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By-Cunningham, Grover

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A study was conducted to determine if the observed changes in Head Start children were related to the practice effects inherent in a test-retest situation. The "control" group consisted of 64 children who had been eligible for a Head Start program. They roughly matched a group of Head Start (HS) children in IQ scores, age, and socioeconomic level. On two occasions, with about 83 days between testings, the Stanford-Binet and Preschool Inventory tests were administered to the control group. The same tests had been administered to the HS group in a study by Temp and Anderson in 1967. The control group did not have a statistical gain in Stanford-Binet IQ scores, whereas the HS group did have. On the Preschool Inventory both groups showed statistically significant gains in most instances. The results support the position that the gains in the Stanford-Binet IQ scores were atrributable to Head Start practices and that the increases in the Preschool Inventory scores were attributable to maturation. The Preschool Inventory should be scored to allow for maturational differences. Tabulated data are included. (JS)

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(Contract No. OEO-4115)

CHILD DEVELOPMENT EVALUATION AND RESEARCH CENTER

John Pierce-Jones, Ph.D., Director

The University of Texas at Austin

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ABSTRACT

An attempt was made in this research to determine if the observed worthwhile changes in Head Start children were related to the practice effects inherent in a test-retest situation. The sample was drawn from a population of children eligible for Head Start and which proved to be similar in Stanford-Binet IQ level. The results indicate there was no significant increase in IQ level of this "control" group but there were significant increases in Preschool Inventory raw scores.

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The University of Texas at Austin

Various studies have shown that children who participate in Head Start programs show statistically significant gains in intelligence on the Stanford-Binet Intelligence Test and on the scores of the Preschool Inventory (Temp and Anderson, 1967). These observed gains, however, could have been "caused" by factors other than Head Start intervention. Some factors which might be the source of the change are maturation, outside experiences and testing effects.

The present research was designed to narrow, if possible, the range of possible explanations of this observed worthwhile change. Of particular interest was the question of whether or not testing effects could explain this change. The approach to narrowing the possible explanations was undertaken by making the same observations of a group of non-Head Start children, who were logical candidates for Head Start, as were made of Head Start children. While no rigorous standards were imposed, something of a control group was obtained in order to compare these controls with the experimentals--the Head Start children.

Method

Subjects

A group of 64 preschool children was chosen at random from a list of children who were eligible to participate in Head Start, but had not participated in Head Start or any other known preschool program. The list had been compiled by a school district in some of its school census activities and the children on the list had been verified as eligible for Head Start participation.

Tests

The Stanford-Binet (SB) and the Preschool Inventory (PSI) were administered to the sample on two occasions. The average interval between tests was 83 days; the range of the interval was from 56 days to 123 days; the standard deviation was 15 days.

Results

The results concerning the observations or testings of the "control" group as to the Stanford-Binet are presented in Table 1. Table 2 covers the results of Preschool Inventory testings. The statistical test for significance was by means of a subjects-by-trial analysis of variance design.

Table 1

Stanford-Binet Results (N = 64)

	MEANS		
	Chronological Age in Months	Mental Age in Months	IQ
First Observation	74.80	67.50	89.45
Second Observation	77.61	69.87	89.31
No significant statistical gain	2.81	2.37	.14

Table 2

Preschool Inventory Results

		MEAN SCORES		
Scale	Possible	First Observation	Second Observation	Statistically Significant ($p < .05$)
1	26	19.51	20.64	Yes
2	26	13.11	13.08	No
3	19	11.13	12.70	Yes
4	19	15.33	16.19	Yes
Total	90	59.07	63.13	Yes

Table 3 presents the intercorrelations of the pre and post scores.

Discussion

The "control" group was studied primarily for the purpose of determining if the statistically significant gains noted in Head Start programs also occur in a somewhat similar (similar as to socioeconomic status and IQ level) population. One reference group of Head Starters was that of Temp and Anderson (1967). A part of the results they reported are set out in Tables 4 and 5.

Table 3

Intercorrelation of Pre and Post Scores

	1	2	3	4
1. PSI Total-Pre		.83	.71	.54
2. PSI Total-Post			.54	.47
3. SB IQ-Pre				.81
4. SB IQ-Post				

Table 4

Observation of Head Start Classes

Stanford-Binet, Short Form (79 Classes)

	MEANS		
	Actual Age in Months	Mental Age in Months	IQ
First Observation	69.5	60.0	85
Second Observation	71.0	63.5	89+
Statistically Significant Gain	1.5	3.5	4.5

Table 5

Observation of Head Start Classes

Preschool Inventory (79 Classes)

MEAN SCORES

Preschool Inventory	Possible	First Observation	Second Observation	Statistically Significant Gain
Subscore 1	26	18	20	Yes
Subscore 2	26	11	12	Yes
Subscore 3	19	10	11	Yes
Subscore 4	19	14	15	Yes
Total Score	90	53	58	Yes

A comparison of our "control" group with Temp and Anderson's group reveals that, in fact, the control group of the present study was roughly similar in IQ level. Subjects had a mean chronological age (CA) at the first observation of 6 years, $2\frac{1}{2}$ months, while the Temp-Anderson group averaged 5 years, $9\frac{1}{2}$ months. At the second observation the control group had a mean CA of 6 years, $5\frac{1}{2}$ months, while the latter group had a mean of 5 years, 11 months. Although age differences existed between the two groups, they were relatively comparable as to socioeconomic level, IQ scores and age.

Thus we turn to the question of comparing the gains of the two groups. The tables show that in Temp and Anderson's group there was significant statistical gain in Stanford-Binet IQ scores, and mental ages did increase more than the increase in chronological age. However, in the control group there was no gain in IQ scores, and mental age increases did not reach the level of chronological age increases. On the Preschool Inventory both groups showed statistically significant gains in most instances. Gains were roughly of the same order, however, the controls scored at their pre-testing where experimentals scored at their post-testing.

Conclusions

The foregoing facts lend further support to the position that the observed worthwhile changes in Stanford-Binet IQ scores by Head Start children are attributable to the Head Start intervention. This position counters the argument that the Head Start changes observed are due to practice effects which are inherent in a test-retest situation. However, the facts also reveal that the Preschool Inventory changes do not support such a position. The usefulness of the Preschool Inventory would probably be increased by scoring in a fashion that would make some allowances for maturation. The results also extend the evidence for IQ stability (Bayley, 1949 & 1955, Honzik, et al., 1948, and Sontag, et al., 1958) to a population of lower IQ levels, since most previous studies have dealt with average and above IQ levels.

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