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This preschool program concentrated on language development, self-concept, perception, and concept formation. Also, a vertically organized program of reading, math, science, and creative dramatics, along with parent activity, inservice training, and dissemination, covered prekindergarten through the third grade. Individual and small group work allowed children to proceed at their own rate. The subjects, mostly Negroes from nonintact lower class families, originally varied in number from 120 to 200 (including controls) in each of six groups (waves) studies. Pretests were administered before prekindergarten. Two posttests were given, one after prekindergarten and the other after kindergarten. Evaluation was hampered by a loss of subjects, by an arrangement in which only subsamples were tested, and by the use of various tests. The results on the Columbia Mental Maturity Scale showed that for the subsamples drawn from the first experimental wave and the basic control group, the difference in the means were not statistically significant on pretests, yet they were significant on the first posttest but not on the second posttest. For subsamples drawn from waves two through four, results on the Stanford-Binet showed that the experimental groups performed significantly better on both posttests but not on pretests. (JS)

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EARLY CHILDHOOD PROJECT
New York City

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IT WORKS

EARLY CHILDHOOD PROJECT
NEW YORK CITY

One of a Series of

Successful Compensatory Education Programs

U.S. Department of Health, Education, and Welfare
Robert H. Finch, Secretary

Office of Education
Peter P. Muirhead, Acting Commissioner

FOREWORD

This project report is part of an independent study of selected exemplary programs for the education of disadvantaged children completed under contract to the U.S. Office of Education by the American Institutes for Research in the Behavioral Sciences, Stanford University. The researchers report this project significantly improved the educational attainment of the disadvantaged children involved. Other communities, in reviewing the educational needs of the disadvantaged youngsters they serve, may wish to use this project as a model - adapting it to their specific requirements and resources.

Division of Compensatory Education
Bureau of Elementary and Secondary Education

THE EARLY CHILDHOOD PROJECT OF THE INSTITUTE FOR DEVELOPMENTAL STUDIES IN NEW YORK CITY

Introduction

The program was begun at preschool level and concentrated on basic skills, particularly those related to development of language and concept formation. In additon, a vertically-organized program of reading, maths, and science covered prekindergarten through third-grade. Steps were small and much practice was provided by specially prepared games. Individual and small-group work was used to allow each child to proceed at his own rate.

The children were almost all Negro and came from an area of Harlem typified by non-intact families living in tenements or crowded high-rise projects. They were selected on the basis of low occupational and educational status of the parents.

The program traces its beginnings to 1958, when Dr. Martin Deutsch and the Institute for Developmental Studies began studies of the intellectual development of disadvantaged children. In 1962, the Institute began to translate its findings into action in the form of a demonstration enrichment program for preschoolers. In 1964, the program was expanded so as to extend from preschool through grade three; by 1967-68 it included 17 classes in four public schools.

No overall trends are yet discernible for all waves. Results from the Stanford-Binet showed that experimental groups in Waves 1-4 made gains in IQ during the first 2 enrichment years, which were maintained subsequently. Control groups were equivalent to the experimentals on the pretest, but were significantly poorer on posttests.

Personnel

A considerable number of persons were involved in this project. However, many of them engaged principally in research or development of materials. Hence, this listing includes only teachers and others who directly actuate the program of instruction and related services.

A. Curriculum Director.

She was responsible for coordinating the work of curriculum staff and for supervising the research of the curriculum supervisors.

B. Curriculum Supervisor. (One in each of the four schools.)

She coordinated inservice training of the project teachers and assistant teachers in one school. She frequently observed the classroom, and provided demonstrations of desirable teaching behavior

when needed. The curriculum supervisor maintained each teacher's focus on: individualization of instruction; encouragement of independent learning activities for children; implementation of changes in program. She met weekly with the other supervisors.

C. Teachers. (One in each of 17 classes.)

Besides teaching, each trained and guided an assistant teacher and prepared materials. The training of assistants was thought to be complete when assistants could manage classes on their own.

D. Assistant Teachers. (One per class. Bachelor's degree, not certificated.)

She assisted with classroom instruction, assuming primary responsibility for instructing some individuals or small groups. She checked completed work. She also assumed responsibility for one or two more items of instruction and their schedules of use.

E. Community Aides. (Three in number.)

Each knew all the parents in her area, through home visits; she informed parents of meetings and community resources (e.g., neighborhood councils, new housing projects), manned the Parent Center and helped parents expedite problems which interfered with school.

F. Social Worker.

She worked with parents and teachers toward solution of behavior problems of certain children, and helped parents to get assistance when they had problems, such as marital discord. She also worked in Parent Center. She was also in charge of supervision and training of community aides.

Additionally, several subject-matter specialists developed materials and curriculum plans (some commercially available or otherwise in print), for the training of parents in their use.

A Negro college student was hired to serve in a big-brother capacity outside of the classroom to four boys presenting behavior problems; the results of this venture were considered satisfactory.

Methodology: General

This program evolved through a decade of research and development by a staff of psychologists and teachers. Many other

programs have been influenced by it. Considerable resources were available. The rationale and methods have been described with particular care, and thus a good deal of excerpting is appropriate here. This report can present only a sketchy summary of the extensive information available in the original source (New York University, 1967).

> For the children of the poor, whose lives are often lacking in richness and diversity, the traditional school can be an alien, frightening, hostile world, difficult to understand and filled with failure.
>
> Traditional curricula have been planned on the assumption that the child has already acquired certain cognitive and language skills which he can apply to new situations and on which the school can build at more complex levels. The disadvantaged child has had little chance to acquire such skills.
>
> In Institute classes, therefore, from prekindergarten through grade three, the consistent curriculum emphasis is on the cognitive areas of language, perception, concept-formation, and self-image. These are the areas in which the disadvantaged child has been least stimulated by his early environment and which are most operative in successful school learning.
>
> When the prekindergarten and kindergarten classes were originally established, it was our hypothesis that early intervention would adequately prepare disadvantaged youngsters for success in any regular school program. As our work has progressed, we have come to believe that although early intervention is of primary significance in affecting later school achievement, continuous and appropriately sequenced reinforcement in the grades is vitally important if the child is to maintain these gains throughout his school experience.
>
> It will be noted that the objectives of the Institute's curriculum program are founded on the abilities of the individual children rather than on stringent goals for each grade-level. Although our curriculum has been planned to go in logical sequence and order of difficulty from one step to another, the child is allowed to proceed at his own rate.

It should also be noted that our curriculum is not a static one. It undergoes constant revision and refinement ...

Many of the learning materials used by the children were developed by the project's own curriculum specialists. These materials generally adhered to some of the important principles of programmed instruction: the learners proceed by small steps through a carefully ordered sequence, with success and immediate feedback of results. A good deal of the work was motorific, since disadvantaged children seemed to learn best when physically manipulating letters, words, pictures. Much of the learning was through games which the children could play individually or in small groups. This arrangement allowed children to practice and proceed independently at their own rate.

The curriculum was organized as five "programs": prekindergarten and kindergarten, reading, mathematics, science, and creative dramatics. Reading, math, and science had their roots in the preschool instruction and were the curriculum bases in grades one through three. Creative dramatics was one vehicle for these three subjects, as well as for self-expression in representing "the human condition".

This organization of the program reflected the Institute's concern for the continuity of the curriculum; this continuity was reflected by the addition of the primary grades to the original preschool program, by the re-organization of supervisory responsibility on a school basis rather than grade basis, and by the emphasis upon individual pacing regardless of the grade in which a child finds himself.

A. Prekindergarten and Kindergarten

At this level, the curriculum was centered around the four cognitive areas mentioned below:

1. Language development. The classroom contained partitioned listening centers equipped with tape recorder and padded earphones. Individual children could listen repeatedly to the teacher's recorded voice telling their favorite stories, often pausing to elicit verbal responses ("'What did Peter see when he awoke and looked out the window?' Pause. 'Did you say snow? Yes, he saw snow'.").

Telephone instruments were used for conversation between children or between child and teacher. With the speakers at some distance apart and not visible to each other, the children were compelled to speak

distinctly and to use words rather than gestures (the children otherwise tended to communicate with a good deal of "Body English" accompanied by limited verbalization).

Language Masters were used by individual children to integrate visual and auditory stimuli simultaneously. This device presents a card with a picture or word visible to the child. The child hears the word simultaneously, and can respond by taping his own pronunciation of the word.

Some other techniques in language development at this level are illustrated in examples A to D of the Methodology: Specific Examples section.

2. Self-concept. Many children entering the program did not seem to know that people have names. Every day the teacher and assistant teacher greeted each child by name, and expected to be addressed by name in turn. A full-length mirror in each classroom allowed many children to see all of themselves for the first time. There was a camera for each room and each child was photographed throughout the year, participating in different activities. At Christmas time the child made a photo-album and took it home to his family. (These photos proved to be excellent language stimulants in the program, as the children discussed the photos with parents, teachers, and others.)

The primary objective was for each child to learn to cope successfully with the classroom environment as a means of establishing a feeling of competence which in turn would lead to enhancement of the child's self-image. Children were expected to learn self-reliance and self-care. They were encouraged to remove, put on, and hang up outer clothing; to get classroom materials from storage when needed and to return them; and to learn classroom routines.

Another example of the work in development of self-concept was the weekly visit made by a young Negro man to the classes. He grouped the entire class to participate in listening to and interpreting the timing and beat of musical records and instruments. His exercises took the form of a run-Harlem-rhythm-African-Negro-profile, which not only served the purposes of entertainment and enlightenment, but also served the purpose of instilling a sense of pride and respect for the community of Harlem and similar communities. This work was also performed throughout the grades.

3. Perception. The children often came from environments offering a limited range of simultaneous and competing stimuli (e.g., TV on, siblings crying). Thus the prekindergarten and kindergarten environments were organized by means of a special arrangement of equipment in the room. Different activities were concentrated in different parts of the room, often separated by partitions. The objective was to provide prepared activity areas in an orderly atmosphere which would offer perceptual experiences without barraging the children with too many distracting stimuli.

4. Concept formation. Many of the activities described above and below had concept-formation as an objective: the child learned to identify relevant traits which allowed otherwise dissimilar objects to be responded to as a class. (Buttons are buttons regardless of color, size, or means of attachment. See also the description of matrix games in the following section, Methodology: Specific Examples.)

B. Reading Program

Prior to grade one, children learned the forms and names of letters and left-to-right order in prekindergarten. In kindergarten they worked increasingly with two-dimensional (rather than three-dimensional) letters, and learned the sound of selected letters. These sounds were then blended into short words which the children learned to read. The Sullivan Readiness in Language Arts Program was added to implement objectives in the development of beginning reading skills. In the grades, they progressed to learning to read and comprehend more words (The Beginning Reading Program) and hence to reading books of their choice, writing book reports, and creating appropriate products (The Individualized Reading Program). Subsequently, the Sullivan Reading Program replaced the Stern Program in most of the grade classrooms. In beginning reading, word recognition skills were built using primarily a phonic vocabulary approach. Stern Workbooks were the basic guide, supplemented by Merrill Linguistic Readers, SRA early-readers, and teacher-made and Institute materials. Children worked in small groups according to level of skill, and were moved from group to group at the teachers' discretion. Word comprehension was built through vocabulary work and story analysis.

The Individualized Reading Program of grades two and three employed classroom library books, Charles Merrill Readers, SRA Reading Laboratory, and Readers Digest Skillbuilders. A series of typed word-recognition check-lists was prepared by the project reading specialist for classroom teachers' use. The specialist visited schools twice per week, assisting with the diagnosis of individual reading problems and the assignment of appropriate materials.

C. Mathematics Program

After 2 years' trial of other materials on a graded basis, the project staff adopted an ungraded mathematics curriculum of its own. Basically, this was a list of objectives, in sequence, along with suggested methodologies for attaining these objectives. The curriculum actually began prior to grade one with preliminary mathematical concepts. These appeared superficially non-mathematical (discrimination, sorting, conserving, matching), but were considered to be prerequisite to understanding of mathematics. Next came number concepts such as set, summing, equations, and derivation of algorithms, followed by work in measurement and geometry. The Institute math guide was supplemented by the Rasmussen Math Lab, Cuisenaire Rods, Stern Structural Kit, Houghton-Mifflin Modern School Mathematics, and tapes and games devised by project staff.

D. Science Program

As in mathematics, the project staff experimented with certain other materials, found them wanting, and began to develop their own units. An electricity unit with an inquiry approach was written and tried. However, the AAAS Process Approach to science was also judged relevant to the program's objectives, and its trial use began in 1967-68 in grades two and three. The processes emphasized by AAAS in the primary grades (measuring, classifying, inferring, etc.) are considered prerequisite to later learning in science as well as other areas. One unit (1 hour) of AAAS was taught each week. Since the AAAS approach required the purchase of many small items, purchasing was done centrally and the materials were distributed to teachers.

E. Creative Dramatics Program

Early in 1966, the Institute for Developmental Studies added creative dramatics, or teacher-guided play, to its enrichment program as a technique to stimulate and reinforce linguistic skills, to extend the means for building a positive self-concept, and as a method of vitalizing the content of various subject areas. Guided dramatic play is that activity in which children create drama through their own spontaneous dialogue and action under the guidance of the teacher who has been familiarized with the dramatic art process.

Educators have long been aware of the tendency of children to engage themselves spontaneously in dramatic-

play, and have noted the high degree of involvement and the sustained interest which children exhibit when so engaged. Many investigators of the problems of the disadvantaged child and the school curriculum have suggested that since these children tend to be more motor-oriented than verbally-oriented to learning, dramatic play might be a means of helping the child to successfully relate himself to the subject matter which the school attempts to present. Simply allowing for spontaneous dramatic play to take place in the classroom does not, however, give the child the tools he needs for using the dramatic form effectively and efficiently to gain understanding of the subject matter or insight into his own personal responses to a range of ideas and emotions.

The spontaneous playmaking of young children is generally unstructured, plotless, and repetitive. The materials he uses are those with which he is most familiar: sweeping the floor, fixing a meal, building a road and driving a car on it, putting out a fire, etc. Occasionally a complication is introduced: the cake burns, the car breaks down, the fire hose bursts. These tentative plot attempts are likely to be based on direct experience with such problems, and solutions are limited to those which the child has seen used.....The teacher's role, then, is to extend and enrich the child's dramatic play through interjecting new role and situation possibilities.....In the Institute's program it is planned that guided dramatic play will be used across the curriculum as a teaching approach to particular subject areas such as language arts and social studies.....It should be made clear that the Institute is <u>not</u> concerned with the production of formal plays for presentation to an audience. Guided dramatic play is process- rather than product-centered, and participant- rather than audience-centered.

As the children proceeded through the grades, they were given increasing responsibility for finding the problems of their dramatic play and for predicting consequences, seeking solutions, and integrating these into a total pattern. Parents, also, were instructed in the direction of creative dramatic play with their children. The creative dramatics specialist instructed and observed the teachers and supervisors in the implementation of these techniques.

F. Parent Activity

Each teacher conducted a monthly meeting for parents, and emphasized specific techniques the parents were to use to support the school program. These ranged from making lotto games for home use at the pre-K level to asking questions from story books brought home by the children in grade three. Parents were also encouraged to visit the classroom for the same general purpose.

Three rooms were donated by a local church for use as a Parent Center. Here, parents met in an informal atmosphere to pursue such interests as sewing and cooking as well as to learn additional ways of assisting in their children's education. They were encouraged to air complaints and discuss problems regarding the program and the schools, and to organize special events (40 parents arranged and attended a trip to the U.N.). The project's community aides and social workers were associated with the above activities and also provided an additional school-family liaison through their individual efforts.

G. Inservice Training

For new prekindergarten teachers, there was a 3-week orientation period before classes began. Periodically throughout the year, all teachers attended workshops and seminars conducted by consultants, outside speakers, and Institute staff. The objective of the inservice training was to sensitize teachers to the situation of their students, and to familiarize them thoroughly with the program's rationale and goals as well as its methods.

H. Dissemination

The Institute also developed many vehicles of dissemination, including films, seminars, workshops, classroom visitations, displays, and publications. The program served at least in part as a model for many other programs in the country.

Methodology: Specific Examples

Examples A to E, following, are representative of the pre-kindergarten and kindergarten program. Examples F to H illustrate, respectively, the reading, mathematics, and creative dramatics programs. Again, it should be noted that many more examples are presented in the original source (New York University, 1967).

A. The Letter Form-Board for prekindergarten and kindergarten children was developed at the Institute to provide a visual-motor experience in the development of letter-discrimination skills. It consisted of large wooden letters which were fitted into appropriately shaped slots on a board. The use of this board was based upon several assumptions: 1) the advantaged child may have facility with learning to read by whole-word methods because he is already familiar with the alphabet prior to first-grade, but the disadvantaged child is not; 2) the Board provides immediate feedback to aid learning - the child knows that this response is correct only when the letter fits; 3) the process of making fine discriminations, such as between O and Q, is learned; 4) the subsequent learning of the names and sounds will be easier if the children are first familiar with the letters on a purely visual and tactile basis.

Research with the board showed that letter-naive children did not profit greatly from working in pairs with more knowledgeable children (and presumably, then, should work alone or with other letter-naive children). Another study revealed that children introduced to a few new letters each day learned much faster than those faced with all 26 letters from the first day.

B. Another technique used in the prekindergarten and kindergarten classes for the development of languagewas the game Language Lotto, which differs from standard lotto games in that it can be played at different language and conceptual levels, or using no language. Standard lotto games are usually restricted to non-verbal visual matching of pictures.

Language Lotto consists of six games, each with several boards and up to 48 cards. The games are ordered to proceed from simple to complex, from single words to sentences, from concrete to abstract. Familiar objects are pictured in the first game, prepositions in the second, actions in the third, and so forth. In each, the child learns first on a receptive level and then on a productive language level.

C. Matrix Games were played by preschoolers:

Ideally, what you should see is five or six children sitting in small chairs in front of a board displaying 16 pictures in a 4-picture x 4-picture square. (The illustration used is the second in a series of 20 matrices, each having a different linguistic and cognitive emphasis, such as prepositions, negatives, or classifications.) Examination of the pictures reveals certain regularities: in the first column, all of the children are holding cookies; in the second, all of the children are wearing gloves; in the third all are drinking milk; and in the fourth all are wearing hats. Scanning the pictures by rows reveals that each row has a common element: one boy, two boys, one girl, and two girls.

If the children had been playing the games for a few weeks, one of the children might be sitting in the adult chair while the other four and the teacher are sitting in children's chairs. The child playing the role of the teacher might be heard saying to "her" class, "Close your eyes, no peeking." Then she would get out of her chair and cover one of the pictures with an opaque magnetized rectangle. "Now open your eyes. Who can tell me something about the picture that I covered?" Whereupon several of the children raise their hands, and the child-teacher calls upon one of them.

What is the content involved in figuring out the covered picture? What must the child be able to do in order to come up with the answer? To produce a complete answer, the child must be able to (1) scan the pictures both vertically and horizontally, (2) abstract the common element of both the row and the column of the hidden picture,(3) combine these two pieces of information, (4) produce the information in a sentence, and (5) explain in words how he figured it out. Underlying the solution to this type of matrix problem are classificatory skills, which have been found to be more difficult for children from lower-class backgrounds than for their middle-class peers, especially when the contents are presented by pictorial representation.

The Matrix Games curriculum has concerns other than the complex cognitive abilities involved in solving the above problem. Within the context of the children's play there are other objectives: to speak clearly; to follow complex directions; to develop new vocabulary and concepts; and, most important, to be an independent learner.

The matrices were used in a programmatic sequence designed to carry the child forward in small steps with frequent feedback. Sometimes the game was played between the teacher and one child, and sometimes by small groups.

Many of the activities so far described for the prekindergarten and kindergarten were engaged in during the quiet work time which began the day at these levels. This time was designated specifically for individuals and small groups to practice cognitive skills, usually in game situations. Noisy activities such as blockbuilding were excluded during this period.

D. As with many of the other activities, the game of Simon Says was played in a manner consistent with the principles of programmed instruction: the children were taken through a planned sequence in small steps and with immediate feedback as to their performances. The principal objective was that of getting the children to attend to essential verbal cues while learning to ignore incorrect visual or nonessential verbal cues, a skill in which it was felt that these children particularly needed help.

The teacher introduced the game giving correct verbal and visual cues ("Simon Says, Put your hands on your hips"). After the children had mastered this phase of the game, the visual cues were omitted, and the children relied on listening (with the teacher watching to see that each was responding to her verbal cue and not to neighbor's visual cue). She then moved in order to more complex directions, telling and mis-showing, then occasionally omitting the necessary clause, "Simon Says", and finally omitting and mis-showing.

E. It has been frequently noted that disadvantaged children have a present-time orientation, with limited concepts of past, future, and extended time units such as weeks and months. A calendar curriculum was devised utilizing the principles of programmed instruction to teach these concepts. Each week the kindergarten teacher placed a 1-week calendar of seven rectangles in a row upon the board. Saturday and Sunday, both together at the left, were marked with X's in colored chalk. Each day she placed an X in the box for that day. These X's were white, to distinguish school-days from non-school days. She also mentioned the name of the day, but did not require yet that it be learned. As a second, third, or fourth row was added, the concept of week was learned and that of month began to be learned. The children also began to mark their own personal calendars each day. Teachers began to add variations, such as games which built number and phonic skills as well as names of day ("Find the box for the day in third week that begins with the sound t").

F. A number of reading games were developed by the Institute staff. These dealt mostly with first- and second-grade reading skills, and were played by two to four children. The following is an example:

Sight Word Bingo

I. Purpose: The game offers practice in recognition of sight words taught in Book B of the Stern workbooks.

II. Materials: The game includes four playing boards, each divided into 25 squares in which 24 sight words are printed, the same words in different squares on each board. The center square is blank. Twenty-four sight word-cards and bingo chips are also included.

III. Play: The game can be played by two to four children. Each child takes one (or two) playing boards. All the players cover with a chip the blank space in the center of their boards. The word-cards are mixed and placed face down on the table. The first player picks the top word-card and reads the word. All the players then scan their boards, left to right, top row to bottom row. When a player finds the word on his board, he covers it with a chip.

After a word is read from a word-card, the card is placed face down on the table.

The child to the right of the first player picks the next word-card and reads the word. All the players again scan their boards and cover the word with a chip. The game continues in this fashion with players taking turns reading the word-cards. The first player to cover five words in any direction is the winner.

IV. Preceding Activities: Children should be introduced to the sight word in Book B of the Stern workbooks before playing the game.

V. Succeeding Activities: Children should be introduced to additional sight words needed for reading specific easy reading books assigned by the teacher to the individual child. Children can make their own dictionaries for new sight words.

G. A sample activity of the mathematics program:

Review addition using the abacus, but without exchanging. Ask a child to show the sum of 52 and 7, for example, on the abacus. Next have a child try a similar example, requiring regrouping, such as 52 and 8. If he is stumped, ask him to tell you what the trouble is. He may tell you that he does not have enough beads in the ones column. Now ask him what he should do, and prompt him to say that nine and one more puts him into the next column, or place. Show the children at this point, that when you exchange the 10 ones for one 10, you must place a zero in one's place to hold the two columns. Several other similar examples stressing the use of the zero should be presented.

H. In the creative dramatics activities, the teacher played any of several kinds of roles. For instance, when children had initiated a spontaneous play, she may have entered as one of the characters, who: 1) sought help ("Where do I buy my ticket for this train?"), 2) changed the situation ("A child has just been hurt on the street. Can you help us?"), or 3) added another dimension to the story which the children had set up ("I have a lot of wonderful gadgets for sale that you could use in your housework. May I show them to you?").

Or, she may have assumed the usual teacher role in a more direct initiation of dramatic play ("Let's pretend that this rug is a boat. Where shall we go? Who will help row the boat? Who will be the lookout?").

Evaluation

A. Measures of Achievement

While many measures were used at various times in this program, including the Gates-MacGinitie, the WISC, and the Lorge-Thorndike, three tests were used more consistently to record progress: the Stanford-Binet, the Peabody Picture Vocabulary Test, and the Columbia Mental Maturity Scales (Goldstein, 1968b).

Six "waves" of pupils were tested, one having begun in the program each year 1962-67. Wave 1 was in fourth-grade in the 1967-68 school year, Wave 4 in first-grade, Wave 6 in prekindergarten. The

number of pupils originally in each wave varied between about 120 and 200, including controls.

The first two waves were considered to be a pilot study, and it is these two which in 1967 and 1968 respectively had reached the end of their "enrichment period." Goldstein (1968a) points out that these waves did not in fact receive much enrichment beyond kindergarten (i.e., 2 years) because the grade classes were not very different from the regular ones. Starting with the third wave in 1964-65, the program began in earnest, although enrichment continued to be concentrated chiefly in the first 2 years.

For this description a careful analysis of the total testing program, 1963 through 1968, was carried out using data from all available reports (see sources). While the table compiled was incomplete, it emphasized the fact that evaluation of this program has been hindered by several factors. The first is the attrition rate. By 1967, 53 percent of the experimental pupils in one school in the first (1962-63) wave had been lost, along with 83 percent of their controls (Deutsch and Goldstein, 1967a). Since the reasons for attrition cannot be determined, its effects upon the mean ability of the sample are unknown. While it is possible that the more able children were more mobile than the less able, in Harlem at least, the opposite may also have been true. To keep the classes within practical limits, new pupils were taken into the program, thus confounding much of the evaluation for any reader.

The second factor which has hindered evaluation is the arrangement by which only sub-samples were tested, generally speaking, at each testing time (fall and spring). The figures offered in the series of evaluation reports do not enable the reader to determine how the sub-samples were selected, nor whether there were any other possible sources of bias. This leaves doubts about the comparisons, even in the face of the sophistication of the analysis of variance employed.

A third factor making interpretation difficult is the use of different tests at various points in the program. The Stanford-Binet offers the most consistent record.

The A.I.R. 1963-68 analysis did not reveal any clearly distinguishable trends, and it is expected by the Institute for Developmental Studies that such trends will only be identified when further data analysis now in progress is reported, probably in Part II of the Institute for Developmental Studies' report to the Ford Foundation.

The measured benefits of this program are therefore reported here in terms of fairly isolated analyses carried out by the I.D.S. staff, and the interpretations are theirs. The statistical technique most frequently used was analysis of variance. It appears that this technique was chosen on account of wide variations in the distributions of scores of groups being compared; the exigencies of the practical situation resulted in control groups that were relatively poorly matched on test scores, although similar in age and socio-economic background to the experimental samples. This means that for the layman it is more difficult to draw general conclusions.

Deutsch and Goldstein (1965) reported that for the second wave Stanford-Binet means on pretest were not significantly different for experimentals and basic controls, whereas significant differences (at the 5 percent level) were found to exist between the groups on posttest at the end of the prekindergarten year (see Table 1).

Table 1

MEAN STANFORD-BINET IQ SCORES FOR EXPERIMENTAL AND CONTROL SUB-SAMPLES IN WAVE 2 OF THE EARLY CHILDHOOD PROGRAM FALL 1963 AND SPRING 1964 (PREKINDERGARTEN)

Sub-sample drawn from	Mean Stanford-Binet IQ Fall 1963	Mean Stanford-Binet IQ Spring 1964
Experimental Wave 2	93	99
Basic Control Group (C_{ss})	95	94

[Source: Tables 1 and 3, pages 3 and 4, Deutsch and Goldstein (1965)]

Similarly, Deutsch and Goldstein (1966b) reported that for the first wave, Stanford-Binet means on posttest at the end of 2 years of enrichment were significantly better (at the .01 percent level) for experimentals than for basic controls. The two groups were presumably initially not significantly different on this test; certainly they are reported (Deutsch and Goldstein, 1966b) as being matched on the Peabody Picture Vocabulary Test (PPVT). On the Columbia Mental

Maturity Scale (CMMS), the means for experimental and basic control groups were not statistically significantly different on pretest, but were (at the .01 percent level) on first posttest, only to become not different again on second posttest (see Table 2).

Table 2

MEAN COLUMBIA MENTAL MATURITY SCALE IQ SCORES FOR EXPERIMENTAL AND CONTROL SUB-SAMPLES IN WAVE 1 OF THE EARLY CHILDHOOD PROGRAM, WINTER 1962-63, SPRING 1963 (PREKINDERGARTEN), AND SPRING 1964 (KINDERGARTEN)

Sub-samples drawn from	Mean CMMS IQ Winter 1962-63	Mean CMMS IQ Spring 1963	Mean CMMS IQ Spring 1964
Experimental Wave 1	101	104	97
Basic Control Group (C_{ss})	105	92	94

[Source: Tables 5, 6, and 7, Deutsch and Goldstein (1966b)]

Deutsch and Goldstein (1966b) also reported that for the second wave, CMMS means were not significantly different for experimental and basic control sub-samples on pretest. On first posttest the experimental sub-sample was significantly better, but on second posttest the control group was significantly superior (see Table 3).

For the third wave, Deutsch and Goldstein (1966b) reported that Stanford-Binet means were not significantly different for experimental and basic control sub-samples on pretest, nor on first posttest. On PPVT means, however, differences in favor of the experimentals were shown on posttest (at the 1 percent level) but not pretest. For CMMS means the reverse was true. This series of testings illustrates well the inconsistency of results obtained under the experimental conditions prevailing in this program. The attrition of the basic control group was severe, perhaps accounting for some of the inconsistent patterns.

Table 3

MEAN COLUMBIA MENTAL MATURITY SCALE IQ SCORES FOR EXPERIMENTAL AND CONTROL SUB-SAMPLES IN WAVE 2 OF THE EARLY CHILDHOOD PROGRAM, FALL 1963 AND SPRING 1964 (PREKINDERGARTEN), AND SPRING 1965 (KINDERGARTEN)

Sub-samples drawn from	Mean CMMS IQ Fall 1963	Mean CMMS IQ Spring 1964	Mean CMMS IQ Spring 1965
Experimental Wave 2	102	103	96
Basic Control Group (C_{ss})	101	94	101

[Source: Tables 14, 15, and 16, Deutsch and Goldstein (1966b)]

Later, Deutsch and Goldstein (1967b) reported an analysis of Stanford-Binet scores for each of the first four waves. Besides indicating that the pretest means of the experimental and basic control groups were not significantly different in the case of each wave, the analysis showed that for the second through fourth waves the experimental groups performed significantly better on first posttest (at the end of prekindergarten) when compared with the basic control groups pooled with the groups chosen as supplementary controls (C_k). Significant differences were also found when comparing the experimentals with the pooled controls at the end of kindergarten (second posttest). The means are shown in Table 4.

Deutsch and Goldstein (1967b) summed up this section by writing:

> The analyses ... give strong evidence for the effectiveness of the experimental treatment in terms of producing IQ differences in favor of the experimental group at the end of the prekindergarten period and maintaining these differences at the end of kindergarten.

The same report mentions, however, that although the second wave experimental pupils had a higher mean on the Stanford-Binet at the end of first-grade (third posttest), this mean was not significantly different from that of the two control groups (C_{ss} and C_k) combined.

Table 4

MEAN STANFORD-BINET IQ SCORES FOR EXPERIMENTAL, CONTROL AND SUPPLEMENTARY CONTROL SUB-SAMPLES IN WAVES 2 THROUGH 4 OF THE EARLY CHILDHOOD PROGRAM ON PRETEST

Sub-samples drawn from	Mean Stanford-Binet IQ								
	Wave 2			Wave 3			Wave 4		
	Pre	Post 1	Post 2	Pre	Post 1	Post 2	Pre	Post 1	Post 2
Experimental Waves	93	99	95	92	101	102	91	97	101
Basic Control Group (C_{ss}) Pooled with Supplementary Control Group	92	90	92	90	93	94	89	91	92

[Source: Tables 1, 3, and 4, pages 14, 16, and 17, Deutsch and Goldstein (1967b)]

Deutsch and Goldstein (1967b) also reported that the Gates-MacGinitie Primary Reading Tests and the Gates Advanced Primary Reading Test were used in first- through third-grades for the third, second and first waves. While the third wave showed significantly better scores for the experimentals compared with the basic control group (C_{ss}), the other two waves revealed no differences between groups. The authors commented that the third wave experimentals showed better performance in a skill which the enriched curriculum does not stress.

In a study to detect the practice effects of frequent testing using the Stanford-Binet, Deutsch and Goldstein (1967d) compared sub-samples more frequently tested with those less frequently and found no significant difference. In the same report the first wave's results on the Stanford-Binet at the end of prekindergarten, kindergarten and third-grade were tabulated. Comparison of experimentals and basic controls (C_{ss}) showed significant differences (at the 5 percent level) in favor of the experimentals on each testing. Deutsch and Goldstein remarked that:

> The experimental treatment ... was effective in maintaining the Stanford-Binet IQ's of the experimental

children at a level significantly higher than that of the C_{ss} subjects, over a period of 4 to 5 years.

Goldstein (1968a) reported a study of Metropolitan Achievement Test scores obtained in the fall of 1966 for children in the first and second waves (then in third- and second-grade), from experimental groups only. He concluded that the long-term effects of the enriched prekindergarten and kindergarten curriculum had not been evidenced in a significantly higher level of achievement for the experimental subjects, as measured by the reading and word knowledge subtests of the MAT. He attributed these results to the fact that the first two waves were pilot groups, and received little enrichment beyond the end of kindergarten.

It should be noted that several other tests of cognitive achievement were employed, including some developed by the Institute for Developmental Studies. The chief findings to date, however, are not based upon them.

B. Other Evaluation Indices

Over the 6 years of operation of this program observations of teachers and pupils, and evaluations of techniques and materials have been made by project staff. Many of these are described in a recent report (New York University, 1968b). The descriptions add to the impression created elsewhere of a detailed and complex experimental program which is appreciated by its participants, both adults and children. Parent response to the program has been excellent, culminating in strong requests in 1968 for its continuation.

C. Modifications and Suggestions

A proposal submitted by the Institute for Developmental Studies for the 1968-69 year showed that the basic program would be continued in its 1967-68 form. Changes proposed were chiefly directed towards increasing the scope of curriculum and methods assessment, towards strengthening the curriculum through intensive study of its present content, and towards deepening the analysis of teaching strategies and classroom management. Many possible innovations were proposed for trial, such as combining mathematics and science in a laboratory setting in two of the schools in the program, for pupils in the grades. None was named as absolutely essential for continuation of the basic program.

Budget

The budget for replication of this program cannot be estimated. The cost per pupil per year has been $1800-$2100, but included in this figure are many indirect costs related to the research and development aspects of the program. These would not all be incurred again, by any means.

In 1967-68 there were four full-time supervisors; the salaries of three were paid in part from the program. Similarly, the teachers were paid in part from the program, while the assistant teachers, the community aides, the social worker, and all other program personnel were paid for in full from the program.

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