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ABSTRACT

A 3-month pilot project was undertaken at the University of Texas to gain experience in administering the Cynthia Buchanan Language Program (Buchanan, 1967) and to test its effectiveness in making meaningful changes in the language development of disadvantaged Mexican-American preschoolers. A group of 114 Mexican-American children were chosen as experimental subjects who would receive instruction from the Buchanan Program, while another group of 101 subjects served as the control. It was hypothesized that while both groups would make significant gains in language development, the rate of gain of the experimental group would be significantly greater than that of the control group. Both groups were pre- and posttested with the Metropolitan Readingess Test, the Murphy-Durrell Reading Readiness Analysis, the Gates Reading Readiness Test, and the Lee-Clark Reading Readiness Test. The results solidly supported the hypothesis. Next, an analysis of covariance was run on the data to determine whether or not the results were generalizable to all levels of beginning scores. The results of the analysis indicated that they were not generalizable. (MH)

PART OF THE FINAL REPORT

ON

HEAD START EVALUATION AND RESEARCH: 1968-69

TO

THE OFFICE OF ECONOMIC OPPORTUNITY
(Contract No. OEO-4115)

CHILD DEVELOPMENT EVALUATION AND RESEARCH CENTER

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The University of Texas at Austin

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A PILOT PROJECT USING A LANGUAGE DEVELOPMENT PROGRAM WITH PRESCHOOL DISADVANTAGED CHILDREN

Grover Cunningham
John Pierce-Jones

This study was supported by Contract No. OEO-4115 between the Office of Economic Opportunity, Project Head Start, and The University of Texas at Austin.

A Pilot Project Using a Language Development Program with Preschool Disadvantaged Children

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Prior to launching a full year use of the Cynthia Buchanan Language Program (Buchanan, 1967), a pilot project of three months duration was undertaken. The purpose of the project was to gain experience in administering the program and to test the effectiveness of the Program in accomplishing worthwhile changes in the language development of Mexican-American, disadvantaged, preschool children in a preliminary way. This report summarizes the changes effected and contrasts the progress of the group selected for experimental treatment with a group within the same school system whose program of instruction was within the usual curriculum of the school.

The primary hypothesis of the study was that while both Experimentals and Controls would show significant gains in language development, the rate of gain of the Experimentals would be significantly greater than that of Controls. Since our primary hypothesis was confirmed, the data were also used to explore the following question: Are the results obtained generalizable across the entire range of pretest scores?

Subjects

A group of 114 preschool children of Mexican-American extraction in six classes was chosen as experimental subjects. Within the same preschool program 101 subjects in another six classes with the same ethnic composition were selected as controls. The following is a comparison of the groups:

	Experimentals	Controls
Number	114	101
Mean age in months	70.25	70.84
Standard deviation of age in months	4.05	3.70
Males - N	54	54
Females - N	60	47

Tests

The following tests were administered at approximately the same time to both experimental and control subjects on two occasions:

Metropolitan Readiness Test (Hildreth, et al., 1965)
Murphy-Durrell Reading Readiness Analysis (Murphy and Durrell, 1965)
Gates Reading Readiness Test (Gates, 1942)
Lee-Clark Reading Readiness Test (Lee and Clark, 1962)

Alternate forms of the Metropolitan were administered on the two occasions. Pretesting was completed immediately before the beginning of the program of instruction, and posttesting after 3 months of instruction. Teachers administered the tests on a group basis.

Results

Table 1 sets out a comparison of the means of Controls and Experimentals at pretesting. It reveals that significant differences between the two groups existed on only 5 of 26 comparisons possible on the four tests administered. Significance was tested by use of a *t*-test. In one case the Controls exceeded the Experimentals on the skills in question, and in four cases the Experimentals were the "better." On none of the total test scores were there significant differences between the groups.

In order to analyze changes, if any, in the groups over time, a subjects by trials analysis of variance design was employed (Veldman, 1967).

Tables 2, 3 and 4 compare the two groups over time on all tests which are scored to yield a total score. In every case these analyses revealed that, while both groups changed significantly over time, the rate of change of Experimentals was greater than that of the Controls.

Table 5 compares the gain scores of the two groups. It indicates that on 12 of the 26 comparisons, Experimentals gained more than did Controls. Nine of these 12 differences in gain were statistically significant at the .05 level or greater. The 9 variables on which Experimentals demonstrated a statistically greater rate of change were:

Metropolitan
Alphabet
Total Score

Murphy-Durrell
- Letter Names II
  - Total Letter Names
    - Total Score

Gates
- Letters and Numbers

Lee-Clark
- Concepts-Vocabulary
- Word Symbols
  - Total Score

On only 2 of the subscales of the tests did the Controls show a significantly greater rate of change than the Experimentals. These two variables are:

Murphy-Durrell
- Learning Rate

Gates
- Word-Card Matching

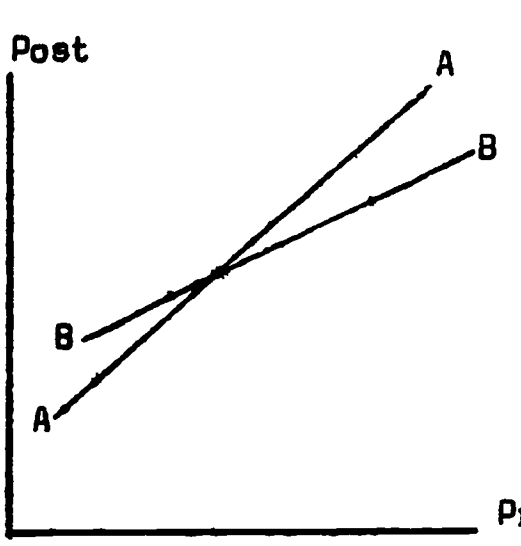
In order to analyze the question of whether or not group gains are generalizable to all levels of beginning scores an analysis of covariance was done (Veldman, 1967). The analysis furnishes an answer to the question of whether or not the slopes of the regression lines of the two groups, developed from the data, where prescores are plotted on the abscissa and post scores plotted on the ordinate, are probably the same. The analysis indicates that the slopes of the lines of the two groups differ significantly only on the following scores:

Murphy-Durrell
- Phonemes - Part I
- Phonemes - Part II
  - Total Phonemes

Gates
- Picture Directions
- Rhyming

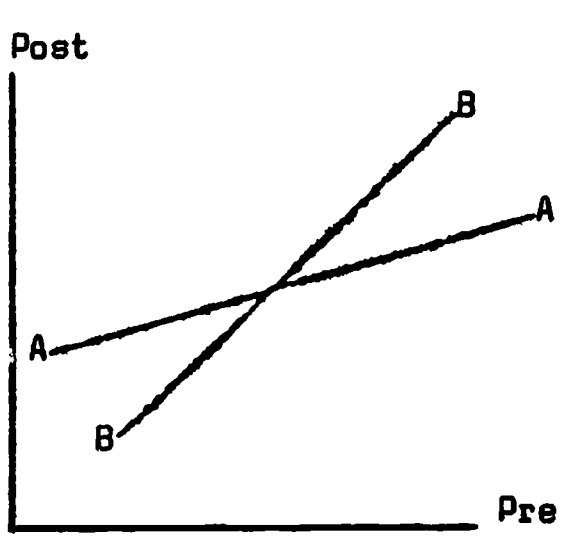
Another way of stating the question answered by covariance in this situation is: If subjects in the two groups have the same beginning scores, is the expected gain the same in either group? The following are illustrative graphs of the regression lines where significant differences in slopes were found:

Total Phonemes



Group A - Exper. Slope = .546
Group B - Cont. Slope = .13
F = 13.27 with 1 and 186 D.F.
P = .00

Rhyming



Group A - Exper. Slope = .10
Group B - Exper. Slope = .45
F = 10.64 with 1 and 180 D.F.
P = .00

Other slope data are as follows:

Phonemes - Part I
Exper. Slope = .51
Cont. Slope = -.02
F = 7.64 with 1 and 186 D.F.
P = .01

Phonemes - Part II
Exper. Slope = .45
Cont. Slope = -.12
F = 13.04 with 1 and 186 D.F.
P = .00

Picture Directions
Exper. Slope = .71
Cont. Slope = .38
F = 7.23 with 1 and 180 D.F.
P = .01

These significant slope differences mean: (1) we cannot safely generalize change scores across all levels of beginning scores; (2) that those subjects who begin with low scores on Phonemes, subtest

scores, and Picture Directions will do better in the Control group than in the Experimental group but the reverse is true as to subjects scoring high; and (3) that the reverse situation to that at (2) is existent as to Rhyming.

Conclusions

The worth of a curriculum program such as that used here seems to be well documented by this trial run. The Metropolitan manual states:

> "Alphabet gets at the child's ability to recognize letters of the alphabet when these are spoken by the examiner. This ability has been demonstrated to be among the best predictors of success in the early stages of reading."

Experimentals were moved from about the 10th percentile to the 50th percentile by this program. Since this general result exists in all the scores it seems appropriate to make a claim for the value of the program. Particularly where as here the Controls and Experimentals started at approximately the same place and the Controls presumably received an unstructured program.

TABLE 1

Test Score Comparisons of Experimentals (N = 111)

and Controls (N = 101) at Pretesting

Tests	Means		Difference
	Controls	Experimentals	Exp-Control
Metropolitan			
Word Meaning	4.72	4.40	- .32
Listening	4.91	5.08	.17
Matching	2.72	2.99	.27
Alphabet	3.37	2.87	- .50
Numbers	3.93	4.09	.16
Copying	4.18	3.32	- .86
Total Score	23.73	22.74	- .99
Murphy-Durrell			
Phonemes - Part I	5.89	5.40	- .49
Phonemes - Part II	8.28	7.31	- .97
Total Phonemes	14.17	12.71	-1.46
Letter Names I	5.04	6.18	1.14
Letter Names II	4.07	4.83	.76
Total Letter Names	9.11	11.01	1.90
Learning Rate	4.16	6.80	2.64**
Total Score	27.44	30.23	2.79
Gates Reading Readiness			
Picture Directions	17.90	20.88	2.98*
Word Matching	6.94	9.18	2.24*
Word-Card Matching	7.71	9.30	1.59*
Rhyming	7.19	8.07	.88
Letters and Numbers	7.57	7.29	- .28
Lee-Clark			
Letter Symbols-Matching	7.10	6.33	- .77
Letter Symbols-Cross Out	5.36	4.18	-1.18
Total Letter Symbols	12.49	9.89	-2.60*
Concepts-Vocabulary and following instructions	13.16	12.03	-1.13
Word Symbols-Identification of Letters and Words	6.84	7.43	.59
Total Score	32.97	29.44	-3.53

* Difference significant at .05 level
** Difference significant at .01 level

TABLE 2

Subjects By Trial Analysis of Variance

on Total Metropolitan Scores

	Means			
	Pre	Post	Gain	Group
Controls (N = 87)	23.77	39.86	16.09	31.82
Experimentals (N = 100)	22.90	43.06	20.16	32.98
Trial Means	23.30	41.57		

Source	Mean Square	F	P
Between Groups	126.05	.40	.54
Within Trials	31200.68	481.04	.00
Groups by Trials	384.46	5.94	.02

TABLE 3

Subjects By Trial Analysis of Variance

on Total Murphy-Durrell

	Means			
	Pre	Post	Gain	Group
Controls (N = 90)	27.64	49.42	21.78	38.53
Experimentals (N = 99)	29.83	60.41	30.58	45.12
Trial Means	28.79	55.18		

Source	Mean Square	F	P
Between Groups	4092.01	7.95	.01
Within Trials	65820.49	459.45	.00
Groups by Trials	1828.73	12.76	.00

TABLE 4

Subjects By Trial Analysis of Variance

on Total Lee-Clark

	Means			
	Pre	Post	Gain	Group
Controls (N = 90)	33.17	43.08	9.91	37.12
Experimentals (N = 96)	29.22	45.00	15.78	38.12
Trial Means	31.13	44.07		

Source	Mean Square	F	p
Between Groups	95.31	.25	.63
Within Trials	15574.33	249.04	.00
Groups by Trials	800.33	12.80	.00

TABLE 5

Gain Score Comparison of

Experimentals (N = 114) and Controls (N = 101)

Tests	Gains: Controls	Gains: Experimentals	Difference Exp-Control
Metropolitan			
Word Meaning	1.38	.73	- .65
Listening	4.01	3.23	- .78
Matching	3.80	3.41	- .39
Alphabet	2.25	6.26	4.01**
Numbers	4.68	3.66	-1.02
Copying	3.45	2.81	- .64
Total Score	16.09	20.16	4.07*
Murphy-Durrell			
Phonemes - Part I	5.63	5.04	- .59
Phonemes - Part II	5.43	7.05	1.62
Total Phonemes	9.94	12.08	2.14
Letter Names I	5.87	7.77	1.90
Letter Names II	4.07	8.94	4.87**
Total Letter Names	8.81	16.71	7.90**
Learning Rate	4.20	1.51	-2.69**
Total Score	21.78	30.58	8.80**
Gates Reading Readiness			
Picture Directions	4.60	2.13	-2.47
Word Matching	1.95	1.39	- .56
Word-Card Matching	4.93	2.09	-2.84**
Rhyming	2.12	.96	-1.16
Letters and Numbers	9.00	15.22	6.22**
Lee-Clark			
Letter Symbols-Matching	1.64	1.79	.15
Letter Symbols-Cross Out	2.97	2.92	.05
Total Letter Symbols	4.57	5.42	.85
Concepts-Vocabulary and following instructions	2.13	3.72	1.59**
Word Symbols-Identification of letters and words	4.05	6.75	2.70**
Total Score	9.91	15.78	5.87**

* Difference significant at .05 level

** Difference significant at .01 level

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