DOCUMENT RESUME

ED 055 667 PS 005 148

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TITLE	The Stimulation of Verbal Behavior in Culturally Disadvantaged Three-Year-Olds.
INSTITUTION	Michigan State Univ., East Lansing.
PUB DATE	[70]
NOTE	11p.; Paper is based upon a doctoral dissertation submitted to the Michigan State University, East Lansing, Michigan
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	*Childrens Books; *Culturally Disadvantaged; Home Programs; Paraprofessional School Personnel; Parent Child Relationship; Parent Participation; *Preschool Children; *Verbal Ability; *Verbal Development
IDENTIFIERS	Peabody Picture Vocabulary Test; Stanford Binet Intelligence Scale

ABSTRACT

This study investigated the effects of a program of mother-child interaction using children's books on the verbal skills of culturally disadvantaged 3-year-olds. A total of 47 subjects were involved in the study, with white and black children, males and females equally represented in experimental, placebo and control groups. After only three months of exposure to daily book reading by mothers at home, children in the experimental group scored significantly higher than children in the placebo group on two of the five measures of verbal skills and significantly higher than the control group on four of the five measures. One of the advantages of this project was that the mother became a more effective agent in the language development of her child. (Author/MK)

THE STIMULATION OF VERBAL BEHAVIOR IN CULTURALLY DISADVANTAGED THREE-YEAR-OLDS

by Mary-Clare Boroughs

A number of research studies have been designed to examine the differences in language development and environment among the social classes. McCarthy (1946) reported a consistent positive correlation between socioeconomic status and language proficiency in research up to 1946. Irwin (1948) discovered language differences comparing middle and lower class infants as early as 18 months. Deutsch (1964) notes stimulus deprivation in poverty homes, while Bereiter and Englemann (1966) point to language deprivation as the source of language retardation.

Several factors may be involved in this language deprivation. John (1963) cites lack of sufficient feedback; Cynthia Deutsch (1964) adds the concept of signal-to-noise ratio. Studies of family life such as John and Goldstein (1964) indicate that these families share few planned family activities, or even common meals. Investigation of mother-child interaction such as Hess and Shipman (1965, --) reveal in greater depth some of the differences such as lack of information-giving and feedback when a mother works with her child to solve a problem. There is ample evidence that lack of language proficiency among poverty children relates at least in part to inadequate experiences in the home.

This paper is based upon a doctoral dissertation submitted to Michigan State University. The author is indebted to Dr. Arthur A. Seagull, chairman of the dissertation committee. Author's address: 4993 Hillcrest Avenue, Okemos, Michigan 48864.

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To compensate for this a number of approaches have been taken. Irwin (1960) described a small-scale research project in which stories were read at home to toddlers 18 months and older in which the first differences between experimental and control groups appeared after four months of treatment. Project Head Start has been the most wide-scale attempt to improve on the experiences of the young disadvantaged child. Research studies have also focussed on the infant through day care as well as programs to train young children in the home. A few of these studies utilize the mother as a resource -- either for home training or through training as aides in such settings as Head Start. Preliminary reports and early results from all these studies show that many types of programs do change the ability of the children for the better and that mothers can be a part of the change process. The study reported here was unique in its combined use of paraprofessional workers to make the home contacts, of mothers for the interaction with their own children, and of three-year-olds as the subjects.

Language proficiency can be perceived from several points of view. For this research both receptive and expressive components of language were considered as well as the level of grammatical complexity.[1]

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1. An effort was made to include the functional use of language by the child similar to that described by Hertzig et al (1968). Unfortunately the measures appeared to have a very low test-retest reliability and were dropped from the study.

It was hypothesized that children receiving increased verbal interaction with their mothers as the results of an at-home book reading program would show greater verbal skill than children whose mothers received equal attention in a nutrition education program (placebo) or children who had no interim contact (control).

METHOD

Subjects

The subjects for this study were 47 three-year-olds taken from the rolls of the Family Helpers of Lansing, Michigan -- a school related, state funded, paraprofessional service to referred problem poverty families. There were 26 females, 21 males, 24 Negro and 23 white children in the study.

Dependent Variables

In accordance with the aspects of language proficiency to be included, several different measures were selected. The Stanford Binet Intelligence Scale was included because it is generally considered to test verbal intelligence including both receptive and expressive language. The Peabody Picture Vocabulary Test was added, since it more specifically measures receptive vocabulary. Two expressive measures were developed for the study -- one using responses to six small common objects and toys, and the other using three colorful nursery school pictures. Finally, to measure the level of grammatical structure a mean sentence length score was compiled for each child using all verbal utterances. Test sessions were tape-recorded to increase the accuracy of all measures, and M & M chocolate candies were used regularly to reward participation in the testing situation.

Independent Variables

The experimental group of 19 children received books weekly for 12-13 weeks. Two library books a week were distributed by Family Helpers. Children also received, at weekly intervals, nine small paperback books to keep. (All children received a total of ten books, placebo and control children receiving their full set at the end of post-testing.) In addition about one-half of the mothers attended one or two meetings at which Head Start teachers demonstrated reading to a child and all mothers received five simple flyers designed to encourage conversation and to widen experiences through the world of books. The library books (a circulating library of 150 books) were provided by the three libraries in the area -- state, county and city facilities.

The placebo group of 14 children was enrolled in a nutrition education program. Mothers received weekly pamphlets published by national and state health agencies and distributed to them by the Family Helpers. One-half of the mothers also attended one or two informal meetings with a public health nutritionist.

The control group of 14 had no contacts with the Family Helpers beyond their regular needs.

RESULTS

The overall multivariate F for the ten tests was 2.48 (df = 20, 32; $p < .01$). For this reason and because there were a priori hypotheses with respect to the effects of differential treatment for each of the five selected measures, the Dunnett t-test (Winer, 1962, pp. 89 ff.) was employed. Table 1 presents the means (adjusted for pre-test scores) for the five tests.

TABLE 1

MEANS (ADJUSTED) FOR TREATMENT GROUPS FOR THE FIVE INDEPENDENT MEASURES

	Measure				
Treatment Condition	Binet	PPVT	Exp.1	Exp.2	MSL
Experimental (n=19)	95.64	82.84	45.20	47.44	4.32
Placebo (n=14)	91.10	79.75	32.20	40.17	4.26
Control (n=14)	90.17	73.31	36.68	32.78	3.72

A 2(Sex) x 2 (Race) x 3 (Treatment) analysis of covariance was applied to the post-test data using the least squares solution for unequal cell frequencies. Correlations with the following variables were examined to select the necessary covariates: pre-test scores for each measure, age, number of siblings, presence of a father in the home, opportunities outside the home, working mother, and place and level of mother's education. The only significant correlations were the pre-test measures and these were selected as the covariates. Only one interaction was significant and that will be presented below.

Stanford Binet Intelligence Scale

As Table 1 indicates, the mean Binet scores for the three treatment groups were in the predicted order. Moreover, the results of the Dunnett's tests indicate that the predicted differences were significant: comparing the experimental group with the placebo group, $t = 2.56$ ($df = 34$, $p < .05$); comparing the experimental group with the control group, $t = 3.08$ ($df = 34$; $p < .005$).

Peabody Picture Vocabulary Test

As Table 1 indicates, the mean Peabody scores for the three treatment groups were in the predicted order. However, only the difference between the experimental and control groups was significant, $t = 2.28$ ($df = 34$, $p < .05$).

Moreover, since the interaction between Sex and Treatment was significant ($F = 3.83$, $df = 34$, $p < .05$) for this test, the simple main effects were also examined using Dunnett's t-test. Table 2 presents the means for treatment conditions separately for sex.

TABLE 2

MEANS (ADJUSTED) FOR TREATMENT GROUPS SEPARATELY BY SEX FOR THE PEABODY PICTURE VOCABULARY TEST

	Sex	
Treatment Group	Male	Female
Experimental	75.49	89.46
Placebo	83.91	74.34
Control	70.53	75.72

Table 2 indicates that for males only the difference between the experimental and the control groups was in the predicted direction. Moreover, the results of the Dunnett's test indicate that no differences were significant. On the other hand, the mean Peabody scores for females were in the predicted order. Moreover, the results of the Dunnett's tests indicate that the predicted differences were significant: comparing the experimental group with the placebo group, $t = 3.62$ ($df = 34$; $p < .005$); comparing the experimental group with the control group, $t = 3.29$

(df = 34, $p < .005$).

Expressive Measure #1

As Table 1 indicates, the mean Expressive 1 scores for the three treatment groups were in the predicted order. However, only the difference between the experimental and the placebo groups was significant, t = 2.00 (df = 34, $p < .05$).

Expressive Measure #2

As Table 1 indicates, the mean Expressive 2 scores for the three treatment groups were in the predicted order. However, only the difference between the experimental and the control groups was significant, t = 2.23 (df = 34, $p < .05$).

Mean Sentence Length

As Table 1 indicates, the mean sentence length scores for the three treatment groups were in the predicted order. However, only the difference between the experimental and the control groups was significant, t = 2.31 (df = 34, $p < .05$).

DISCUSSION

The results of this study show that a three month program designed to stimulate verbal interaction between disadvantaged mothers and their three-year-olds through the medium of children's books did have an effect on verbal skill greater than that found in either placebo or control groups. There was some indication that the placebo situation also may have had an effect on the children but to a lesser degree.

Irwin (1960) found his first significant differences after four months and the differences between the three groups widened appreciably over the full 18 month period of the study. It can there-

fore be predicted that the changes appearing here after only three months would also widen over a longer period. Furthermore, the high level of cooperation in the experimental group (a five percent loss as compared with 25 percent for the two control groups) showed that the program was appealing to both workers and mothers. A more extended research study is needed to examine effects over time.

In the meantime the project recommends itself as an action program for disadvantaged families. Gains are measurable, parent cooperation is feasible, paraprofessional workers can manage the project. In addition, the mother becomes a more effective agent in the language development of her child. As in the Gray study (1966) such a project can also be expected to diffuse to other younger children in the family.

While an initial outlay of books is needed, controlled circulation can continue the books in use. In the study reported here out of 150 books distributed over three months only five books were lost and two or three damaged. As libraries move into a widening view of their service to the public, such a project would make an excellent use of their facilities.

As an extention of Head Start a book program designed for younger children would give them an even earlier head start. The involvement of mothers in this simple at-home project might well prepare them to gain more readily from the parent involvement programs of Head Start itself.

In summary then, the results of this study show that it is possible to improve language skills of young disadvantaged children

by providing pre-school books for mother-child storytime. Such a program is recommended as a part of efforts to remediate the effects of poverty.

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