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Development of a Short Form for the Carrow Elicited Language Inventory

Janet Lee Lawson

Abstract

DEVELOPMENT OF A SHORT FORM FOR
THE CARROW ELICITED LANGUAGE INVENTORY

by Janet Lee Lawson

This investigation was designed to determine if a shortened or screening form could be developed for use with the Carrow Elicited Language Inventory (CELI) at the first grade level. The sample for this research was comprised of fifty-six children between the ages of 5 years 9 months and 6 years 9 months. The children were chosen according to availability and time factors and came from middle socio-economic backgrounds.

All subjects were tested with the CELI. After selection of items for the short form, each child's score on the short form was compared with his score on the CELI with the use of two scoring procedures. The first method was the use of the same scoring procedure developed for the CELI. The second method of scoring the short form made use of a simple right or wrong scoring procedure.

The results of this investigation indicated a strong correlation between scores on the CELI and those on the short form for both scoring procedures. However, a stronger correlation did exist for scores on

the short form which were gained according to the instructions in the manual for the CELI.

As the CELI set cut-off scores at the lower tenth percentile, it was decided to use this same procedure with the short form which used the right or wrong method of scoring also. A child would not pass the short form using this method of scoring if he missed 5 or more questions. No cut-off scores were set for the short form using the method of scoring patterned after the CELI as it was felt this form was much less efficient.

From the results gained in this study, it is indicated that a shortened form of the CELI could be developed for use with all ages represented on the CELI. One method of approach might be to make use of the same short form that was developed for the first-grade level and use different cut-off points for other ages.

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DEVELOPMENT OF A SHORT FORM FOR THE CARROW ELICITED LANGUAGE INVENTORY

by

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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.

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CHAPTER I

THE NATURE AND SCOPE OF THE PROBLEM

Traditionally, in order to obtain specific data regarding a child's level of speech and language development, one had to obtain a spontaneous speech sample. This method has been found by many speech specialists to be time consuming and somewhat difficult.

Although free speech sampling provides a wide variety of information, the examiner often spends much of the sampling time interacting with the child in an attempt to obtain specific speech forms. It is unlikely that within a reasonable time limit a sampling of all grammatical forms will be elicited. For example, present and present progressive verbs would be much more likely to occur than verbs of the past progressive form. If a specific form is not elicited, it is difficult to know if the form is in fact absent from the child's language or if it simply was not sampled. Since it is unlikely that all grammatical forms will be elicited during the original sampling, it is difficult to make accurate comparative judgments when a second sample is obtained. This lack of standardized procedures for eliciting free speech samples greatly reduces test-retest reliability of the samples.

Despite these limitations, some authors (Lee and Canter, 1971) have felt that free speech sampling is necessary for accurate

information due to the grammatical "load" conversation places on speech. Other authors (Luterman and Bar, 1971; Menyuk, 1964) have expressed the belief that the same type of information that is elicited during free speech sampling can be obtained through different methods which require less time, are standardized and have a high test-retest reliability. One such method is the sentence imitation procedure. McNeill (1970, p. 13) stated that "a child produces in imitation only what he produces in spontaneous speech, which means that imitation can be used to study children's productive capacities. . . ."

Although sentence imitation procedures have previously been used to study language disordered children (Luterman and Bar, 1971), the development of the Carrow Elicited Language Inventory (CELI) (Carrow, 1974) has provided examiners with the most systematic and in-depth method of sampling language production through sentence imitation. This test provides an efficient yet reliable method of obtaining information concerning a child's expressive language. The test includes items representing a wide range of grammatical complexity. In this way, Carrow has attempted to eliminate some of the problems involved with speech sampling techniques.

While the CELI is a valuable diagnostic tool and does reduce some of the problems encountered with obtaining a free speech sample, the scoring procedure is time consuming. If a child is known to have an

expressive language deficit, the CELI would be useful in assessing specific areas needing remediation. However, the present form is too long for use as a screening instrument with large numbers of children, when it is not known if expressive language difficulties are present or if it is questionable whether an expressive language problem is severe enough to warrant in-depth testing.

Many diagnostic tests include a shortened form which enables the examiner to identify those children in need of additional testing; however, no such form is currently available for the CELI. Diagnostic tests which include a shortened form are particularly helpful to those professionals in the school setting who are in need of screening materials which will quickly and accurately separate those children with language difficulties from those who are not experiencing difficulties. They also enable the user to identify specific areas of language difficulty which will require additional testing without first administering a complete battery of tests in all areas of language.

THE PROBLEM

In the present investigation, a short form of the CELI was developed for use with children at the first-grade level. This short form may be especially helpful when a child is referred for language testing with no mention of a specific problem area included in the referral.

Based on the results of the short form of the CELI, the clinician can determine if the child has expressive language difficulties and is in need of additional diagnostic testing.

The Problem Statement

The problem for this investigation was composed of two parts. Part 1 was to develop a shortened form of the Carrow Elicited Language Inventory for use with first-grade children. The second part of the investigation was to determine if the validity of the short form was adequate for predicting the overall performance of first graders on the total CELI.

Limitations and Delimitations

As most screenings and referrals occur within the first few weeks of the new school year, the average age of first-grade children is somewhat lower than later in the year. Therefore, this investigation was limited to those first graders between the ages of 5 years 9 months and 6 years 9 months. The use of these age levels accounted for those children who were not six before entering first grade, as well as those who turned six after the prescribed cut-off date and were required to wait until the following year to enter school. Children who met the age requirements were chosen from normal classrooms.

The design of the study called for a comparison or correlation of intra-subject scores on the short form with scores on the long form. Since the research sample did not actually administer the short form independent of the long form, the results have provided only an estimate of validity that will need further verification under more normal standardized administration procedures.

A more traditional validity study might seek a second sample to whom the short and long forms could be administered independent of each other. However, under this plan, the limitations of repeated testing would remain. Even with a counterbalanced design such a study would present a restriction that is none-the-less problematical than that occurring in the design of this research. Therefore, in the interest of efficiency and convenience, the study was limited to one sample only, with the interpretational cautions kept in mind.

HYPOTHESIS AND ASSUMPTIONS

Hypothesis

It will be possible to develop a short form of the CELI which will yield scores with a high positive correlation to scores on the long form of the CELI when administered to first-grade children.

Assumptions

It was assumed that a child's level of performance on sentence imitation tasks provided a representative sample of his free speech production. It was also assumed that a correlation greater than .60 had sufficient predictive usefulness for the purpose of identifying children with expressive language difficulties. The error of estimate in values below .60 would decrease the reliability of predictions beyond acceptable limits.

Another basic assumption important to validity studies was that the criterion test had established validity of its own for the purposes designated. Unless it could be assumed that the CELI has an acceptable level of diagnostic usefulness, there would be no point in equating a short instrument with it.

It was also assumed that any observed correlation between short and long forms would represent a predictive relationship rather than a simple, incidental, non-predictive association.

DEFINITIONS OF TERMS

Elicited Imitation

Elicited Imitations are those attempts by the child to repeat model sentences or phrases following the examiner's request to "say what I say."

Diagnostic Test

A test designed to locate the particular source of a person's difficulties in learning, thus providing clues to what further measures of instruction, guidance, or study are needed.

Expressive Language

Expressive language refers to the ability to communicate one's thoughts and ideas through active control of those grammatical features and linguistic rules which have been acquired.

First Grader

A child who is currently enrolled in a first grade class and is between the ages of 5 years 9 months and 6 years 9 months is considered to be a first grader.

Linguistic Competence

Linguistic competence refers to one's ability to understand and speak a language by knowledge and use of intricate and highly complex sets of rules which constitute the grammar of the language.

Normal

A child is considered normal if he is capable of benefitting from a regular classroom setting.

Reliability

A measure of the accuracy of a test or measuring instrument, obtained by measuring the same individual twice and computing the correlation of the 2 sets of measures.

Screening Test

A quick testing procedure which samples a child's abilities in a specified area. It is administered to determine if a problem does exist in the area specified and if additional diagnostic testing is required.

Spontaneous Speech Sample

In a free speech sample an attempt is made to elicit at least 50 consecutive, complete utterances which are representative of a child's language capabilities. This method utilizes play-type stimulus materials and interaction with the examiner.

Validity

As applies to the present study, a correlation greater than .60 has sufficient predictive usefulness for the purpose of identifying children with expressive language difficulties.

CHAPTER II

REVIEW OF THE LITERATURE

The literature which has been published on the subject of free speech sampling and the predictive usefulness of procedures such as sentence imitation is varied and somewhat divergent in its views. Many aspects of free speech sampling and sentence imitation procedures have been considered and will be reviewed briefly.

FREE SPEECH SAMPLING

Free speech sampling appears to be one of the major means of assessing developmental levels of grammatical forms. Among the various methods in use, the Developmental Sentence Scoring (DSS) procedure, revised by Lee (1974), seems to be the most common. Lee and Canter (1971) devised the DSS technique as a method of evaluating language disorders, planning remedial procedures and assessing progress. This method involves the analysis of a spontaneous, tape-recorded, speech sample containing 50 consecutive, complete utterances to estimate the extent to which a child has generalized the grammatical rules of his speech.

Lee and Canter (1971, p. 337) have stated that:

> The DSS technique is, admittedly, a time-consuming, painstaking procedure. There is room for error both in transcribing and

> in scoring, and caution should be used in judging a child's overall language development on the basis of any single speech sample. Furthermore, the usefulness of this procedure is dependent upon the clinician's skill in eliciting a representative sample of a child's grammatical performance in a conversational setting.

According to Lee (1970), use of grammatical forms is often inconsistent between children as well as being inconsistent within a child's own development. She feels many developing structures contain early immature forms with more difficult forms developing later. For example, a young child's speech might contain both "ran" and "runned" when the past tense form is developing. Therefore, Lee feels that the slow and inconsistent emergence of grammatical forms is one of the chief characteristics of children's language development.

Lee (1974, p. 56) also stated:

> When the grammatical load of a sentence becomes too great or when vocabulary is not easily retrieved, some of the rules which have not yet become automatic may be omitted. Thus, a child may show inconsistent use of any particular grammatical form, but at the same time a measurable grammatical load on a representative set of spontaneous utterances may show an overall increase in his ability to handle combinations of grammatical rules.

While Lee and Canter (1971) feel an adequate sampling of grammatical ability may be obtained from 50 complete, different, consecutive responses, others (Johnson and Tomblin, 1975) have found that "The standard error of measurement data for the DSS total indicated that a sample size of approximately 175 sentences must be collected before the standard error of measurement drops below 2.43 score points."

These results indicate that a very large sample is necessary before even a limited reduction in error can be achieved.

Although Johnson and Tomblin (1975) felt the DSS method was useful, they also felt it was not practical at all times. They reported that it was not as useful for separating language disordered children from those with normal language as it was for isolating specific areas of language difficulty.

Sharf (1972) investigated relationships between language measures based on verbal output and those based on structural analysis by longitudinally analyzing the early language development of 13 children. Seven recordings were made of eight boys and five girls with the average age at the beginning of the investigation being 21 months. It was found that sample to sample variations did occur. Several samples taken at two to four-month intervals were needed before adequate growth in language abilities could be determined. It was also felt that a child could develop language in a normal pattern and yet not fit the norms for his age. The authors concluded that before normal development can be determined adequately there should be at least two language samples taken at intervals which will reflect rate of growth.

Engler, Hannah and Longhurst (1973) felt that recording samples of speech is more difficult than it might appear to be. In their comparison of four methods of analyzing speech samples, they

discovered several things which can affect the type of sample obtained. It was felt that the sample must be representative and free from the investigator's biases. It was found that direct interviewing can miss significant parts of speech usage and that a large number of "answer patterns" can exclude other patterns of speech. The subject of presented pictures may also restrict the production of speech during sampling.

Sentence Imitation

Although Lee and Canter (1971) based their development of the Developmental Sentence Scoring method on the idea that the "grammatical load" of a spontaneous speech sample is necessary for accurate information, others (Luterman and Bar, 1971; Carrow, 1974) have suggested that sentence imitation can be used to gain valuable and accurate information regarding a child's grammatical system. McNeill (1968, p. 53) stated that no matter how strong the tendency is for children to imitate speech they receive from their parents, they will not imitate the appropriate features unless important parts of the syntax have already been acquired into their receptive language system.

In an investigation of grammatical capacity in children, Menyuk (1963) discovered that differences in ability of children to repeat sentences seem to be dependent on the particular rules used to generate sentences rather than sentence length. She also discovered

that when given sentences which contain some deviation from complete grammaticalness, the children reproduced those sentences in their correct grammatical form.

In a later study, Menyuk (1964) used the generative model of grammar to compare the language of children diagnosed as using "infantile speech" with the language of children using normal speech. Subjects were required to repeat a list of sentences containing exemplars of various transformation types as well as ungrammatical forms. The results indicated that both in use and repetition of syntactic structures, based on the model of grammar used for analysis, those with deviant speech formulated sentences with the most general rules whereas those with normal speech differentiated rules to generate syntactic structures at higher levels.

Freedle, Keeney and Smith (1970) investigated whether children's tendencies to delete function words and inflections of nouns and verbs in an imitation task can be attributed solely to such factors as relative lack of stress and low-information value. It was discovered that a limited memory span did not account for the deletion of function words and inflections did not adequately explain the patterns of errors made in children's imitations.

Scholes (1969) presented citation-form word strings of various types to adults and children. Errors in imitations were then noted and

analyzed. He also observed that relative stress may not explain children's deletion of function words in an immediate recall task.

Rodd and Braine (1970) investigated whether children's imitations of alternate forms of grammatical constructions would yield systematic data which could be interpreted as reflecting grammatical competence. They also wished to informally compare the results of the imitation method with some observations of spontaneous productions. At the conclusion of the investigation it was felt that children's imitations of adult speech were not simply accurate repetitions based on what their memory span would allow. They felt rather, that children's spontaneous imitations were an active process which required assimilation and reorganization of the adult utterance before they could reproduce it in accord with their current level of grammatical competence.

Additional informal observations as to the conversational nature of children's imitations were made by Rodd and Braine (1970). They concluded that children's spontaneous imitations show very little difference from their spontaneous productions. "Particularly and most importantly, when compared with observations of one child's spontaneous production, the data of the present study leads us to conclude that imitation and production derive from the same linguistic competence, neither being more progressive than the other." It was also suggested that while research over a wider range of constructions is

needed to verify the close relationship between spontaneous imitation and spontaneous production, sentence imitation does appear to be a fruitful way of investigating specific questions regarding linguistic competence.

CARROW LANGUAGE SAMPLING METHOD

Although Carrow (1974) has indicated that sentence imitation could be used as a valuable measurement of linguistic competency in assessing the speech of children, she also felt there was a need for procedures which assembled representative items in a systematic fashion for eliciting imitations. In an effort to bypass the problems found in speech sampling procedures and in an attempt to provide an efficient yet reliable method of obtaining performance data on a child's grammatical system, the Carrow Elicited Language Inventory was developed.

In a test comparing the CELI and Lee's DSS method, it was found that both procedures successfully separated language groups. Carrow (1974, p. 441) further indicated that the CELI gave information similar to what is obtained when a free speech sampling method is used.

> Since the test provides a high ceiling for performance and includes an inventory of structures of various levels of complexity it can evaluate the breadth of the child's capacity somewhat better than can a language sample that relies on what a child does rather than what he can and cannot do.

While Carrow (1974) believes no single procedure can provide all the information needed about a child's grammar, she does feel that constraints of time and clinical background will influence which procedures will be used. She stated that, "the unambiguous scoring of the imitation test and the few instances when decision making is required make it a useful tool for clinicians who do not have extensive backgrounds in psycholinguistics."

CHAPTER III

RESEARCH DESIGN AND PROCEDURES

The design for this investigation was a two-part, single group correlational study in which a short form of the Carrow Elicited Language Inventory was developed for use with first-grade children. The items selected for the short form were items that appeared to best discriminate the performance of normal children from those who were language delayed. Each subject's score on the short form was compared with his score on the long form to determine if there was a high degree of correlation between the scores.

Whereas the long form of the CELI samples more than one category in each sentence presented, categories in the shortened form may not have been sampled in the same proportion as in the long form. As no test using sample items can predict every category with complete accuracy, this investigation attempted to predict overall expressive language performance only.

POPULATION AND SAMPLE

A group of 56 first grade-children, ages 5 years 9 months to 6 years 9 months served as subjects. All children meeting the age requirements were chosen from regular classrooms subject to availability

and time factors. The total number of children meeting the age requirement was approximately 75.

The school chosen for this investigation was of a predominantly white, middle-class background with a very small percentage of students being of Mexican-American descent. The Aid to Families with Dependent Children (AFDC) count for the 1977 school year was 59 out of an enrollment of 676 students.

MATERIALS AND SOURCES

The Carrow Elicited Language Inventory is constructed of 51 sentences and one phrase, with a length range of 2 to 10 words and an average of six words. The child's responses were tape-recorded and later transferred to a matrix sheet upon which the grammatical forms were classified. Although some productions seemed to be appropriate for a particular age level, they were scored as inadequate if they deviated from the adult stimulus productions.

Analysis included a total error score as well as subscores for each category and type. A protocol, which organized the forms by grammatical contexts, was provided for use in analyzing the specific problems after the general area of difficulty was determined.

A revised version of the CELI was administered to 475 white children between the ages of 3 years 0 months and 7 years 11 months

who spoke Standard American English in their homes and were from a middle socioeconomic level. It was found that "differences in total error scores between the age groups were significant, indicating that the test reflects the change in grammaticality in children as age increases" (Carrow, 1974). It was also found that internal and external validity were high with significant positive correlations between the total error score and each category and subscore.

METHODOLOGY

The Carrow Elicited Language Inventory was administered to a group of 56 first-grade children. A short form of the CELI was then developed by identifying those items which had the best discriminative power between the high scores and the low scores on the test. The subjects' scores were arranged in order from highest to lowest. Using procedures outlined by Garrett (1966, p. 366), a PDP-11 BASIC computer program was used to select those subjects whose scores were in the top 27% and those in the bottom 27% for comparison. The degree of difficulty and the validity index were determined from a table provided by Garrett for each of the items on the test.

From these indexes, 8 items were selected for inclusion in the short form. The items selected had a suitable range of difficulty for predictive purposes and maximum discriminative power. Once items for

the short form were selected, the score for each of the 56 subjects on the short form was compared with the score on the complete CELI as determined by the scoring procedures outlined in the manual for the CELI.

A second scoring procedure which simply placed items in a right or wrong category was also used for comparative purposes between items on the long form and those on the short form for each student. A Pearson Product Moment Correlation was then used to determine the relationship between the scores from the long form and those of the short form according to each scoring method for all subjects.

CHAPTER IV

RESULTS

Fifty-six middle socioeconomic status children between the ages of 5 years 9 months and 6 years 9 months were administered the Carrow Elicited Language Inventory. The tests were all scored by the examiner. The children's raw scores are listed in Appendix A. To ensure valid scoring, nine tests were randomly selected for rescoring by a Speech-language Pathologist proficient at administering the CELI. A reliability factor of .97 was found to exist between the two sets of test scores. A shortened form of the test was then devised for screening purposes with first-grade children.

Scores on the short form were compared with scores on the long form through use of a Pearson Product Moment Correlation. It was found that a high positive correlation existed between the long form and the shortened form of the CELI.

ANALYSIS OF DATA

Item Analysis

An Item Analysis was used to determine the sentences on the long form which had the best discriminative power. This was accomplished by comparing the responses of the upper one-third of the subjects

with the responses of the lower one-third of the subjects. The eight items chosen as listed in Table 1 had a discrimination of .57 or above. According to Garrett (1966, p. 368), items are generally considered satisfactory if they have a "validity index" of .20 or more. Appendix B gives the item analysis data for the entire test.

Pearson Product Moment Correlation

The short form was compared with the long form of the Carrow Elicited Language Inventory using the scoring method described in the manual. This resulted in a high positive correlation between the two scores (r = .869). This suggests that the short form identifies approximately 76% of the individual differences as measured by the long form, when using the traditional scoring method on both the long and short form.

Comparison of the short form with the long form using a plus or minus method of scoring also had a high positive correlation (r = .771). However, the coefficient of determination (.594) suggests that only about 60% of the individual differences, as identified by the long form, are being identified with the short form when this method of scoring is used.

TABLE 1

DIFFICULTY AND DISCRIMINATION FOR ITEMS ON SHORT FORM

	Sentences	Difficulty	Discrimination
5.	Have you been gone?	88	62
11.	The big green ball is mine.	80	70
12.	The girl is not happy where she lives.	73	57
14.	Bill isn't coming to school.	84	62
19.	They do not want to go.	84	58
23.	The man likes painting by himself.	25	66
40.	Do the boys like their bike?	32	59
52.	If it rains, we won't go to the beach.	73	70

Standard Error of Estimate

The standard error of estimate for the short form using the plus or minus method is 1.11, which indicates that predictions will be in error no more than 1.11 score points in two-thirds of the predictions made. With the short form which uses the traditional scoring procedure, the degree of error is 1.4 in two predictions out of three.

CHAPTER V

DISCUSSION

Free Speech Sampling procedures have long been considered a valuable means of determining a child's level of grammatical useage. This method, however, has been found to be time consuming and lacking in standardization of procedures. As a result, test-retest reliability of any two or more samples is greatly reduced. The Carrow Elicited Language Inventory was developed to provide a valid yet standardized method of gaining grammatical information. However, this method can also be a very time consuming procedure.

This investigation was designed to develop a shortened form of the CELI to be used for screening purposes with first graders. Screening tests are generally provided to enable the user to quickly sample a child's performance on a particular task. Devices of this sort are particularly important in the school setting where there are large numbers of children which must be screened for possible speech and language difficulties in as short a period of time as possible.

Before this particular research was initiated it was not known if it would be feasible to develop a short form of the CELI. With this consideration in mind, it was decided to attempt to develop a screening form for only one grade level. There are no standard grade levels set

for screening procedures; however, many schools conduct screenings at the first grade level. Because of this, it was felt that a screening form for first graders would be useful.

Fifty-six children between the ages of 5 years 9 months and 6 years 9 months were evaluated with the CELI. Tests were scored according to the instructions in the manual. This method takes into consideration the number of items missed per sentence and places them in specific categories of error.

An Item Analysis was used to determine which sentences had the best discriminative power. This is determined by the extent to which a given item discriminates among examinees who differ sharply in the areas measured by the test as a whole (Garrett, 1966, p. 365). Eight sentences were then selected for the short form. These sentences had a suitable range of difficulty for predictive purposes and maximum discriminative power. They were as follows:

5. Have you been gone?

11. The big green ball is mine.

12. The girl is not happy where she lives.

14. Bill isn't coming to school.

19. They do not want to go.

23. The man likes painting by himself.

40. Do the boys like their bike?

52. If it rains, we won't go to the beach.

Upon completion of selection of items for the short form, each child's score on the long form was compared with his score on the short form using the procedure outlined in the CELI manual. In addition, a plus or minus procedure was also used which simply placed items in a right or wrong category without taking into consideration the number of items missed per sentence. A sentence was scored as incorrect if any part of the sentence was missed.

The results indicated a strong correlation between the long and short forms when scored according to the instructions in the manual for the CELI. A strong but somewhat lower correlation also existed for the right or wrong method of scoring.

The average time required to administer, transcribe and score the CELI is approximately 45 minutes. Although the information gained is valuable, there are many times when a quick sampling of a child's language is all that is desired. It is at times such as this that a screening form can be useful.

While the short form which is patterned after the CELI would greatly reduce the time factor involved in sampling a child's expressive language, it still contains certain limitations. Therefore the plus or minus method of comparison was used to determine if an accurate means of predicting difficulties could be determined on a right or wrong basis.

In the present investigation a tape recorder was used during the testing situation. The use of a tape recorder for a screening test would be undesirable as most clinicians would not wish to go back and transcribe every child's test. Clinicians are also more likely to make scoring mistakes when every item on the test must be scored than when making an overall judgment as to whether the sentence as a whole is right or wrong.

The short form, based on the plus or minus scoring procedure, would reduce the administration and scoring time to less than 5 minutes per child. It would also eliminate the need for a tape recorder and the time involved in transcribing the sentences as only presence or absence of error would be noted for each sentence.

The estimate of error for either method of scoring the short form is slightly over 1 point. Therefore, it appears that the plus or minus method of scoring would provide the type of information which is desired while at the same time it would considerably reduce the time and inconvenience factors involved with the traditional method of scoring.

Children falling within the tenth percentile are generally considered to have difficulty with expressive language capabilities. It was decided to use a percentile rank of 10 for the cut-off point on the short form using the plus or minus method of scoring also. Therefore,

a child who missed 5 or more sentences on this short form would not pass the screening. As it was felt that the short form using the plus or minus method of scoring was more efficient, no cut-off scores were set for the short form using the scoring procedure patterned after the CELI.

Eight of the fifty-six subjects were identified as needing additional diagnostic testing when using a cut off score of 5 or more on the plus or minus method of scoring the short form. Of these 8 subjects there was one subject whose score on the long form would not have indicated any difficulties with expressive language. In addition, there were 3 subjects whose scores on the long form indicated a need for diagnostic testing that were not identified by the screening form.

CHAPTER VI

SUMMARY AND CONCLUSIONS

From the results gained in this study, it is indicated that a shortened form of the Carrow Elicited Language Inventory could be developed for use with all ages represented on the CELI. One method of approach might be to make use of the same short form that was developed for the first-grade level and use different cut-off points for other age groups. Additional research with the short and long forms conducted on a separate sample is recommended to verify the validity of the first sample.

It is also felt that the scoring system of the short form might be improved by requiring the examiner to look for the presence or absence of specified key words in each sentence. This system would make use of a wider scoring range which may result in an even more accurate screening procedure than the one developed in this investigation.

The use of the short form with a cut-off score of 5 or more on the plus or minus method is recommended for use as a screening device only. The long form of the CELI should be used when more complete diagnostic information is required.

APPENDIX A

Number of Items Missed Per Child

For Each Scoring Procedure

APPENDIX A

NUMBER OF ITEMS MISSED PER CHILD FOR EACH SCORING PROCEDURE

Subjects	Long Form	Short Form + or - Method	Short Form Regular Scoring
1	5	2	2
2	5	1	1
3	8	0	0
4	8	1	1
5	8	1	1
6	9	1	1
7	10	1	1
8	10	0	0
9	10	2	2
10	11	2	2
11	11	1	1
12	11	2	2
13	11	1	1
14	12	1	1
15	12	2	2
16	13	0	0
17	13	2	2
18	14	1	1
19	14	1	1
20	14	0	0
21	14	0	0
22	15	3	3
23	15	4	4
24	15	3	3
25	16	4	5
26	17	3	4
27	17	2	2
28	17	2	2
29	18	2	2
30	18	1	1
31	19	1	1
32	19	4	6
33	19	3	3
34	20	3	5
35	20	4	4
36	21	2	3
37	21	3	3
38	21	3	4

Subjects	Long Form	Short Form + or - Method	Short Form Regular Scoring
39	21	3	4
40	22	2	4
41	23	4	4
42	23	3	4
43	23	6	7
44	24	3	3
45	24	2	5
46	25	2	2
47	27	4	5
48	28	6	7
49	28	6	8
50	30	3	4
51	34	3	4
52	43	6	11
53	44	5	10
54	44	6	10
55	55	6	10
56	55	6	10

APPENDIX B

Difficulty and Discrimination for Items on the Long Form

APPENDIX B

DIFFICULTY AND DISCRIMINATION FOR ITEMS ON THE LONG FORM

Sentences	Difficulty	Discrimination
11. The big green ball is mine.	80	70
52. If it rains, we won't go to the beach.	73	70
23. The man likes painting by himself.	25	66
5. Have you been gone?	88	62
14. Bill isn't coming to school.	84	62
40. Do the boys like their bike?	32	59
19. They do not want to go.	84	58
12. The girl is not happy where she lives.	73	57
33. Mother gave the ball to her.	71	54
20. The boy is jumping because it's fun.	68	54
35. Those toys may have been mine.	45	54
36. The next house is the last.	77	53
42. Didn't the man see the book?	75	53
25. The lady will sit down.	89	51
39. Why is the doll broken?	89	51
16. The children don't play do they?	61	50
22. Couldn't Daddy have been coming?	57	49
3. The boy runs or plays.	46	48
30. The tree is between the houses.	59	47

Sentences	Difficulty	Discrimination
51. Mother told me to play in the house.	95	45
13. I am not going to play.	93	45
15. That's not a baby, is it?	93	45
7. Tell everyone what I want to do.	63	45
24. She has been running.	88	44
21. Bill knew how to fix it.	84	44
46. The train is bumped by the car.	41	41
26. Mother had seen the paper.	29	39
8. The train bumps the car.	73	38
9. No one has a ball.	73	38
6. They did run fast.	95	37
34. Whose puppy is black and white?	95	37
43. Doesn't Lassie play with you?	95	37
2. Cats jump.	93	37
31. The dog is under the house.	86	36
28. The dog is up in the tree.	82	36
27. She would have liked to go.	14	36
45. The boy is chased by the dog.	80	33
4. Cats want to be chased.	52	33
48. Bring me the car that is on the chair.	46	33
18. He doesn't like whatever we've written.	32	33

Sentences	Difficulty	Discrimination
44. Why didn't she stand up?	89	28
32. They are playing games.	88	28
29. He puts the paper down.	84	27
50. Daddy asked me to read my book.	84	27
17. The girl can't go outside.	79	24
47. She showed the girl the boy.	48	27
49. The car stopped before I could call.	36	22
38. Where are the dolls?	84	19
41. Will he jump on the car?	73	8
1. Big girl.	100	00
37. You run to the store now.	96	00
10. Both balls are bigger than hers.	86	00

REFERENCES

Carrow, E., "A Test Using Elicited Imitations in Assessing Grammatical Structure in Children." J. Speech Hearing Dis., 39, 437-444 (1974).

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

Engler, L. F., E. P. Hannah, and T. M. Longhurst, "Linguistic Analysis of Speech Samples: A Practical Guide for Clinicians." J. Speech Hearing Dis., 38, 192-203 (1973).

Freedle, R.O., T. J. Keeney and N. D. Smith, "Effects of Mean Depth of Grammaticality on Children's Imitations of Sentences." J. Verb. Learn. Verb. Behav., 9, 149-154 (1970).

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

Johnson, M. R., and J. B. Tomblin, "The Reliability of Developmental Sentence Scoring as a Function of Sample Size." J. Speech Hearing Res., 18, 372-380 (1975).

Lee, L., Developmental Sentence Analysis. Evanston: Northwestern University Press, 1974.

Lee, L. L. and S. M. Canter, "Developmental Sentence Scoring: A Clinical Procedure for Estimating Syntactic Development in Children's Spontaneous Speech." J. Speech Hearing Dis., 36, 315-337, (1971).

Luterman, L., and A. Bar, "The Diagnostic Significance of Sentence Repetition for Language Impaired Children." J. Speech Hearing Dis., 36, 29-39 (1971).

McNeill, D., "Developmental Psycholinguistics", in F. Smith and G. Miller eds., The Genesis of Language: A Psycholinguistic Approach. Cambridge: MIT Press, 1968.

McNeill, D., The Acquisition of Language: The Study of Developmental Psycholinguistics. New York: Harper and Row, 1970.

Menyuk, P., "A Preliminary Evaluation of Grammatical Capacity in Children." J. Verb. Learn. Verb. Behav., 2, 429-437, (1963).

Menyuk, P., "Comparison of Grammar of Children with Functionally Deviant and Normal Speech." J. Speech Hearing Dis., 7, 109-121, (1964).

Rodd, L. J., and M. Braine, "Children's Imitations of Syntactic Constructions as a Measure of Linguistic Competence." J. Verb. Behav., 10, 430-443, (1970).

Scholes, R. J., "The Role of Grammaticality in the Imitation of Word Strings by Children and Adults." J. Verb. Learn. Verb. Behav., 8, 225-228, (1969).

Sharf, D. J., "Some Relationships Between Measures of Early Language Development." J. Speech Hearing Dis., 37, 64-74, (1972).