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ABSTRACT

This paper briefly summarizes the findings of a study of the effects of the Follow Through Primary Education Project-Individually Prescribed Instruction (PEP-IPI) model. The project was designed to provide individualized instruction (with emphasis on perceptual and motor abilities, language concepts, classifying skills and reasoning abilities) to disadvantaged children in kindergarten through third grade. The individualization was accomplished through diagnosis of pupil achievement using a content-referenced testing program followed by the development and implementation of prescriptions. The PEP-IPI children, when compared with their respective controls, showed significant gains on standardized indices of achievement. (ED)

CHANGES IN SCHOLASTIC ACHIEVEMENT OF DISADVANTAGE CHILDREN ENROLLED IN FOLLOW THROUGH PEP-IPI PROJECT

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ABSTRACT

CHANGES IN SCHOLASTIC ACHIEVEMENT OF DISADVANTAGED CHILDREN ENROLLED IN FOLLOW THROUGH PEP-IPI PROJECT

Children's academic performance was examined at the end of one, two, or three years of receiving prescriptive educational treatment known as the Primary Education Project-Individually Prescribed Instruction (PEP-IPI). The project provided for individualization of learning from kindergarten through the third grade. The individualization was accomplished through diagnosis of pupil achievement using a content-referenced testing program followed by the development and implementation of prescriptions. The PEP-IPI children, when compared with their respective controls, evidenced significant gains on standardized indices of achievement.

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Academic deficiences that are frequently encountered amoung disadvantaged children include a lessened ability to use standard English, less highly developed arithmetic concepts and perceptual styles, a lower motivation for achievement, and the possibility of depressed self-concept. Although the literature abounds with descriptions of compensatory programs designed to attenuate these deficiences, careful scrutiny indicates little evidence of program success. With the exception of a few studies (e.g., Weikart, 1969) most research is limited to demonstration of short range improvement (e.g., Guidubaldi, Wexley & Kehle, 1974). Other studies (e.g., Westinghouse and Ohio State University, 1970) indicate a deterioration of early compensatory program effects as the children progress through the primary grades. Observed failures of compensatory programs appear related to lack of an adequate theoretical foundation for program development and a circumvention of preliminary research necessary to make informed decisions about inclusion of program components. Consequently, Follow Through models were designed to accumulate evidence of various theoretical models with respect to their effectiveness in maintaining early gains and thus in enhancing the equality of educational opportunity. Although not mutually exclusive, there are currently twenty-one different Follow Through sponsors representing a variety of different theoretical approaches. The purpose of the present study was to investigate the effects on academic performance of one such model: Primary Education Project-Individually Prescribed Instruction (PEP-IPI).

The theoretical foundation of the PEP-IPI model may be simplistically stated as involving an emphasis on maturational processes (Piaget, 1952) and the learning beyond these processes (Gagne, 1965). Thus, the PEP-IPI model is premised on both cognitive development and cumulative learning theories while stressing the individualization of instruction. Specifically, the PEP portion of the model focuses on developing perceptual and motor abilities, language concepts, classifying skills and reasoning abilities; IPI focuses on developing definite skills in reading and mathematics. The structure of the model was designed to facilitate easy and quick implementation by teachers. Individualization was accomplished through diagnosis of pupil achievement using a content-referenced testing program followed by the development and implementation of prescriptions. Parents were involved in the model to the extent that they were instructed in the use of home-based learning strategies.

The rather discouraging results of compensatory programs may have been due to a variety of reasons arising from the inadequate consideration of the combined theoretical assumptions. Therefore, the PEP-IPI model attempts to take into account the fact that individual differences in cognitive abilities are, to a degree, influenced by both developmental and environmental factors.

METHOD

Subjects

The sample population was drawn from a large urban elementary school designated as a site of the Follow Through Project. When the program was initiated in 1969 this site had a population of approximately 1200 pupils in grade levels kindergarten through six. The PEP-IPI project involved grade levels kindergarten through three. Each of these grade levels were divided into five classrooms, four were designated as comprising the experimental group and the remaining classroom served as a control. Class size was limited to 25 pupils. The experimental group was made up of the entire Follow Through population but excluded those Follow Through pupils who entered the program after kindergarten or left the program before completion of the fourth grade. The control group was comprised of pupils who were not involved in Follow Through from kindergarten through the third grade. A total of 160 male and 154 female children were involved in the study. All the children came from the same neighborhood, over 90% had experienced Head Start, and 95% were Black.

Four analysis groups were created corresponding to the following cohorts: Cohort I was comprised of kindergarteners who entered Follow Through in the Fall of 1969 and completed four years of treatment in 1973. There were 42 subjects in the experimental group and 8 in the control group. Cohort II was comprised of kindergarteners who entered Follow Through in the Fall of 1970 and completed four years of treatment in 1974. There were 62 experimental and 12 control subjects. Cohort III began with kindergarteners who entered Follow Through in the Fall of 1971 and will complete four years of treatment in 1975. There were 65 experimental and 11 control subjects. Cohort IV was the final group with kindergarteners who entered Follow Through in the Fall of 1972 and will complete four years of treatment in 1976. This group was comprised of 84 experimental and 30 control subjects.

Materials and Procedures

The dependent variables included pupil performance on the Metropolitan Readiness, California Test of Mental Maturity, Metropolitan Upper Primary Reading, and the Ohio Survey Test. All test scores were converted to normalized standard scores (stanines). Hypotheses concerning program effect were formulated in terms of a longitudinal design within cohort and a cross sectional design across cohorts. The 50 experimental and control subjects comprising Cohort I were tested at four points: kindergarten; second grade; fourth grade Fall; and fourth grade Spring. Cohort II, with 74 subjects, had three testing points: first grade; second grade Fall; and second grade Spring. Cohort III was comprised of 76 subjects and had two testing points: first grade; and second grade Fall. Finally, Cohort IV had 114 subjects and one testing point: first grade.

RESULTS

The analyses involved both longitudinal and cross sectional designs. The mean stanine scores are indicated in Table 1.

Table 1: PEP-IPI Group Mean Stanine Scores for Cohorts I, II, III, and IV as a Function of Testing Time and Dependent Measure

Cohort	Testing Time	Dependent Measure	Control	Experimental
I	Kdg. (1969)	Met. Readiness	3.38	4.95
	Gr. 2 (1971)	Cal. Mental Mat.	2.38	3.64
	Gr. 4 (Fall, 73)	Ohio Survey:		
		Reading	2.38	2.83
		English	2.50	2.90
		Mathematics	1.50	2.95
	Gr. 4 (Spr., 74)	Ohio Survey:		
		Reading	2.13	3.02
		English	2.38	3.50
		Mathematics	1.88	3.19
II	Gr. 1 (1971)	Met. Readiness	3.58	5.68
	Gr. 2 (Fall, 72)	Cal. Mental Mat.	3.58	3.82
	Gr. 2 (Spr., 73)	Met. Upper Primary	3.42	3.84
III	Gr. 1 (1972)	Met. Readiness	3.18	4.74
	Gr. 2 (1973)	Cal. Mental Mat.	2.91	3.75
IV	Gr. 1 (1973)	Met. Readiness	4.30	5.27

With respect to the cross sectional design, first grade subjects in Cohorts II, III, and IV were compared on the basis of their performance on the Metropolitan Readiness Test. The results indicate significant differences existed between Cohorts ($p < .03$) and as a function of treatment ($p < .0001$). The Scheffe method of multiple comparisons revealed that Cohort III and IV differed significantly ($p < .05$). The differences between control and experimental groups across Cohorts II, III, and IV for first grade performances on Metropolitan Readiness were highly significant ($p < .001$). Consequently, it is clearly evident that the PEP-IPI model has substantially benefited the children in this regard. Finally, with respect to the cross sectionally design, second grade subjects in Cohorts I, II, and III were compared on the basis of their performances on the California Mental Maturity Test. The results indicate that significant differences did not exist between Cohorts; however, the experimental

groups evidenced significant gains over the controls across the three Cohorts ($p < .01$). The mean stanines for both of the above cross sectional analyses are graphically displayed in Figure 1.

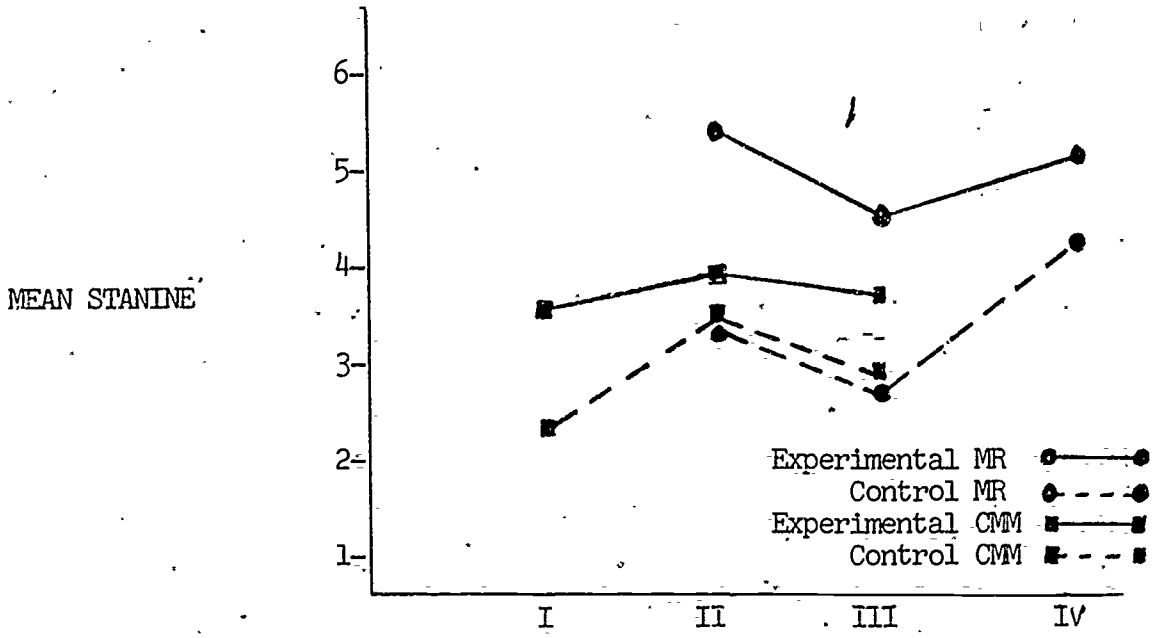

Figure 1. Mean stanines for first grade students on the Metropolitan Readiness Test (MR) in Cohorts II, III, and IV and for second grade students on the California Mental Maturity Test (CMM) in Cohorts I, II, and III.

With respect to the longitudinal design, the subjects in Cohort I were observed for five years; i.e., four years of membership in either the experimental or control group plus a year of follow-up. The data were subjected to repeated measures analysis of variance. As illustrated in Figure 2, the results indicate that subjects in the experimental group maintained a significant advantage over the controls throughout the five years of the project ($p < .01$).

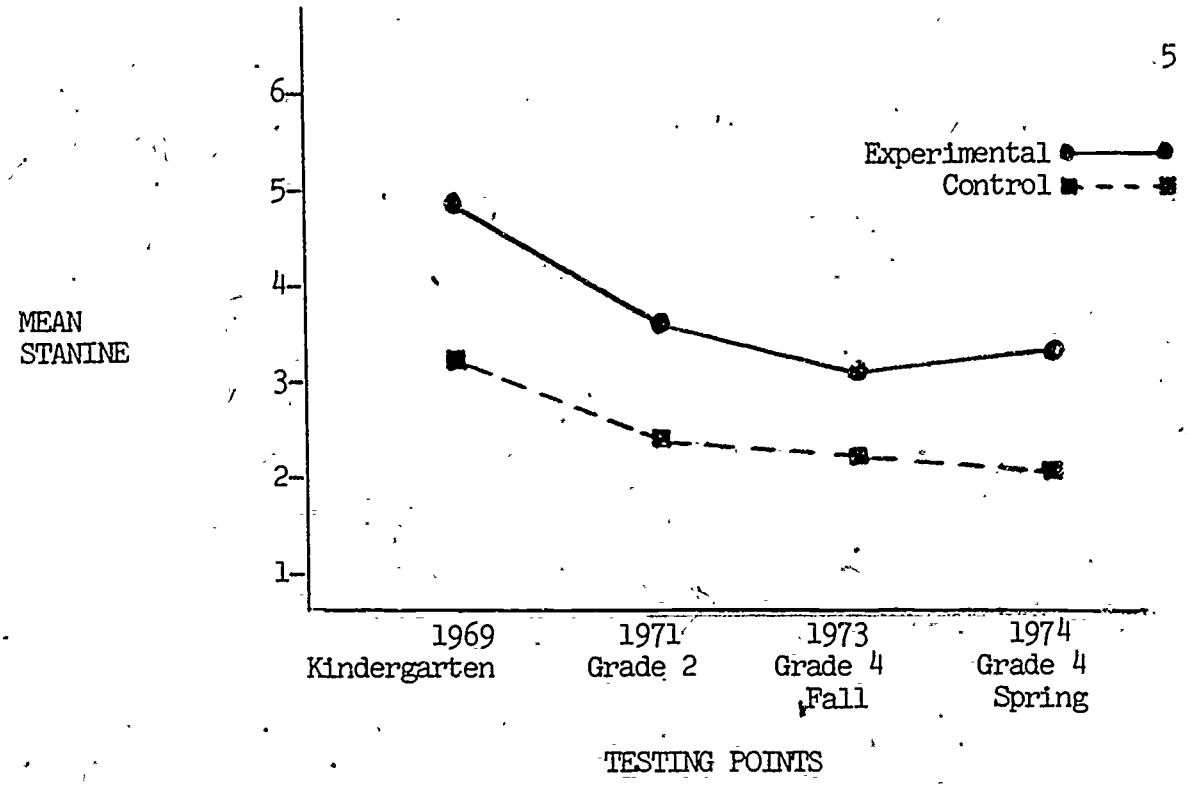

Figure 2. Mean stanines for Cohort I subjects across five years of treatment and four testing points. In 1969, the Metropolitan Readiness was administered; in 1971 the California Test of Mental Maturity was used; and in the Fall and Spring of 1973 and 1974 respectively, the Ohio Survey was administered (the Ohio Survey subtests of Reading, English, and Mathematics are reported as a single mean score).

The significant longitudinal effect of the PEP-IPI model on Cohort I children's achievement data apparent in Figure 2 above is replicated in the longitudinal analyses of Cohort II and III (Figure 3). Even though a significant interaction occurred between group membership and testing time in Cohort II ($p < .002$) the results are consistent with Cohort I to the extent that the effect of the experimental treatment approached significance ($p < .06$). Further, as illustrated in Figure 3, the effect of the experimental treatment in Cohort III was highly significant ($p < .006$). Consequently, in three separate longitudinal investigations involving the PEP-IPI model as the experimental treatment with durations of four, three, and two years respectively, there have been impressive and enduring results.

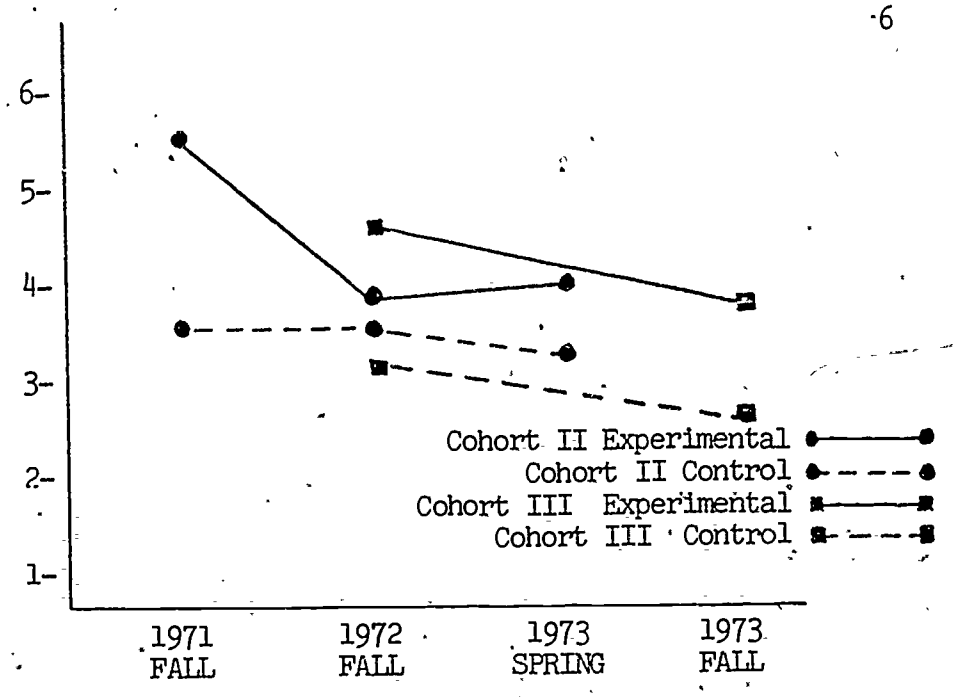

Figure 3. Mean stanines for Cohorts II and III subjects. For Cohort II, Metropolitan Readiness Test was administered in first grade (Fall, 1971); the California Mental Maturity Test and the Metropolitan Upper Primary Reading Test were administered in the second grade (Fall, 1972 and Spring, 1973 respectively). For Cohort III, the Metropolitan Readiness Test was given in first grade (Fall, 1972), and the California Mental Maturity Test was given in second grade (Fall, 1973).

In summary, the cross sectional analyses of Cohort II, III, and IV along with the longitudinal analyses of Cohort I, II, and III clearly show unambiguous support for the significant influence of the PEP-IPI model on disadvantaged children's academic achievement.

DISCUSSION

The results clearly indicate that the Follow Through PEP-IPI model substantially influenced the academic achievement of the disadvantaged children involved. Both the cross sectional and the longitudinal designs gave consistent and highly significant support to the value of compensatory intervention based on the combination of the theoretical positions of Piaget (1952) and Gagne (1965).

In addition, it was noted that since the beginning of the project, only one teacher requested transfer as compared to the average request before onset of the PEP-IPI in the same school of twenty percent of the staff. Another subjective impression of teacher satisfaction was the effort and organization of

the staff at duplicating as much of the PEP-IPI treatment as possible without special funding or administrative direction. Finally, and perhaps most significantly, parent approval of the project and parent change as a result of the project was evidenced from two observations. Parent attendance at school-community functions increased dramatically and successful organization of Follow Through parent groups became a reality.

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