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AUTHOR KARNES, MERLE B.; AND OTHERS  
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## ABSTRACT

THIS 3-YEAR STUDY MADE A LONGITUDINAL COMPARISON OF THREE TYPES OF PRESCHOOL INTERVENTION PROGRAMS. THE TRADITIONAL APPROACH (TWO CLASSES OF 15 STUDENTS AND THREE TEACHERS EACH) WORKED IN CONVENTIONAL WAYS TO IMPROVE PERSONAL, SOCIAL, MOTOR AND GENERAL LANGUAGE DEVELOPMENT; CHILDREN WERE PLACED IN A REGULAR PUBLIC SCHOOL KINDERGARTEN THE FOLLOWING YEAR. THE AMELIORATIVE APPROACH (TWO CLASSES OF 15 STUDENTS AND THREE TEACHERS EACH) EMPHASIZED LANGUAGE DEVELOPMENT THROUGH SMALL GROUP LESSONS USING VERBALIZATIONS AND CONCRETE MANIPULATION. THE NEXT YEAR CHILDREN ENTERED REGULAR KINDERGARTEN BUT CONTINUED ADDITIONAL 1-HOUR-A-DAY SUPPORTIVE WORK. THE DIRECT VERBAL APPROACH (ONE CLASS) UTILIZED INTENSIVE ORAL DRILL IN VERBAL AND LOGICAL PATTERNS AND MINIMIZED VISUAL AND MANIPULATIVE MATERIALS, CONTINUING THIS APPROACH THE FOLLOWING YEAR. DURING THE PRESCHOOL YEAR, CHILDREN IN THE AMELIORATIVE AND DIRECT VERBAL APPROACHES BOTH MADE MORE PROGRESS THAN THE TRADITIONAL GROUP. DURING THE KINDERGARTEN YEAR, ONLY THE DIRECT VERBAL APPROACH SHOWED CONTINUED PROGRESS. AT THE END OF THE THIRD YEAR, THE LOSSES EXPERIENCED BY THE DIRECT VERBAL AND AMELIORATIVE GROUPS RESULTED IN NONDIFFERENTIATED PERFORMANCE IN INTELLECTUAL AND LANGUAGE FUNCTIONING AMONG THE THREE GROUPS. AMELIORATIVE AND DIRECT VERBAL GROUPS WERE SUPERIOR TO THE TRADITIONAL IN SCHOOL ACHIEVEMENT. (MH)

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**A Longitudinal Study of Disadvantaged Children  
Who Participated in Three Different  
Preschool Programs**

Merle B. Karnes  
James A. Teska  
Audrey S. Hodgins<sup>1</sup>

In the broad social concern with the poor and disadvantaged of our population which has characterized the 1960s, no program has appeared more hopeful than preschool education. Here, if anywhere, it seemed, was the point at which the cycle of deprivation might be broken, the predictable sequence of academic failure and early drop-out interrupted. The assumption that preschool experience would allow disadvantaged children to compete more favorably in the formal school setting was embodied in federal social policy through the support of Headstart without any real agreement, however, about the specific educational approach most appropriate for this purpose.

This study, then, addresses itself to a longitudinal evaluation of the effectiveness of three preschool interventions in preparing disadvantaged children to function successfully in school. The first intervention was intended to embody the traditionalist point of view: a nursery school experience which worked in conventional ways to improve the personal, social, motor, and general language development of the children followed by a traditional kindergarten under the auspices of the public school. The second approach radically departed from the established point of view: the traditional preschool and the traditional kindergarten were seen as inadequate and inappropriate to the task of insuring the academic competence of the

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<sup>1</sup>Merle B. Karnes is Project Director and Professor of Special Education; James A. Teska is Research Associate; and Audrey S. Hodgins is Senior Educational Specialist, Institute for Research on Exceptional Children, College of Education, University of Illinois, Urbana, Illinois. This research was supported by funds from the US Office of Education, Bureau of Research, Grant 5-1181, Contract OE 6-10-235.

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disadvantaged child, and an experimental preschool and an experimental kindergarten were provided. The third approach represented a middle ground: amelioration of deficits related to school inadequacies must begin during the preschool year so that the disadvantaged child may benefit fully from the traditional kindergarten, and a special preschool program was provided. The traditional kindergarten, it was assumed, would then be an appropriate prelude to first grade, and only a one-hour supportive program was offered these children the second year.

## METHODOLOGY

### Selection of Subjects

The subjects for this study were selected from the preschool population of the economically depressed neighborhoods of Champaign-Urbana, a community of 100,000 in central Illinois. The 1960 Stanford-Binet Intelligence Scale was administered to eligible children who were then stratified on the basis of their intelligence quotients into three groups (IQ scores 100 and above, 90 through 99, and 70 through 89) and assigned to class units (N=15) in which one-third of each class consisted of children who had scored in the "high" IQ range; one-third, the "middle" range, and one-third, the "low" range. Stratification provided an opportunity to evaluate the effectiveness of the various programs with different ability groups. The mean IQ (approximately 95) of the children placed in these classes was, of course, higher than the mean of children screened.

Class units were examined to assure comparability of sex and race, an approximate ratio of 67% Negro and 33% Caucasian children and a ratio of approximately 50% male and 50% female children. Finally, each class unit was randomly assigned to one of the three intervention programs. During the first year of the study 75 disadvantaged children, five class units of



15 children each, participated. Two class units were assigned to the Traditional program, two to the Ameliorative program<sup>2</sup>, and one class unit to the Direct Verbal program. The initial composition of the groups is summarized in Table 1.

#### Evaluation Procedures

Evaluations were made prior to the preschool intervention, at the end of the first and second years of intervention, and at the end of first grade in the following areas:

1. Intellectual functioning as measured by the 1960 Stanford-Binet Individual Intelligence Test, Form L-M.
2. Language development as measured by the Illinois Test of Psycholinguistic Abilities, experimental edition, 1961.
3. Visual perception as measured by the Frostig Developmental Test of Visual Perception.

In addition, the Metropolitan Readiness Tests were administered at the end of the preschool and kindergarten years and the California Achievement Tests, at the end of the first grade.

#### The Three Programs of Classroom Intervention

Since the effects of specific classroom interventions were the concern of this study, total impact programs were not considered and variables outside the classroom which may significantly alter the development of the child were not manipulated. All children were bussed to school and attended daily sessions of two hours and fifteen minutes for approximately seven months. Three teachers were employed for each class unit of 15 children.

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<sup>2</sup> A comparative evaluation of these two interventions appears in Karnes, M. B. et al, "An Evaluation of Two Preschool Programs for Disadvantaged Children: A Traditional and a Highly Structured Experimental Preschool," Exceptional Children, 1968, 34, 667-676.

Table 1  
Initial Group Composition

Group	N*	Binet CA	Binet IQ	Intelligence Strata Means			Race		Sex	
				High N	Middle N	Low N	Cauc.	Negro.	M	F
Traditional	25	52.4	94.4	108.6	93.9	82.6	9	16	15	10
Ameliorative	24	52.1	96.2	107.0	95.7	84.6	7	17	11	13
Direct Verbal	10	51.1	96.6	111.0	93.5	86.3	3	7	4	6

\*Sixteen children withdrew from the programs before the end of the third year (battery four), and no data for these children are included in this study.

The three programs of classroom intervention may be distinguished as follows:

1. Major goals of the Traditional preschool were to promote the personal, social, motor, and general language development of the children. Teachers were instructed to capitalize on opportunities for incidental and informal learning, to encourage the children to talk and to ask questions, and to stimulate their interest in the world around them. Music, story, and art activities were scheduled regularly, and special efforts were made to interest the children in books. Indoor and outdoor play were part of the daily routine.

During the second year of the study the children who had attended the Traditional preschool were enrolled in kindergarten solely under the supervision of the public school.

2. In the Ameliorative preschool language development was considered to be the critical deficit area for disadvantaged children. Each class unit (N=15) was divided into three groups on the basis of Binet IQ with one teacher for each group. The daily schedule focused on three 20-minute learning periods: mathematics concepts, language development and reading readiness, and science-social studies. A large room where the 15 children could gather for group activities was available; however, most of the instruction took place in relatively small cubicles off the main room. Each cubicle contained materials appropriate to one of the three content areas, and each teacher moved from one cubicle to another with her group of five children. Teachers accommodated their teaching strategy to the performance of the children on battery one tests and incorporated into their lesson plans the various facets of the language process embodied in the Illinois Test of Psycholinguistic Abilities.

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Language development received major emphasis throughout the day and especially during the three structured periods. Verbalizations in conjunction with the manipulation of concrete materials were considered to be the most effective means of establishing new language responses. A game format (card packs, lotto games, models and miniatures, sorting, matching, and classifying games) created situations where verbal responses could be made repeatedly in a productive, meaningful context without resorting to rote repetition; often the child could visually and motorically assess the correctness of his thinking before he made an appropriate verbalization. If the child was unable to make a verbal response, the teacher supplied an appropriate model; when he began to initiate such responses, the teacher had opportunity to correct, modify, and expand his verbalizations.

During the second year of the study the children who had attended the Ameliorative preschool attended public kindergartens in the morning and participated in an additional one-hour supportive program at the research center in the afternoon. This session was divided into two periods--language development/reading readiness and mathematics concepts. This schedule was broken for an occasional field trip or art project, but art, music, and indoor-outdoor play generally were not scheduled. An effort was made to avoid repeating activities which had already been provided in the morning public kindergarten and to emphasize activities directly related to first grade academic success. Because the performance of the Ameliorative group on all ITPA subtests had been essentially nondeficit at the time of the post-preschool evaluation, the major emphasis in the supportive kindergarten program was shifted from language development toward academic achievement.



3. Basic to the Direct Verbal program<sup>3</sup> conducted by Carl Bereiter and Siegfried Engelmann was the assumption that disadvantaged children are adequate in perceptual and motoric skills but inadequate in verbal and abstract skills and, therefore, the appropriate mode for instruction is intensive oral drill in verbal and logical patterns. A deliberate effort was made to minimize the use of visual and manipulative materials. The specific curriculum was developed from a study of task requirements.

The children were divided into three groups of approximately five each, initially on the basis of Stanford-Binet IQ scores but later on the basis of teacher evaluation of the children's ability to learn, retain, and process what was taught. The daily schedule centered around three learning periods: language, arithmetic, and reading.

The general instructional strategy in the three subjects was that of rule followed by application. A verbal formula was learned by rote and then applied to a series of analogous examples of increasing difficulty. Tasks were initially presented in a highly structured form that provided a maximum of syntactical and presentational prompts; then the tasks were systematically "destructured" to remove these prompts and admit the variations in presentation that would be encountered in normal situations.

The language program focused on minimum essentials of language competence. Its objective was a kind of basic English that teacher and child may use in the conduct of elementary education--a basic English which did not embody all the concepts a child should master but provided a medium through which those concepts may be learned. The arithmetic program emphasized a "science of counting" without reference to phenomena that

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<sup>3</sup>The description of the Direct Verbal program and appropriate portions of the discussion were written in conjunction with Mrs. Jean Osborn who has been with the program since its inception.



can be interpreted arithmetically since it was assumed that the disadvantaged child lacks the verbal and logical sophistication necessary to abstract arithmetic principles from everyday experiences. After the initial teaching of counting, arithmetic was taught through equations, emphasizing the idea that any equation could be read as a statement of fact and also as an instruction that told how the fact could be established through a counting operation. The children were taught to read according to a modified Initial Teaching Alphabet. As early as possible, the children were introduced to controlled-vocabulary stories written by the reading staff.

According to the research design, children who had attended the Direct Verbal preschool were not to attend public kindergarten and were to return to the research center the second year for a continuing half-day program. At parental insistence or teacher suggestion, however, three of the ten children attended public kindergarten in the morning and the Direct Verbal program in the afternoon.

The Direct Verbal program in the second year was an extension of the first year's curriculum, and the children followed the schedule of the previous year, with variations to allow for the nature of more advanced work. The children were grouped by ability for twenty-five minute instructional periods in language, reading, and arithmetic. The language program included concepts of measure, the formal use of function words, and the vocabulary engendered by a study of the part-whole relationship of over 100 objects. A series of stories was developed to acquaint children with concepts not easily demonstrated in the classroom. The reading method developed at the project for the second year was arranged into a highly systemized program which emphasized necessary reading subskills that disadvantaged children typically do not possess. In arithmetic the children received further work in the curriculum initiated the first year and no

significant alterations were made. They continued to use numbers and symbols to work basic arithmetic problems, learned to solve story problems, and were taught algebraic problems.

During the third year of the study children from all intervention programs attended racially integrated first grade classes under the sole supervision of the public school. No further research intervention was provided, and all children were given the fourth battery of tests in the late spring.

## RESULTS AND DISCUSSION<sup>4</sup>

### Intellectual Functioning

The Binet performances of the three groups were clearly differentiated over the three year period (Table 2, Figure 1). The performance of the Ameliorative and Direct Verbal groups was significantly superior to that of the Traditional group at the end of the preschool year. Initially the IQ scores of one-third of the children in each group placed them in the high stratum, 100 and above. On test two, 92% of the children in the Ameliorative group and 90% of the children in the Direct Verbal group fell in this stratum while only 48% of the children in the Traditional group earned such scores. Approximately 80% of the children in the Direct Verbal group and 71% of the children in the Ameliorative group made gains of ten or more points. Only 40% of the children in the Traditional group made gains of that magnitude. No child in the Direct Verbal or Ameliorative groups failed to make a gain; 20% of the children in the Traditional group scored lower on test two than on test one.

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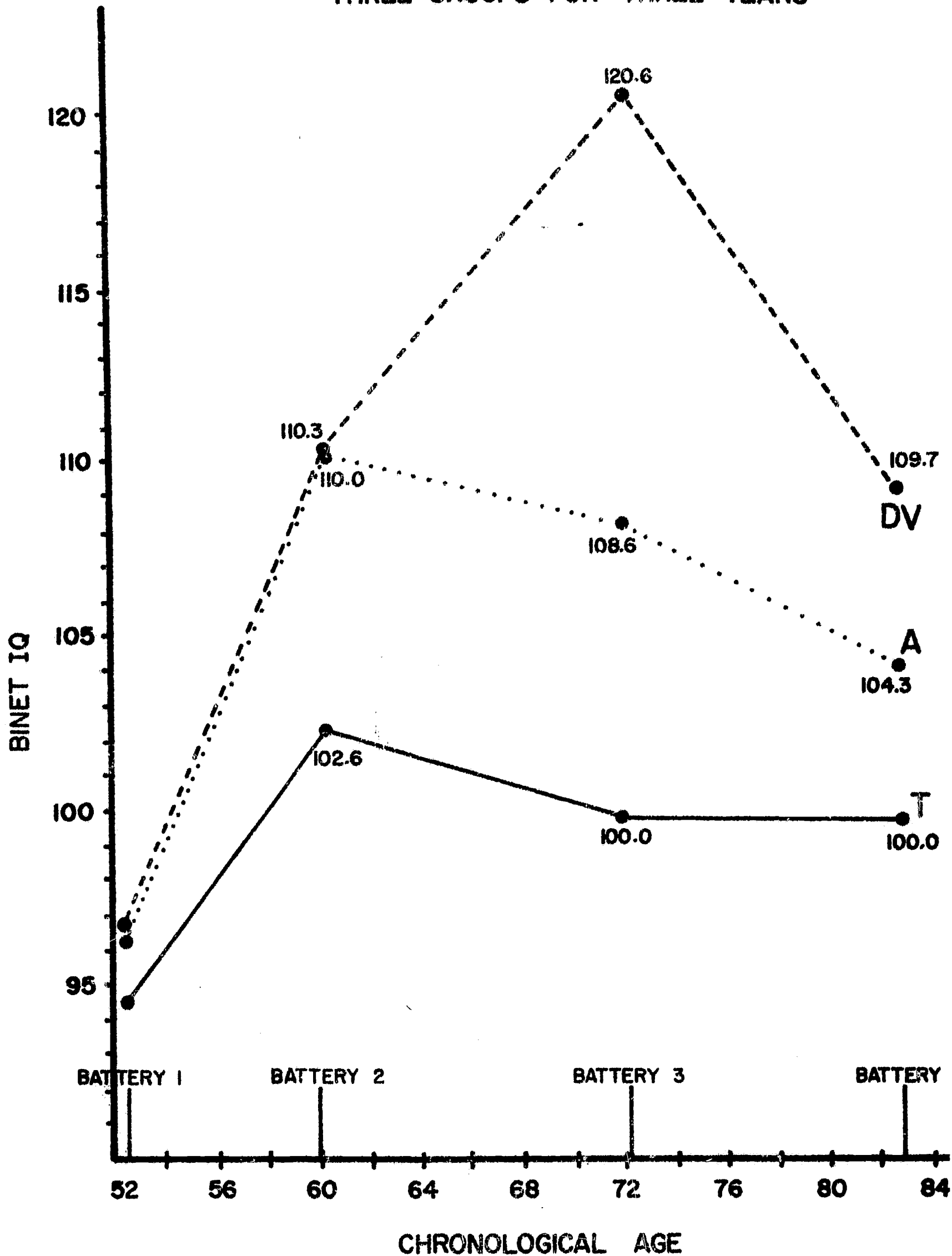
<sup>4</sup>The statistical analysis consisted of a series of multivariate analyses of covariance on the total battery and on ITPA subtests followed by Newman-Keuls tests when appropriate. These data are not presented in this paper, but significant differences are reported in the following discussion.

Table 2  
Binet IQ

Group	N	Test				Test Four
		Test One	Test Two	Test Three	Test Four	
		Preschool Year	Kindergarten Year	First Grade		
Traditional	25	94.4	102.6	100.0	100.0	100.0
Ameliorative	24	96.2	110.0	108.6	104.3	104.3
Direct Verbal	10	96.6	110.3	120.6	109.7	109.7



FIGURE I  
BINET IQ  
THREE GROUPS FOR THREE YEARS



NOTE: THE TIMES OF THE FOUR BATTERIES ARE PLOTTED AT THE MEAN BINET CHRONOLOGICAL AGE OF THE THREE GROUPS,

The magnitude and consistency of IQ gains within intervention groups reflect one of the most important findings of the first year of the study: the Ameliorative and Direct Verbal preschools had a positive effect on the IQ score of every child in attendance, and one must conclude that these two programs provided unique opportunities for enhancing the level of intellectual functioning with remarkable consistency. Both programs were predicated upon the active involvement of teacher and child in immediate verbal interactions. In the Ameliorative program, the teacher monitored the child's manipulative performances and assessed the adequacy of his verbal responses so that she could alter the learning situation appropriately. It was the function of the teacher to provide situations which required sufficient repetition to establish new verbal responses and to alter the learning task to encompass further cognitive and verbal complexities. The child moved from structured, physical involvement within a meaningful, productive context to independent verbalizations. In the Direct Verbal program similar results were achieved through intensive verbal and logical oral pattern drill which culminated in highly specific early reading and mathematics curricula. In the Traditional program a variety of learning experiences were made available to the children, but their involvement in specific activities was often not required. Although verbal responses were encouraged, they were not insisted upon. Individual children in this program did indeed make gains comparable to those made in the other two programs, but the number of children who made excellent gains in the Traditional preschool is overshadowed by the percentage who made minimal gains or regressions.

At the end of the kindergarten year, the Binet performance of the Direct Verbal group was significantly superior to that of the other two groups. Only the children in the Direct Verbal group made an additional

gain the second year, a substantial addition of 10 points for a total two year gain of 24 points. The other two groups remained relatively unchanged, showing losses less than three points. Although the one-hour Ameliorative supportive program was unsuccessful in fostering further gains, it may have been responsible for maintaining the relatively large first year gain of this group. Since the first year gain of the Ameliorative group was substantially larger than that of the Traditional group, a sizeable regression might have occurred had these children attended public kindergarten only.

The continuing gain demonstrated by the Direct Verbal group is a clear endorsement for sustained special programming for disadvantaged children.

At the end of the third year of the study, when all children were completing the first grade there were no significant differences among the three groups. The magnitude of the loss (11 points) of the Direct Verbal group was the major factor in this leveling effect; however, the Ameliorative group lost an additional four points (a 6 point loss over the two year period). The mean IQ of the Traditional group remained unchanged during the third year.

The distribution of IQ gains by strata over the three year period (Table 3) offers some of the most encouraging data of the study as well as some of the most disturbing. The high loss (13 points) of the middle and low strata children in the Direct Verbal group during the first grade in the public schools was not shared by children in these strata in either the Traditional or the Ameliorative groups. The low strata children of the Ameliorative group, in fact, maintained their sizeable initial gain (15 points) with remarkable consistency. Because the gains of the Ameliorative children in the low and middle strata were both substantial and stable, it seems justifiable to conclude that this program offered particular opportunities to develop the intellectual functioning of low normal and slow learning



Table 3  
 Binet IQ Gains  
 By Intervention by Strata

Group	Strata	N	Post-Preschool Test 1-2 diff.	Post-Kindergarten Test 1-3 diff.	Post-First Grade Test 1-4 diff.
Traditional	High	7	6.3	4.1	1.4
	Middle	10	8.9	5.1	10.1
	Low	8	9.0	7.4	6.3
Ameliorative	High	8	9.9	10.8	.5
	Middle	9	15.7	12.0	10.7
	Low	7	16.0	14.7	14.7
Direct Verbal	High	3	11.3	21.7	15.3
	Middle	4	14.0	20.8	7.0
	Low	3	15.7	30.7	19.0

children. The Ameliorative preschool program stressed physical mastery of a concept through manipulative experience accompanied by appropriate verbalizations--a mode of instruction apparently suited to the children in these strata. The academic readiness work offered in the supportive program the second year not only maintained the gains in intellectual functioning made during the preschool year but seemed to provide the necessary thrust to sustain this level of performance again the third year when these children were in the first grade with no special programming. Since the early amelioration of school inadequacies was the intent and design of the Ameliorative program, the magnitude and stability of these IQ gains is an endorsement of the effectiveness of this program. The drastic reversal in Binet performance experienced by the children in the lower two strata of the Direct Verbal group suggests difficulty in making a transition from intensive pupil-teacher interaction to large group instruction. Children in the Traditional group had never experienced such a high degree of teacher-pupil interaction. Although children in the Ameliorative group had been actively engaged in small group, teacher-directed instruction during their preschool year, the supportive program the second year (low pupil-teacher ratio) ran simultaneously with the public kindergarten (large group instruction) and may have provided a useful transition to the first grade setting. It is, of course, also possible that the mode of instruction in the Direct Verbal program, so highly effective during the first two years of the study, was inappropriate to the public school setting. The dissonance between the specific child behavior required in the Direct Verbal program and the operation of the first grade classroom may have been so great as to inhibit continuing intellectual development.

The IQ losses experienced only by the high strata children in both the Traditional and Ameliorative groups during first grade are of real concern and resulted in an IQ change in a negative direction over the three year period. The modest gain (six points) of the Traditional high strata and the more substantial gain (ten points) of the Ameliorative high strata during the preschool year remained constant during the kindergarten year but were lost during the first grade. It is untenable to presume that there was a factor common to both the Traditional and Ameliorative two-year interventions which could explain such losses the third year. Rather, it seems reasonable to suppose that in important ways the public school failed these high strata children during the first grade. These children may have been judged by criteria based on preconceptions of what disadvantaged children are like and how they will perform in school, and instructional provisions may have been more inadequate for the high strata children with their demonstrated potential than for the children in the other two strata.

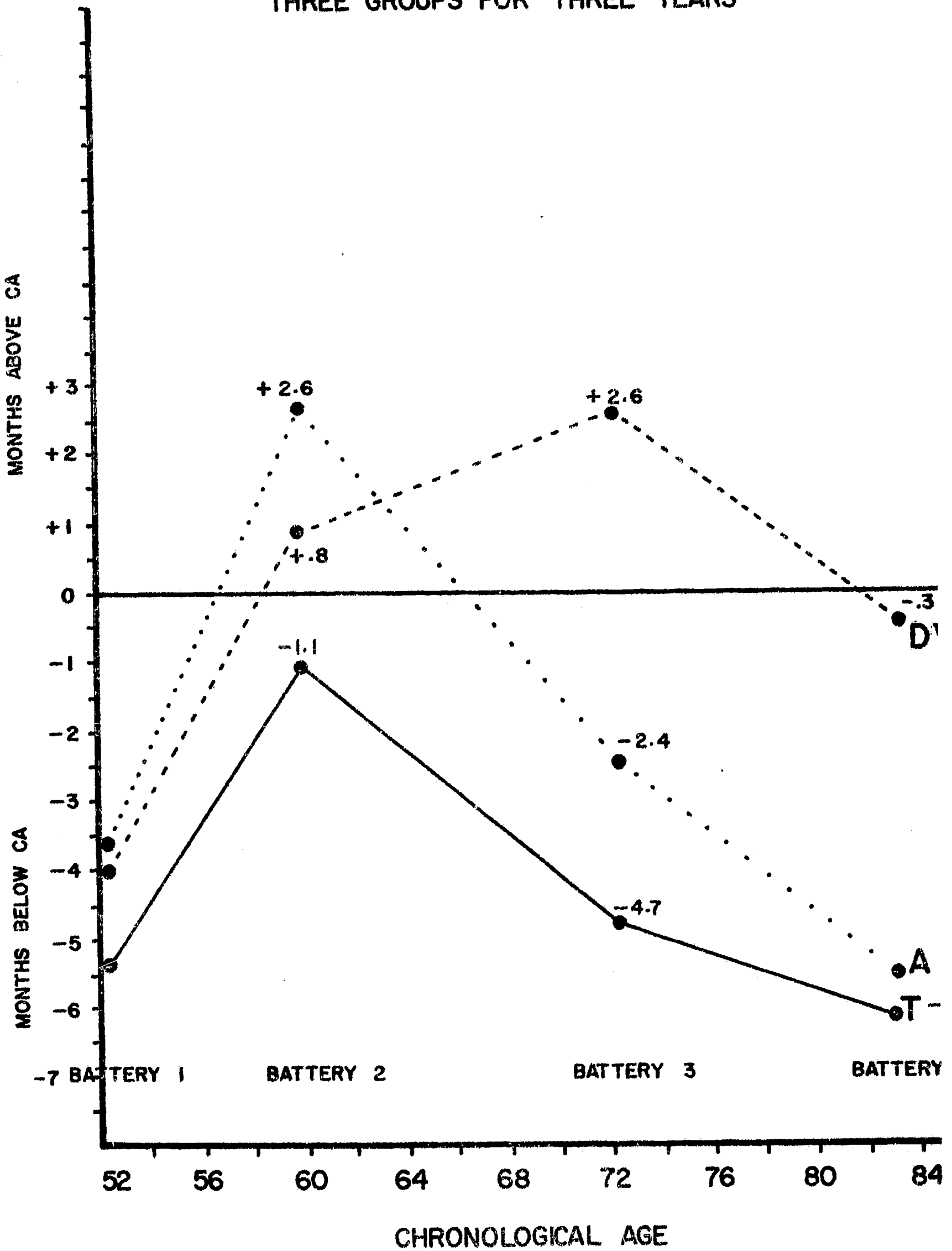
#### Language Development

The performance over three years of the three groups on the ITPA essentially paralleled Binet performance (Figure 2). Only at the end of the second year, however, did the differential nature of the language performance reach statistical significance. To relate ITPA language age to chronological age a difference score (in months) was computed by subtracting a child's chronological age at the time of testing from his language age score. Initial group means deficits on ITPA total language age were four to five months. At the end of the preschool year the three groups were performing very nearly at their respective chronological ages. The Traditional group maintained a small deficit, and the Direct Verbal group achieved a modest acceleration. The Ameliorative group made the largest gain and



FIGURE 2

ITPA TOTAL LANGUAGE AGE DIFFERENCE SCORES  
THREE GROUPS FOR THREE YEARS



NOTE : THE TIMES OF THE FOUR BATTERIES ARE PLOTTED AT THE MEAN BINET  
CHRONOLOGICAL AGE OF THE THREE GROUPS.

was functioning nearly three months above its mean chronological age. Only the Ameliorative group achieved a nondeficit performance on all ITPA subtests the first year.

During the second year of the study only the Direct Verbal group made continued gains, and its ITPA total performance was significantly higher than those of the Ameliorative and the Traditional groups. Over the two year period the Direct Verbal group consistently made substantial gains and achieved a nondeficit test three performance on all ITPA subtests. The losses of the Ameliorative group during the kindergarten year resulted in a test three performance over two months below chronological age while the losses of the Traditional group resulted in a test three deficit which very nearly equaled its initial deficit. Clearly the direction of the Ameliorative supportive curriculum, in spite of the nondeficit performance of this group at the end of the preschool year, had moved prematurely from language development toward academic achievement. The inadequacy of traditional kindergarten programming for developing language of disadvantaged children is reflected in the losses of the Ameliorative group and even more sharply in the losses of the Traditional group. The continued progress of the Direct Verbal group clearly supports sustained special programming during the kindergarten year.

There were no statistical differences among the ITPA total performances of the three groups at the end of the third year of the study. All groups regressed during the first grade year. The extent of the losses of the Traditional and Ameliorative groups during the kindergarten and first grade years exceeded the gains they had made in the preschool year. Although the Direct Verbal group was performing at its chronological age, the loss experienced by this group during the first grade exceeded their gain of

the kindergarten year and does not support an encouraging language prognosis. The longitudinal data suggest that no intervention program was entirely successful in providing the necessary impetus to maintain an adequate level of language functioning in the first grade of the public schools.

### Visual Perception

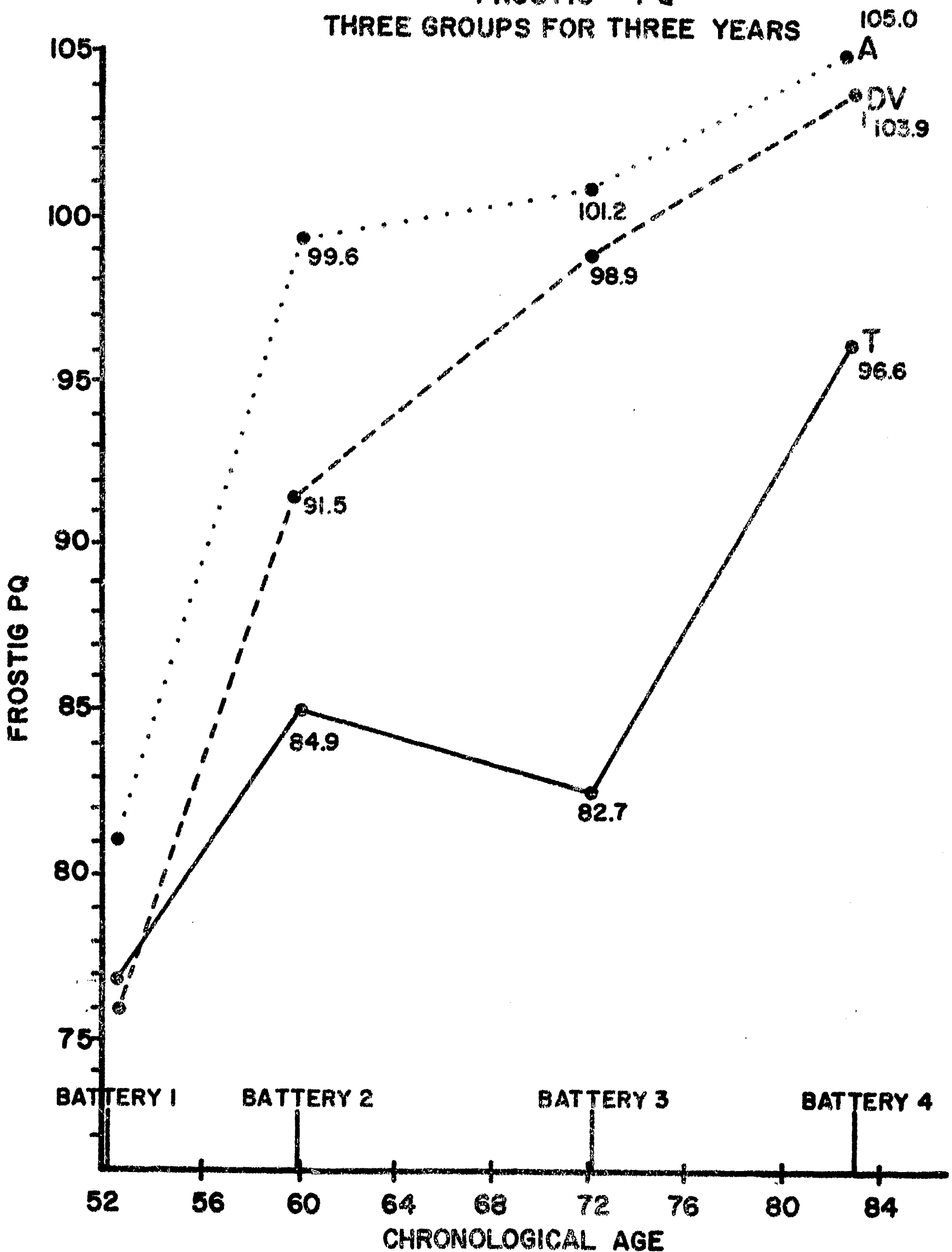
The performances over the three year period on the Frostig Developmental Test of Visual Perception were substantially different for the three groups (Figure 3). At the end of the preschool year, the performance of the Ameliorative group was significantly higher than that of the Traditional group only. Frostig suggests that children whose scores fall in the lowest quartile will experience difficulty in school adjustment and recommends remedial training for these children. At the end of the first year, 76% of the children in the Traditional group, 30% of the children in the Direct Verbal group, and 21% of the children in the Ameliorative group obtained such scores. The superior performance of the Ameliorative group may be attributed to those aspects of the curriculum designed to develop visual perceptual skills: the recognition of geometric shapes; cutting dot-to-dot, matching, and pasting exercises; and pencil/crayon work in general.

During the kindergarten year, the Ameliorative and Direct Verbal groups made continuing progress and were significantly higher than the Traditional group which regressed slightly.

All groups made progress during the first grade year; however, the Traditional group made a substantial gain and there were no longer significant differences among the groups. Only 8% of the children in the Ameliorative group now scored in the lowest quartile while 20% of the Direct Verbal children and 44% of the Traditional children earned such scores. Children who participated in the Traditional program did indeed make gains in this



FIGURE 3  
FROSTIG PQ  
THREE GROUPS FOR THREE YEARS



NOTE: THE TIMES OF THE FOUR BATTERIES ARE PLOTTED AT THE MEAN BINET CHRONOLOGICAL AGE OF THE THREE GROUPS

area in the first grade; however, the groups who participated in the structured academically-oriented programs had a considerably smaller percentage of children who might be considered prone to reading failure, to the extent that reading failures are related to visual perceptual inadequacies.

### School Readiness

Since normative data for the Metropolitan Readiness Tests are not available for preschool children, the data obtained at the end of the kindergarten year (battery 3) provide a more appropriate base for discussion. The post-kindergarten performances of the Ameliorative and Direct Verbal groups were significantly higher in both reading and number readiness than those of the Traditional group (Table 4).

A superior reading readiness status was achieved by 38% of the children in the Ameliorative program, and 67% of the children in this group were rated high normal and above. No child in the other two programs earned a superior rating, while 40% of the children in the Direct Verbal group and 28% of those in the Traditional group were in the high normal range. A major intent of the Ameliorative supportive program had been preparation for formal reading instruction, and this focus developed reading readiness skills as measured by the Metropolitan. The failure of the Direct Verbal group to achieve a performance superior to that of the Ameliorative group is puzzling since the Direct Verbal curriculum included an intensive two-year reading program.

The superior performance of the Ameliorative and Direct Verbal groups in number readiness at the end of the kindergarten year reflects their highly specific mathematics curricula. Disadvantaged children of preschool and kindergarten age apparently profit from academically-oriented instruction in mathematics, and both programs seemed appropriate and effective with these children.

**Table 4**  
**Metropolitan Readiness Tests Raw Scores**

Group	N	Reading Readiness		Number Readiness	
		Post-Preschool Battery 2	Post-Kindergarten Battery 3	Post-Preschool Battery 2	Post-Kindergarten Battery 3
Traditional	25	36.6	48.4	5.9	12.8
Ameliorative	24	40.6	56.5	10.8	21.0
Direct Verbal	10	35.3	53.9	11.5	20.5



### First Grade Achievement

The academic achievement of the Ameliorative and Direct Verbal groups as measured by the California Achievement Tests was significantly higher in all areas than that of the Traditional group (Table 5). The very similar performances of the Direct Verbal and Ameliorative groups in reading is of particular interest since these programs relied on rather different approaches to reading during the first two years of the study. Two years of reading instruction in the Direct Verbal program prior to the first grade seem to have been only as effective as the extensive readiness preparation in the Ameliorative program in producing accelerated reading development. This study provides little evidence to support the introduction of early reading programs for disadvantaged children.

The mean reading level of the Traditional group was essentially at grade level, an encouraging result for a group of disadvantaged children of normal ability. The distribution of reading scores within this group (Table 6), however, is disconcerting since nearly half of these children demonstrated limited reading ability, scoring below a 1.5 grade level. The mean reading level of the Ameliorative and Direct Verbal groups, nearly a half year above grade level, is indeed a remarkable achievement for these disadvantaged children. Further, in these two groups very few children seemed to be having marked difficulty in learning to read; in fact, over half of these children were reading at or above the second grade level.

Since such divergent approaches to reading yielded nearly identical results, elements common to these two programs and absent in the Traditional program are of some interest. Both the Ameliorative and Direct Verbal programs gave major emphasis to language development through intensive, highly structured programming. Learning tasks were explicitly designed to achieve

Table 5

California Achievement Tests  
at the End of First Grade

Group	N	Average Grade Placement	Grade Norms		
			Reading	Arithmetic	Language
Traditional	25	1.74	1.67	1.49	1.70
Ameliorative	24	1.74	2.12	1.80	2.09
Direct Verbal	10	1.72	2.17	1.80	2.00

Table 6

California Achievement Tests  
Distribution of Reading Scores  
at the End of First Grade

Group	N	Grade Norms			
		Below Average 1.0-1.4	Average 1.5-1.9	Above Average 2.0-2.4	Superior 2.5-3.4
Traditional	25	48%	28%	8%	16%
Ameliorative	24	8%	42%	21%	29%
Direct Verbal	10	10%	20%	50%	20%

NOTE: These distribution categories were constructed on the basis of the average grade placement of the children (1.7).

immediate goals, and the child's participation in specific, repeated verbal responses was required in direct teacher-child interactions.

#### SUMMARY

During the preschool year, children in the Ameliorative and Direct Verbal groups made similar progress which was generally superior to that of the Traditional group. A slight advantage fell to the Ameliorative group in language development. During the kindergarten year, the Ameliorative and Traditional groups regressed substantially in critical areas. The one-hour Ameliorative supportive program may be credited with achieving a performance superior to that of the Traditional group and equal to that of the Direct Verbal group only in school readiness and visual perception. The Direct Verbal group, which attended a continued special program during the kindergarten year, made consistent progress in all areas, achieving a generally superior performance. At the end of the third year of the study, the magnitude of the losses experienced by the Direct Verbal group essentially resulted in nondifferential performances among the three groups in intellectual and language functioning. Significantly different performances occurred only in school achievement where the Ameliorative and Direct Verbal groups were superior to the Traditional group.

In spite of the disappointments of some of the longitudinal data, a major accomplishment of this study remains: serious learning deficits of the disadvantaged children in the Ameliorative and Direct Verbal groups were eliminated during the preschool year. In the Direct Verbal program, where extensive special programming was sustained over a two year period, continued growth occurred. These achievements are a legitimate basis for assuming that these structured academically-oriented preschools are an appropriate and effective intervention. The deterioration in language



and intellectual functioning which occurred at the termination of intensive programming demonstrates the need for continued intervention characterized by low pupil-teacher ratios which make possible the interaction necessary for language development and provide the opportunity to design and implement tasks which will achieve specific goals.