. Travis. New York: Appleton-Century-Crofts Educational Division Meredith Corporation, 1971.

Parket, R.I., Statistics for Business Decision Making. New York: Random House, 1974.

Siegal, G.M., The use of language tests. Language, Speech, and Hearing Services in Schools, 6, 211-217 (1975).

Singh, S. and J. Lynch, Diagnostic Procedures in Hearing, Language and Speech. Baltimore: University Park Press, 1978.

Slingerland, B., Slingerland Screening Tests for Identifying Children with Specific Language Disability, Cambridge, Mass.: Educator's Publishing Service, Inc. (1970).

Stephens, I.M., "Slingerland Screening Tests for Identifying Children with Specific Language Disability." Evaluation of Appraisal Techniques in Speech and Language Pathology. ed. Frederic L. Darley. Menlo Park, CA: Addison-Wesley Publishing Co., 1979.

Travis, L.E., ed. Handbook of Speech Pathology and Audiology. New York: Appleton-Century-Crofts Educational Division Meredith Corporation, 1971.

Waryas, C.L., "Northwestern Syntax Screening Test (NSST)." Evaluation of Appraisal Techniques in Speech and Language Pathology. ed. Frederic L. Darley. Menlo Park, CA: Addision-Wesley Publishing Co., 1979.

Zachman, L., et al, The Oral Language Sentence Imitation Screening Test, Moline, IL: Linguasystems, Inc. (1976, 1977).

APPENDIX A

BIBLIOGRAPHY OF TESTS REVIEWED

Bankson, N.W., Bankson Language Screening Test, Baltimore, MD: University Park Press (1977).

Carrow, E., Carrow Elicited Language Inventory, Austin, TX: Learning Concepts (1974).

Carrow, E., Screening Test for Auditory Comprehension of Language, Boston: Teaching Resources Corporation (1973).

Compton, A.J., Compton Speech and Language Screening Evaluation, San Francisco: Carousel House (1978).

Frankenburg, W.K. et al, Denver Developmental Screeing Test, Denver: LADOCA Project and Publishing Foundation, Inc. (1975).

Hainsworth, P.K., and M.L. Siqueland, The Meeting Street School Screening Test, Providence, RI: Crippled Children and Adults of Rhode Island, Inc. (1969).

Horstmeier, J.D.M., Environmental Pre-Language Battery, Columbus, OH: Charles E. Merrill Publishing Company (1978).

Lee, L.L., Northwestern Syntax Screening Test, Evanston, IL: Northwestern University Press (1969, 1971).

Mechan, J., et al, Screening Speech Articulation Test, Salt Lake City: Communication Research Associates, Inc. (1970).

Rodgers, W.C., Picture Articulation and Language Screening Test, Salt Lake City: Word Making Productions (1976).

Slingerland, B.H., Slingerland Screening Tests for Identifying Children with Specific Language Disability, Cambridge, Mass.: Educators Publishing Service, Inc. (1970).

Toronto, A.S., et al, Del Rio Language Screening Test, English/Spanish, Austin, TX: National Education Laboratory Publishers, Inc. (1975).

Zachman, L., et al, The Oral Language Sentence Imitation Screening Test, Moline, IL: Linguisystems, Inc. (1976, 1977).

APPENDIX B

CARROW ELICITED LANGUAGE INVENTORY
STIMULUS SENTENCES

1. Big girl.
2. Cats jump.
3. The boy runs or plays.
4. Cats want to be chased.
5. Have you been gone?
6. They did run fast.
7. Tell everyone what I want to do.
8. The train bumps the car.
9. No one has a ball.
10. Both balls are bigger than hers.
11. The big green ball is mine.
12. The girl is not happy where she lives.
13. I am not going to play.
14. Bill isn't coming to school.
15. That's not a baby, is it?
16. The children don't play, do they?
17. The girl can't go outside.
18. He doesn't like whatever we've written.
19. They do not want to go.
20. The boy is jumping because it's fun.
21. Bill knew how to fix it.
22. Couldn't Daddy have been coming?
23. The man likes painting by himself.
24. She has been running.
25. The lady will sit down.
26. Mother has seen the paper.
27. She would have liked to go.
28. They dog is up in the tree.
29. He puts the paper down.
30. The tree is between the houses.
31. The dog is under the house.
32. They are playing games.
33. Mother gave the ball back to her.
34. Whose puppy is black and white?
35. Those toys may have been mine.
36. The next house is the last.
37. You run to the store now.
38. Where are the dolls?
39. Why is the doll broken?
40. Do the boys like their bike?
41. Will he jump on the car?
42. Didn't the man see the book?
43. Doesn't Lassie play with you?
44. Why didn't she stand up?
45. The boy is chased by the dog.
46. The train is bumped by the car.
47. She showed the girl the boy.
48. Bring me the car that is on the chair.
49. The car stopped before I could call.
50. Daddy asked me to read my book.
51. Mother told me to play in the house.
52. If it rains, we won't go to the beach.

APPENDIX C

CARROW ELICITED LANGUAGE INVENTORY SHORTENED FORM STIMULUS SENTENCES

1. Have you been gone?
2. The big green ball is mine.
3. The girl is not happy where she lives.
4. Bill isn't coming to school.
5. They do not want to go.
6. The man likes painting by himself.
7. Do the boys like their bike?
8. If it rains, we won't go to the beach.