DOCUMENT RESUME

ED 025 314 PS 001 416

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California Univ., Los Angeles.
Spons Agency- Office of Economic Opportunity, Washington, D.C.
Report No- OEO-4139
Pub Date Aug 68
Note- 14p.; Paper presented at the annual meeting of the American Psychological Association, San Francisco, Calif., August, 1968.
EDRS Price MF-$0.25 HC-$0.80
Descriptors- Audiolingual Methods, *Comparative Analysis, *Culturally Disadvantaged, Echolalia, *Language Instruction, Language Skills, *Preschool Children, Story Reading, *Teaching Methods, Verbal Ability, Verbal Development, Verbal Tests, Visual Stimuli

In an attempt to explore a systematic approach to language expansion and improved sentence structure, echoic and modeling procedures for language instruction were compared. Four hypotheses were formulated: (1) children who use modeling procedures will produce better structured sentences than children who use echoic prompting, (2) both echoic and modeling procedures will be more effective in verbal behavior than listening to stories and remaining silent, (3) all three procedure will be more effective than those of the control group, who receive no special instruction, and (4) girls will be superior to boys in parallel sentence production. Forty-eight Head Start children, divided into four groups, were randomly assigned to one of the following treatments: echoic prompting (children listened to and echoed each sentence in every lesson); parallel prompting (children listened to a sentence for the first picture and, using this as a model, produced the sentence for the second picture); listening only (no overt response); and control (pretests and posttests with no special instruction). The results supported only the first hypothesis significantly. Evidence shows, however, that children who listen to, echo or model well formed sentences have a facility to produce appropriate sentences when compared to children who are not so exposed. (JS)

COMPARATIVE EFFECTIVENESS OF ECHOIC AND MODELING PROCEDURES IN LANGUAGE INSTRUCTION WITH CULTURALLY DISADVANTAGED CHILDREN[1]

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[1]Paper presented at the Annual Meeting of the American Psychological Association, San Francisco, August 1968. The work reported herein was carried out with the support of the U.S. Office of Economic Opportunity, Contract No. 4139.

Abstract

The comparative effectiveness of echoic and modeling procedures for language instruction was investigated with 48 Head Start children, randomly assigned to the following treatments: echoic prompting (children listened to and echoed each sentence in every lesson); parallel prompting (children listened to a sentence for the first picture and, using this as a model, produced the sentence for the second); listening only (no overt speaking response required); and control (pre- and post-tests with no special instruction).

All children were presented with the same materials: 6 stories, each consisting of a maximum of 20 pairs of pictures for which parallel sentence constructions were possible. Different pairs of pictures, not sequenced to form a story, were used in the criterion test.

The hypothesis that children required to produce sentences by modeling would be superior in producing sentences in a similar situation was supported ($p < .001$). Furthermore, the group which echoed each sentence did not do as well as the group which only listened to all the stories.

Comparative Effectiveness of Echoic and Modeling Procedures in Language Instruction with Culturally-disadvantaged Children[1]

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A wide variety of investigations have clearly demonstrated that the performance of children from socioeconomically disadvantaged homes is significantly below that of middle class children. Lesser, Fifer, and Clark (1965) found differences at the .001 level in four basic mental abilities (numerical, verbal, reasoning, and space) not only in terms of social class but also with four ethnic groups. These findings were supported in a replication study by Stodolsky and Lesser (1967), as well as in the comprehensive national report edited by Coleman (1966). Since the type of mental functioning most closely related to academic achievement relies so highly upon language ability, other studies which demonstrate important differences in this specific area (Anastasi and D'Angelo, 1952; Beckey, 1942; Bernstein, 1960 and 1964; Irwin, 1948; Loban, 1963; Templin, 1957; and Thomas, 1962) are particularly relevant. Without exception, the evidence is that disadvantaged children do not have language facility comparable to that of the middle class child.

Deutsch (1965), describing the language environment which characterizes the impoverished home, notes the paucity of verbal interaction and adult language feedback, and particularly the tendency to use incomplete and

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[1]The research reported here was supported by the Office of Economic Opportunity Contract Number 4139, Summer 1967.

ungrammatical sentences. It has been argued by some linguists and sociologists that dialect differences do not necessarily represent deficiencies. However, as Cazden (1966) has effectively pointed out, nonstandard speech, per se, does militate against the attainment of vocational and status goals in the dominant middle class culture. In addition, while the evidence on this point is not quite so clear, it has been hypothesized that restricted language is closely related to impaired cognitive functioning (e.g. Ausubel, 1964). Joan Gussow (1965), after a thoughtful consideration of the problem, concludes that "if the language forms of these populations...are inadequate to the abstract conceptual demands of...complex intellectual disciplines, we have no choice but to intensify our efforts at language modifications."

This view is evident in the pervasive efforts to remediate language deficiencies which characterize all compensatory or intervention programs, at all grade levels. The techniques advocated range from drill type programs such as that of Bereiter and Engelmann (1966) to loosely structured enrichment-experience approaches. The purpose of the present study is to explore a systematic approach to language expansion and improved sentence production which falls somewhere between these extremes. The experimental design provides a comparison of alternative instructional procedures with the same set of materials.

Several related hypotheses were tested:

1) Young children who have been taught to describe pictures through the use of a parallel prompting technique will produce better sentences to new pictures than children who are given the exact utterances to use for both sets

of pictures (echoic prompting) in the instructional program.

2) Both of these procedures are more effective in producing desired changes in verbal behavior than that of listening to stories, with the same sequence of pictures, without speaking.

3) All three of these techniques (echoic prompting, parallel prompting, and listening without responding) will show significant improvement over a control group which receives no special instruction.

4) Across all groups, girls will be superior to boys in parallel sentence production.

Method

Subjects

In two Head Start sites, all children between four and five years of age were randomly assigned to one of four treatments. This provided approximately 12 children per group. All the children in the study were Negro children from one of the most depressed areas of Los Angeles County. Table 1 presents the average chronological and mental ages and the I.Q. for each group.

Instructional Program

The instructional program consisted of six stories recorded on magnetic tape, accompanied by a sequence of paired pictures which illustrated the spoken commentary. The pictures were black-and-white line drawings on regular manuscript sheets, each encased in a plastic protector, and formed into booklets with one-inch rings. (See Appendix A for script and Appendix B for pictures.)

Experimental Treatments

For Treatment 1, the taped commentary provided the appropriate sentence for the first picture and the children were asked to echo this sentence; then the sentence for the second picture was presented and echoed. The treatment consisted of listening to and then echoing each sentence throughout the program.

In Treatment 2, the children heard and echoed the commentary for the first picture. They were then asked to produce the sentence for the second picture, using the first sentence as a model. To balance the number of exposures to the sentences, the procedure was repeated, with the commentary given for the second picture and the child requested to produce the sentence which had previously been given with the first picture. In this way, all children heard the same sentences for all the pictures in the parallel stories, and were exposed to the same number of utterances.

Treatment 3 consisted of listening to all the paired statements, without being required to produce an overt speaking response.

Treatment 4 was a control group which received pre- and posttesting, but no exposure to the stories. They were, however, attending an enriched Head Start program.

On the first two or three days, all the children in the age group specified were given the criterion tests (see below). The program was then administered over a 16-day period, with each presentation lasting about 12 minutes. On the first day an introductory story, to familiarize the children with the procedure and the names of the continuing characters, was given to all children. For the second to sixth days, a new story was

presented each day. These five stories were repeated, in the same order, for the next ten days.

The examiner presented the materials to groups of three or four children, holding up the picture while the tape recorder presented the commentary.

Criterion Tests

All children were given the Peabody Picture Vocabulary Test to provide a pre- and posttest standardized measure of verbal ability. In addition, the Expressive Vocabulary Inventory and the Echoic Response Inventory for Children, developed at UCLA to provide more adequate measures of verbal ability for this population, where administered.

The specific criterion for the parallel sentence training was a test consisting of 15 items, each of which presented a pair of pictures with a sentence given for the first picture and the child expected to produce, by modeling, the sentence for the second. (See Appendix C for test items.) A score of 86 points, based on one point for each grammatical construction which was the same as in the modeled sentence, was possible.

Results

Table 1 presents the means and standard deviations for all groups on

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Insert Table 1 about here

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the pre- and posttest measures. Although the children were randomly assigned to treatment groups, the small number of cases produced several inequitites among the groups. For instance, the Control group was, on the average, several months older than the other groups, and also more mature in terms of mental age. However, none of the between-group differences in pretest mean scores was

large enough to be statistically reliable.

Looking at the within-group scores on the criterion measure, it can be observed that all groups showed raw score gains between pre- and posttesting; it is of particular interest to note that the order of this gain for the parallel prompting and listening groups (9.6 and 10.2, respectively) was more than twice that of the echoic prompting and control groups (4.5 and 3.8 respectively).

The hypothesis that the parallel prompting procedure would be superior to the echoic prompting was supported ($t = 2.20$, df 1/18, $p < .05$). However, when an analysis of variance over all treatments is computed, using pretest score as covariate, the difference between these two groups is dissipated ($F = 1.69$, df 3/37).

To test for differences in performance attributable to sex, the scores of boys and girls across treatments but exclusive of Control were compared. As was predicted, girls received higher scores than boys on the pretest (49.8 compared to 43.8) but, contrary to expectation, gained far less from training (4.7 vs 14.1) and scored 3.4 points lower than the boys on the final criterion test. When these scores are adjusted for initial performance, the mean score for the boys is 7.2 points higher than the girls. While these differences are not statistically significant, they lead to some doubt of the widely-accepted belief that girls excel over boys in the learning of verbal skills.

Discussion

In general, this study suffers from the short period of time over which the instructional program was administered. It is obviously too much to expect that a three-week program will produce important changes in language

patterns which have been established over four or five years. Another problem was the fact that the study was carried out in summer Head Start classes. Attendance in the summer period is far more unstructured and permissive than during the school year. This lack of emphasis on regular attendance also reflects differences in the attitudes of both parents and teachers as to the major focus of summer classroom activities. In other words, these classes are more apt to be play oriented, with many trips to playgrounds, beaches, etc., whereas classes during the regular school year are more academically-oriented. The instructional programs were carried out in competition with outdoor shower baths and water play, improvised swimming pools, sand play, and other exciting outdoor activities.

Within this context, then, it can be anticipated that instructional procedures which require the child to sit still and repeat sentences in a drill-like format will produce considerable negative affect. This was probably true for the echoic prompting treatment. While the children in this group did show some degree of improvement in sentence modeling, their attention was, on the subjective report of the experimenters, the most difficult to maintain. The sentence echoing became a meaningless, rote exercise which produced less improvement in verbal facility than any other treatment, even including the Control. With the modeling procedure, children had more need to respond actively to the program content; with the listening only, the children heard interesting stories without constant interruptions to the flow of the narrative, which occurred with the echoic prompting when the children repeated each sentence as it was spoken. In the listening group, it was usually easy to maintain the child's interest during the first time through the story. Often, however, the children paid little attention during the retelling, and thus probably

most of the learning can be attributed to the first exposure. (It would be interesting to see if a program which did not attempt to balance time across treatments would be as effective with this procedure.)

In spite of these problems, and the small number of subjects in each treatment, the study provided some important insights. With respect to the first hypothesis, the results tend to support the value of the parallel prompting or modeling technique. The data provide some basis for confidence that exposure to well-formed sentence models will facilitate the child's production of appropriate sentences on his own, and that this procedure is more effective than asking the child simply to repeat sentences presented to him.

The unexpected finding was that listening, without being required to produce sentences, was almost as effective in the posttest, which required the child to form his own sentences, as the instructional sequence which gave the child experience in modeling. While the differences between the mean scores of the echoic prompting and the listening group were not large enough to provide a statistically-acceptable level of confidence, neither was the difference between the scores of the modeling and the listening groups statistically significant. Thus the effectiveness or limitation of the listening procedure has not been clearly demonstrated and the second hypothesis was not confirmed.

The third hypothesis, with respect to the control group, was also not supported, inasmuch as the echoic prompting technique produced mean scores which were not significantly different from those of the Control. Finally, the hypothesis with respect to the comparative gains made by girls vs boys was also not supported.

In conclusion, it seems safe to say that instructional procedures which provide experience either in listening to, echoing, or modeling well-formed

sentences do have a facilitating effect on the child's ability to produce appropriate sentences, compared to children who do not have this type of exposure. It also seems safe to say that a procedure which requires repetition in a rote-like or drill setting (echoic prompting) will not be as effective as having the child produce parallel sentences throughout the program or even simply listening to the sentences without speaking. Although it seems logical to assume that children given practice in modeling will subsequently do better in the same task than children who simply sit and listen, the study does not provide sufficient data to firmly support this commonsense inference.

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Table 1

Means and Standard Deviations on Pre - Post Measures

Treatment	N		C.A.	I.Q.		Expressive Vocabulary		Echoic Responding		Parellel Production	
				Pre	Post	Pre	Post	Pre	Post	Pre	Post
Echoic Prompting	12	M	51.6	79.2	80.9	22.8	23.4	11.1	11.2	45.3	49.8
		SD	5.1	16.4	13.0	6.1	6.4	4.6	4.6	13.4	14.8
Parallel Prompting	8	M	52.8	74.6	83.8	22.9	22.3	13.3	12.0	51.5	61.1
		SD	4.8	16.0	19.2	3.4	4.3	4.3	4.8	13.1	8.9
Listening	9	M	55.4	72.3	78.9	25.0	25.4	13.8	13.8	48.1	58.3
		SD	2.2	20.8	20.7	4.6	5.9	4.0	4.0	16.5	11.9
Control	11	M	59.0	84.8	86.0	26.6	29.2	13.6	13.6	52.3	56.1
		SD	6.6	18.3	22.3	6.4	5.5	3.7	4.5	16.3	14.7