

A COMPARISON OF DEVELOPMENTAL SENTENCE SCORES
FROM HEAD-START CHILDREN COLLECTED IN FOUR CONDITIONS

by

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B. S., Kansas State University, 1974

A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

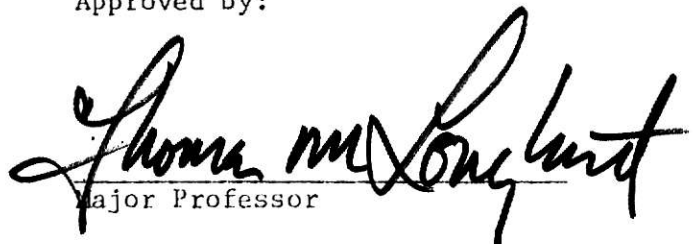
MASTER OF ARTS

Department of Speech

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1975

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**THIS BOOK
CONTAINS
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ACKNOWLEDGEMENTS

I wish to express my sincere appreciation to Dr. Thomas M. Longhurst whose guidance, suggestions, and constant support have contributed so much in developing this thesis.

I wish also to express my thanks to the members of my committee: Dr. Bruce Flanagan, Dr. James Armagost, and Dr. Norma D. Bunton.

Thanks also go to Ann Butler and Marge Coco, teachers at the Manhattan Head Start School, and Jan Firling at Kansas State University, for their assistance in selecting the subjects and cooperation during the period that data was being collected.

My appreciation also goes to Barry Molineux for his cooperation and support this past semester. In addition I wish to express many thanks to Bob Glace, Ben Bauman and Diane Wasinger for the many hours they contributed to assisting with the data analysis, and to Andrena Vedros for her contribution of computing the reliability.

For statistical advise, I am grateful for the assistance of Dr. Arthur Dayton of the Kansas State University Statistics Department. I am also thankful to Carolyn Wilson for the typing.

INTRODUCTION

Many speech pathologists and other professionals have evaluated the development of language in children. Language assessment has typically been completed by administration of standardized tests and comparison of the results with normative data. Such assessment tools are readily available, easily administered, and quick to ascertain a deviance when compared to normative data. However, when emphasis is placed on such structured test formats, the child's typical linguistic performance is often excluded by such factors as inappropriate stimuli and unnaturally structured tests situations. Consequently, a more representative sample of oral language would serve as a more adequate measurement of how the child functions and how well he can function.

The elicitation of oral language to obtain a representative sample of one's typical linguistic performance has become increasingly popular within recent years (Longhurst, 1974). Assessment of oral language samples has often been computed by one of the following linguistic measures: type-token ratio, a feature of vocabulary quality and diversity; mean length of response; and the length complexity index (Miner, 1969), a qualitative measure of sentence length and complexity. Of increasing popularity is the Developmental Sentence Scoring procedure (Lee and Canter, 1971; Lee, 1974) which assesses the syntactical development of the subject's verbal output. One major problem, however, with using this method of assessing speech and language

is that there is no standard method presently employed for eliciting the language sample from the child.

Various methods have been utilized to elicit oral language samples from handicapped children. Elicitation procedures have included free play, toys, pictures, child/child and child/adult conversations, and engagement in various other activities. Menyuk (1964) obtained language samples from three different situations--child/adult, child/child, and the child's response to a variety of other circumstances. Wilson (1969) used the Picture Story Language Test (Mykelbust, 1965) to obtain a language sample from forty normal subjects ages three to seventeen. Wilson recommended this as a standardized procedure although Griffith (1969) criticized this procedure. Labov (1970) criticized all methods of elicitation which included questions and answers between the adult and child, regardless of stimulus materials being utilized. He recommended that a group of children be left alone with a guinea pig and instructed to talk to it so it wouldn't get lonely. He found that under these conditions the children's language was much richer in content, ideas, and syntactic structure than when adults were included in the conversation. In another study, (Engler, Hannah, and Longhurst, 1973) it was recommended that the clinician use "optimum stimulus materials" and avoid excessive participation by merely asking the child what he sees or what is happening and then allowing the child to talk freely.

Several recent investigations have studied effects of elicitation procedures upon the linguistic complexity of the samples as measured by type-token ratio, mean length of response, and length-complexity index. Cowan, Weber, Hoddinott, and Klein (1967) studied variations in mean length of response as a function of the stimulus conditions.

They found significant differences in mean length or response scores among ten pictures taken from a popular magazine's cover paintings. Mintun (1968) elicited language samples from thirty educable mentally retarded children by three stimulus conditions; toys, color photographs of the same toys, and twenty-second color films of the actual items represented by the toys. No significant differences were found among mean length of response scores, however, the length complexity index scores of the samples elicited by the films were significantly higher than the photographs. Stranberg (1969) elicited language samples using the same procedures as Mintun and found no measurable differences in length complexity index or mean length of response scores for language samples elicited using these three stimulus media. Ahmed (1973) elicited language samples from thirty-two mentally retarded residents of a state institution by using single-object and multi-object pictures taken from the Peabody Language Development Kit (Dunn & Smith, 1966). She found that multi-object pictures elicited significantly higher length complexity index, Carroll type-token ratio, and total number of word scores. No significant differences were found in the mean length of response scores. Longhurst and Grubb (1974) found real differences between language samples collected in four situations, object elicitation, picture elicitation, adult-child conversation, and peer conversation. They applied four linguistic measures and found that type-token ratio and total number of word scores were more influenced by elicitation procedures than length complexity index and mean length of utterance. Their results indicated that less structured, conversational settings elicited language of greater quantity and complexity than more structured task-oriented settings. Contrary to findings of Mintun (1968) and

Ahmed (1973), scores on the length complexity index varied least between treatments. The results of these investigations demonstrated that stimulus variations do produce measureable differences when relatively traditional measures are used on samples of retarded children.

One study (Cowan et al., 1967) found variations in language samples using mean length of response as the measure. Mintun (1968) and Ahmed (1973) found length complexity index to be a sensitive measure of real differences between language samples. Longhurst and Grubb (1974) found type-token ratio and mean length of utterance especially sensitive to structured (picture and object) elicitation procedures.

Currently, no systematic investigations have been conducted on the effects of elicitation procedures upon the Developmental Sentence Score analysis. Lee (1974, p. 59) states, "Stimulus materials will vary from child to child depending upon interests, intellectual level, and the severity of his handicap." She used toys, pictures, and the child's recitation of the "The Three Bears" story to elicit language samples from a group of two hundred normal children. She found that six-year olds tend to respond by speaking more about the pictures and story than about the toys. In regard to the stimuli she used, further specification of the pictures, as well as the toys would be necessary for replication. In addition, the story stimulus condition is not a representative sample of the child's language but of his ability to remember or memorize a specific response.

The purpose of the present study was to analyze the effects of various elicitation procedures upon Developmental Sentence Scores and percentiles. A comparison was made among Developmental Sentence Scores elicited from the same children using four procedures; multi-object picture, toy, single-object picture, and conversation.

It was hoped that the information derived from this study would contribute to a more standardized method of eliciting oral language samples for developmental analysis.

METHOD

Subjects

The subjects included twenty students, thirteen females and seven males in the Manhattan, Kansas Head Start Program. All subjects were from lower-economic status families as determined by the family head's income. The chronological ages of the subjects ranged from 3-11 to 5-0 years of age with a mean of 4.7 years. The Peabody Picture Vocabulary Test (Dunn, 1959) was administered to each subject and the intelligence quotient scores ranged between 71 and 108 with a mean of 94.82. See Appendix A for individual subject scores. All subjects were administered a hearing screening and were able to respond at 500, 1K, 2K, and 4K at 35 dB ISO.

Prior to the experiment, a list of the twenty most intelligible of thirty children currently enrolled in the Head Start program was obtained from the teacher. The experimenter observed in the classroom and met briefly with each child to determine if the intelligibility of their speech and language were sufficient for participation in the study.

Setting and Materials

The experiment was conducted in a small, quiet room containing a tape recorder, a microphone, a table, two chairs, and all stimulus materials. The tape recorder was placed under the table and only the microphone was visible to the subject. All stimulus materials were placed under the table and were made visible to the subject only during

the condition in which the materials were involved. The experimenter and subject were seated facing the small table for two conditions, faced each other for one condition, and were seated on the floor during a fourth condition. These various physical arrangements were necessary to facilitate elicitation in each condition.

The experimental materials were placed on the table during the two conditions that the subject and experimenter faced the table. The materials used during these conditions included ten "I Wonder" pictures and twenty-three Level #1 and Level #2 single object cards from the Peabody Language Development Kit (Dunn and Smith, 1966). The conditions utilizing these pictures were Condition A, Multi-object Picture, and Condition C, Single-object Picture. The experimental materials used during Condition B, while the experimenter and subject were seated on the floor were four three-dimensional toys. These included the Play Family Action Garage, Play Family Fun Jet, and Play Family Airport made by Fischer-Price, and the Push Button Farm made by Child Guidance. All stimulus materials were chosen by their attractiveness to the children at the subject's developmental level.

Procedures

The subjects were divided randomly into four equal groups. Each of the four groups responded to each of the four experimental conditions in a counterbalanced order. Thus there were five 4 x 4 condition x order latin squares (Winer, 1962, p. 517).

In Condition A (Multi-object Picture), the child and the experimenter were both seated at the table. The following instructions were given, "Now we are going to look at some pictures. I want you to tell me everything you can about the picture. Tell me what is happening in

this picture." The experimenter assisted the child in description of the first picture. The subject was then shown ten pictures, one at a time. See Appendix B for a more complete description of the pictures. The examiner encouraged responses if the child was not responding well by saying, "Tell me more about the picture." Verbal reinforcement including, "You are doing fine," and "That was good," were given on a non-contingent schedule. However, the experimenter was careful to give no specific labels about the stimuli.

In Condition B (Toy), the child and examiner were seated on the floor in the experimental room. The following instructions were given, "Now we are going to look at different toys and you are going to talk about them. Tell me all you can about this." Three gerbils were used as demonstration stimuli for this condition. The examiner elicited such responses as name, color, size, what used for, description and composition of the demonstration stimulus as a model for telling about the toys (barn, airport, parking lot, and airplane) taken from under the table. Prompts included, "Tell me more about it," and "That was very good."

In Condition C (Single-object Picture), the experimenter and the child were seated at a table in the experimental room. Each of the subjects were given the following information, "Now we are going to look at some pictures. Tell me about this picture." The experimenter described the first picture as a model to be used by the subjects. The experimenter then presented twenty-three single-object pictures from the Peabody Language Kit (Level 1 and 2). See Appendix for a more complete description of the pictures. Prompts used to encourage more responding included, "Tell me more about the picture," and "That was good."

In Condition D (Conversation), the experimenter and subject were seated in the experimental room facing each other with no stimulus materials present. The experimenter gave the following instructions, "Now we are going to just talk to each other. I am going to ask you some questions and you tell me everything you can." The experimenter described a trip to a farm as a demonstration. The experimenter then elicited conversation by a variety of topics including family, school, television, and familiar activities. See Appendix for the topics of discussion.

All speech elicited, spontaneous as well as in response to the examiner's questions, was considered a part of the language sample. The length of each condition was not constant but was dependent upon the amount of time necessary to obtain approximately fifty grammatical sentences from each subject under each of four stimulus conditions. In addition, each subject was presented all stimuli in the same sequence.

Protocol Preparation and Segmentation

After all sessions were completed, typewritten, verbatim transcripts were prepared from the tape recordings. The experimenter used instructions by Lee (1974) for recording the conversation, transcribing the tape, selecting the corpus for grammatical analysis and separating the sentences. The Developmental Sentence Scoring procedure which assesses the syntactical development of language was applied to fifty sentences within each of four conditions for each subject. The Developmental Sentences Score procedure gave weighted scores to the developmental order of pronouns, verbs, negatives, conjunctions, yes-no questions, wh-questions, and the grammaticality of the sentence. The total number of points accumulated on all the sentences was divided by the number of

sentences to produce the Developmental Sentence Score. A percentile score for each subject was computed using Lee's normative figures.

Reliability

As a measure of inter-examiner reliability, one protocol was chosen at random from each of four experimental conditions. A graduate student in Speech Pathology at Kansas State University re-typed, re-segmented, and re-scored all linguistic analyses on these four protocols. Inter-judge reliability is an independent observer's evaluation of responses compared with the experimenter's evaluation. Inter-judge reliability was calculated by the following formula:

$$\text{Reliability} = \frac{\text{agreements}}{\text{agreements} + \text{disagreements}} \times 100$$

Statistical Analysis

The Developmental Sentence Scores and percentiles were subjected to an analysis of variance procedure (Winer, 1962) with Subjects, Order of condition, and Condition as main effects. When a relevant significant main effect resulted, a Least Significant Difference (LSD) procedure (Fryer, 1966, p. 260) was applied to evaluate the pattern of differences.

RESULTS

Results of inter-examiner reliability on the four language samples indicated percentage of agreement between 91 and 93, 90 and 96, 94 and 97, and, 83 and 100 for typing, segmentation, and computation of Developmental Sentence Scores and percentiles respectively.

A total of eighty language samples were collected, each of the twenty subjects having responded in four elicitation conditions. The

latin square design of this experiment and analysis of variance made it possible to analyze differences in Subjects, Order of Condition presentation, and Condition. Developmental Sentence Scores and percentiles are presented in Appendix E. These sets of scores were each subjected to an analysis of variance. The two analysis of variance tables are presented in Appendices F and G. The results for Developmental Sentence Scores indicated significant differences between the Subjects ($F=1.87$, $df=19$, $p=.0373$), although this was not of particular interest in this study. Order was not a significant main effect. However, the Condition main effect was significant, ($F=8.10$, $df=3$, $p=.0002$). The same pattern of significant differences was found for Subjects ($F=1.78$, $df=19$, $p=.0501$) and Conditions ($F=8.06$, $df=3$, $p=.0002$) for the Developmental Sentence Score percentiles. Order of condition again was not a significant main effect.

The mean Developmental Sentence Scores and percentiles are presented in Table 1. Application of the Least Significant Difference procedure to the Condition main effects for the Developmental Sentence Scores indicated that Condition D, Conversation, was significantly different from Conditions A, B, and C at the .05 level but there were no significant differences among Conditions A, B, and C. Application of the Least Significant Difference procedure to condition main effects for the Developmental Sentence percentile scores indicated that Condition D, Conversation, was significantly different from Condition B, Toy, and Condition B was significantly different from Conditions A and C at the .05 level. There was no significant difference between Conditions A and C.

TABLE 1

Mean Developmental Sentence Scores and Percentiles
in the Four Conditions

Condition	DSS	DSS Percentile
A--Multi-object Picture	7.03 ^a	29.00 ^a
B--Toy	7.52 ^a	39.40 ^b
C--Single-object Picture	7.02 ^a	30.25 ^a
D--Conversation	8.43 ^b	56.50 ^c
Least Significant Difference (.05)	.66	6.32
Rank of means	D <u>B C</u> A	D B <u>C A</u>

Note--Column means sharing a common superscript are not significantly different at the .05 level.

DISCUSSION

The differences for Developmental Sentence Scores and percentiles among the subjects were found to be significant. These differences, though taken into consideration, were not relevant to the present study. Any effects they might have on the Conditions were limited by selecting subjects from a very controlled population and randomly assigning the subjects to various sequences of Condition presentation.

No significant Order effect was found for Developmental Sentence Scores or percentiles. This finding allows the interpretation that differences in Condition were due to the Conditions rather than the Order in which they were presented.

The main question this experiment was designed to answer was whether language samples collected in four elicitation Conditions were significantly different when Developmental Sentence Scores and percentiles were computed from these samples.

Condition A (Multi-object Picture) and Condition C (Single-object Picture) were highly structured methods of elicitation. This is based on the fact that the subjects were required to respond to specific stimulus materials and that they were given specific instructions prior to their verbalization. Condition B (Toy) was less structured. During Condition B, the experimenter and the child were seated on the floor and the child was allowed to play and talk freely about four toys. Condition D was unstructured because the subject was asked to respond to conversational stimuli and talk freely about anything he wished.

The analysis of variance results revealed that there were significant differences in Developmental Sentence Scores and percentiles among

oral language samples collected in the four Conditions. Each of the Conditions will be discussed individually in terms of the mean scores that the subjects received.

Condition D (Conversation) was highest in the rank of means for the Developmental Sentence Scores and percentiles. This is probably due to the fact that the children were asked basic questions concerning family, school and home to which they all could relate. The other elicitation Conditions had presented particular pictures or toys, which the subjects may not have been familiar with. Possibly this Condition seemed less task-oriented to the child because there was more experimenter-child interaction than merely giving specific instructions such as, "Tell me about this," or "Tell me what is happening," with little further interaction. The experimenter also believed that when the subjects were presented conversational stimuli they responded more quickly and were more attentive to the task than when presented pictures and toys.

Condition B (Toy) elicited samples ranking second in the rank of means for both the Developmental Sentence Scores and the percentiles. This Condition was probably the most unstructured of the four elicitation Conditions due to the relaxed seating position of the experimenter and subject and to the presentation of attractive toys, some of which were in the childrens' educational setting and therefore familiar to them. The experimenter felt the reason that this Condition did not occupy the highest ranking was due to the fact that the subjects became so involved in playing with the toys that their verbalizations decreased. Possibly utilizing toys with fewer parts and functions than those used in the present study would elicit more verbalizations.

Condition A (Multi-object Picture) was third in the rank of means on the Developmental Sentence Scores and lowest on the percentiles. Even though the child was asked, "What is happening in the picture," utterances were short and lacked complexity. The subjects tended to merely point and name items rather than elaborate on what was happening in the picture. Perhaps the subjects did not possess the imagination necessary to expand on these pictures, or they lacked past social experiences necessary for familiarization with the particular situations. The experimenter also felt that picture elicitation presented a situation in which the child felt uneasy even though some time was devoted to gaining rapport. The subjects often said, "I don't know" or "I don't know what is happening," indicating not that they didn't understand the question but that they were afraid of answering incorrectly. Being unfamiliar of the stimuli may be especially characteristic of this particular subject population.

Condition C (Single-object Picture) elicited samples ranked lowest on Developmental Sentence Scores and third on percentile scores. Oral language samples elicited in Condition C followed much the same pattern as those samples elicited in Condition A, with no significant difference found between Conditions A and C on scores or percentiles. The samples lacked complexity, consisting basically of labeling and short phrases such as "That is a clown." This stimulus Condition especially affects the child who has limited experiential history, as may have been the case with this population. For example, a few subjects were totally unresponsive to items such as "wrench" and "flag." Possibly these items were uncommon to their environment. The experimenter felt, however, that this elicitation Condition was not totally unsuccessful

because of its simplicity. The subjects did not seem as confused by single-object pictures as they were by multi-object action pictures.

Probably the best representation of the differences between elicitation Conditions was indicated by the large variation in percentile scores for individual subjects. For example, when the scores for subject #1 were applied to Lee's Norm Chart for Developmental Sentence Scores (1974, p. 167), they fell within the 10th percentile for Condition A and the 90th percentile for Condition D. Lee (1974, p. 171) on the chart, Estimating the Length of Language Delay in Months by Means of the Developmental Sentence Score, would consider the same subject between 20 and 23 months language delayed on one oral language sample and in the 90th percentile or considerably advanced on another. This difference is due to the Conditions in which the samples were elicited.

The results of the present study paralleled the results of Longhurst and Grubb (1974) who also found that less structured conversational settings, child-child and child-adult, elicited language of greater quantity and complexity than more structured, task-oriented settings. Labov (1970) found that children's language was much richer in content, ideas, and syntactic structure when elicited by an unstructured child-child interaction. Contrary to the present study, however, Labov had criticized any methods of elicitation which included questions and answers between the adult and child. The results of these two studies raise the possibility of further research utilizing a child-child conversation to elicit an oral language sample for Developmental Sentence Score analysis.

The data clearly show that oral language samples elicited by unstructured, adult-child conversational settings result in higher Developmental Sentence Scores and percentiles than scores of language samples elicited by structured picture and toy settings. Some professionals might believe that during child-adult conversational situations, the adult is acting as a model and the language sample collected is not representative of the child. The present experimenter believes, however, that in situations in which rapport is gained, the child is more at ease and less surrounded by structured tasks, the more representative the sample will be.

There is a possibility that the results of the present study may not be an accurate indication of how well individual subjects will respond. For example, a shy and reserved child would likely verbalize more on toys and picture than when in direct conversation with an adult. A standardized procedure for elicitation of oral language will be difficult to carry out because of these factors.

Lee (1974, p. 168) recommended that "clinicians should be cautioned not to make arbitrary decisions about enrolling or continuing a child for remedial training on the basis of a single Developmental Sentence Score which falls at or slightly below the 10th percentile." The present experimenter recommends that at least two oral language samples be collected from a child when using unstructured elicitation procedures such as conversation and toys. Hopefully, comparison of the two language samples will provide a more representative sample of the child's oral language.

The results of this study raise the possibility of further research using a child-child conversation to elicit oral language samples for

application of Developmental Sentence Score Analysis. The experimenter also recommends that further research on oral language samples elicited by unstructured conversational and toy conditions be analyzed and compared with other linguistic analysis procedures.

APPENDIX A

Subjects, Ages and Scores on the
Peabody Picture Vocabulary Test

Subjects	Chronological Age	Raw Score	Mental Age	Vocabulary Intelligence Quotient	Percentile Score
1.	4-1	22	2-7	71	3
2.	4-11	8	1-11	-	-
3.	5-0	52	5-6	104	62
4.	4-9	51	5-4	103	56
5.	4-8	44	4-4	97	42
6.	4-6	39	3-9	88	18
7.	4-10		(Not Administered)		
8.	3-11	46	4-7	107	69
9.	4-8	49	5-1	108	74
10.	5-0	45	4-6	91	24
11.	4-10	48	4-11	97	41
12.	4-2	44	4-4	103	59
13.	4-1	43	4-2	102	55
14.	4-2	36	3-7	90	19
15.	4-11	48	4-11	97	41
16.	4-8		(Not Administered)		
17.	4-8	39	3-9	88	18
18.	5-0	45	4-6	91	24
19.	4-0	44	4-4	98	42
20.	4-4	33	3-4	77	7

APPENDIX B

Name, Type and Level of the Multi-object Pictures

Name	Type	Level
1. Street scene--the case of the broken window	Large Story Cards	#1
2. Family scene--the arrival of the new baby	Large Story Cards	#1
3. The runaway market truck	W-"I Wonder" Cards	#2
4. The pet shop	W-"I Wonder" Cards	#2
5. Speedway race	X-Large Story Making Pictures	#3
6. The mysterious footprints on the wall	W-"I Wonder" Cards	#2
7. Accident scene--the injured paper boy	Large Story Cards	#1
8. Naval Battle	X-Large Story Making Pictures	#3
9. The emergency room	W-"I Wonder" Cards	#2
10. The bus scene	W-"I Wonder" Cards	#2
11. The rodeo scene	W-"I Wonder" Cards	#2
12. The morning after the storm	W-"I Wonder" Cards	#2
13. Jungle fire	X-Large Story Making Pictures	

APPENDIX C

Referent, Category and Number, and Level of Single-object Pictures

Referent	Category and Number	Level
1. car	U-8	#1
2. airplane	U-13	#1
3. race car	U-9	#1
4. wrench	M-11	#1
5. hatchet	M-1	#1
6. gorilla	B-48	#1
7. lamb	B-21	#1
8. flag	M-30	#1
9. firetruck	U-17	#1
10. cockroach	A-62	#2
11. wagon	T-11	#1
12. gun	T-10	#1
13. motorcycle	U-29	#1
14. man sawing	A-29	#1
15. duck	B-12	#1
16. rooster	B-20	#1
17. snake	B-39	#1
18. cowboy	P-31	#1
19. clown	A-21	#1
20. umbrella	C-59	#1
21. watch	C-60	#1
22. Indian	P-32	#1
23. frog	B-33	#1

APPENDIX D

Conversational Stimuli used in Condition D

-
- D. Tell me about a trip to a farm.
 1. Tell me about your favorite television show.
 2. Tell me what you do in school.
 3. Tell me how you would make a cake.
 4. Have you ever taken a vacation? Tell me about it/Tell me what you would see on a vacation.
 5. Pretend you are walking through a zoo. Tell me all about it.
 6. Tell me about a trip to a grocery store.
 7. Do you have any pets? Tell me about them/Tell me what kind of pets you would like to have and why.
 8. Tell me about your family.
 9. Tell me about your friends at home and at school.
 10. Explain to me your favorite game or toy.
-

APPENDIX E

Developmental Sentence Scores and Percentiles for
the Twenty Subjects in Four Orders and Four Conditions

Elicitation Sequence	Subject	Condition A	Condition B	Condition C	Condition D	Mean Score
A B C D	1.	5.87 (10)	6.89 (35)	8.94 (80)	9.13 (90)	7.71 (53.75)
	2.	8.90 (60)	7.76 (35)	9.40 (65)	7.54 (30)	8.37 (47.50)
	3.	9.76 (75)	9.66 (70)	9.32 (65)	8.96 (55)	9.42 (66.25)
	4.	6.52 (17)	6.56 (18)	5.64 (00)	10.28 (85)	7.25 (30.00)
	5.	6.72 (25)	6.30 (20)	6.32 (21)	9.10 (70)	7.11 (34.00)
B C D A	6.	4.80 (01)	7.32 (35)	6.08 (11)	8.12 (55)	6.58 (25.50)
	7.	7.14 (25)	6.82 (20)	6.84 (20)	11.64 (99)	8.11 (41.00)
	8.	6.80 (35)	7.00 (45)	6.44 (25)	6.78 (35)	6.75 (35.00)
	9.	8.40 (55)	8.26 (50)	6.60 (17)	7.14 (25)	7.60 (36.75)
	10.	6.72 (15)	7.30 (22)	7.02 (20)	7.74 (30)	7.19 (21.75)
C D A B	11.	6.89 (20)	8.52 (50)	7.96 (35)	7.86 (30)	7.81 (33.75)
	12.	7.34 (45)	8.80 (80)	7.50 (50)	8.76 (78)	8.10 (63.25)
	13.	6.32 (20)	6.60 (30)	5.76 (10)	8.04 (70)	6.68 (32.50)
	14.	5.98 (10)	6.92 (35)	6.12 (20)	7.31 (45)	6.58 (27.50)
	15.	6.92 (17)	8.80 (55)	5.46 (00)	9.06 (60)	7.56 (33.00)
D A B C	16.	7.64 (35)	8.64 (60)	5.36 (00)	9.86 (80)	7.87 (43.75)
	17.	7.50 (35)	7.64 (40)	7.54 (36)	7.42 (30)	7.52 (35.25)
	18.	6.40 (10)	7.12 (20)	6.68 (15)	7.59 (28)	6.95 (18.25)
	19.	6.98 (35)	5.44 (08)	7.14 (45)	7.78 (60)	6.86 (37.00)
	20.	7.06 (35)	8.12 (60)	8.32 (70)	8.54 (75)	8.01 (60.00)

APPENDIX F

Analysis of Variance of
Developmental Sentence Scores

Source	df	MS	F	Probability
Subject	19	2.04	1.87	0.0373*
Order	3	0.47	0.43	0.7347
Condition	3	8.84	8.10	0.0002**
Error	54	1.09		
Total	79			

*p < .05

**p < .01

APPENDIX G

Analysis of Variance of
Developmental Sentence Score Percentiles

Source	df	MS	F	Probability
Subject	19	711.71	1.78	0.0501*
Order	3	270.45	0.68	0.5699
Condition	3	3218.60	8.06	0.0002**
Error	54	399.44		
Total	79			

*p<.05

**p<.01

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A COMPARISON OF DEVELOPMENTAL SENTENCE SCORES
FROM HEAD START CHILDREN COLLECTED IN FOUR CONDITIONS

by

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B. S., Kansas State University, 1974

AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF ARTS

Department of Speech

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1975

ABSTRACT

A comparison was made among Lee's (1974) Developmental Sentence Scores and percentile scores computed from oral language samples elicited from twenty children in four conditions; single-object picture, toy, multi-object picture, and adult-child conversation. Each subject responded to the four elicitation conditions in a counter-balanced order. The experimenter typed verbatim protocols, segmented them, and computed Developmental Sentence Scores and percentiles on all eighty language samples. These scores and percentiles were then subjected to analysis of variance with Subject, Order of Condition, and Condition as main effects. Although subject differences were significant they were irrelevant to the purpose of this study. Order differences were nonsignificant. There were significant differences among the four conditions for Developmental Sentence Scores and percentiles. These differences were subjected to a least significant difference procedure. Developmental Sentence Score results indicated that the conversation condition produced significantly higher scores than the other three conditions which were not significantly different from each other. Developmental Sentence Score percentile score results indicated that the conversation condition produced significantly higher scores than the toy condition which produced significantly higher scores than the two picture conditions which were not significantly different.

It was concluded that less-structured elicitation conditions produce the highest Developmental Sentence Scores and percentiles.