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ABSTRACT

The objectives of this project in Philadelphia were (1) to develop an effective remedial instructional program in an inner-city school and (2) to chart the progress of the subjects over a whole school year. Forty-eight pupils of verbal IQ's of 80 to 100 and reading levels of 3.0 grade level were divided into an experimental group and a control group of 24 pupils each. The experimental group had daily work in a reading classroom which had small group instruction with SRA Reading Laboratory materials, programed and regular reading workbooks, and staff-prepared Word Analysis Units. Testing of the students on the Metropolitan Achievement Tests (MAT), Primary II and an Informal Reading Inventory (IRI) was conducted after three 10-week periods. Significant improvement on the MAT was shown only after the third 10-week period and was not substantially different from gains made by the control group. The IRI showed the experimental group to be 1 year ahead of the control group. The problem of pupil persistency in work is examined and suggestions as to how similar projects could be improved are made. Tables and graphs are included. (AL)

REMEDIATION IN READING FOR FOURTH GRADERS:

A Project Report for 1969-70

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This is a report of an intensive program designed to improve the reading skills of low-achieving pupils in an inner-city school. The program was sponsored by the School District of Philadelphia and Temple University. This paper includes details of the project, the results, and discussion of areas that warrant improvement. Our purpose in writing is to share our experiences and results with other educators who are conducting or expect to conduct intensive programs in reading; a large portion of this report is devoted to discussions of materials and procedures, problems encountered, and suggestions.

Objectives

The study was planned with two objectives: (1) to develop an effective remedial instructional program in reading skills in an urban school, and (2) to chart the gains in reading skills made by the pupils during a whole school year. The second and third authors had conducted a successful, intensive, nine-week remedial reading program in a neighboring school during the preceding year (1968-69) (see ERIC ED:045 305). It was desirable to ascertain whether the dramatic rate of growth that could be attained in a short period could be sustained for a school year; accordingly, this program was made longer, and the progress of the pupils was assessed frequently. The program was also intended to be a model for the regular teachers in the school, who were given class sets of materials to help remediate reading deficiencies of their pupils.

Characteristics of the Program

The instructional program was divided into three cycles, each approximately ten weeks long. Changes were instituted after the first and second cycles on the basis of classwork and achievement on reading tests. In this section of the report, an overview of the major characteristics of the program will be presented first under the headings: Procedures, Sample, Personnel, Group size, and Testing. Then a description will be given of the curriculum and methods that were used in each cycle and of the scores that were used for diagnosis.

Procedures. The experimental pupils came daily to a reading classroom, or Center, for small group instruction in reading skills. One teacher and three teacher-trainees each taught a group of three to six pupils. The teachers prepared individualized assignments consisting of commercially available, graded cards from the SRA Reading Laboratories,

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programmed and regular reading workbooks, and Word Analysis Units compiled by the program staff. Each pupil was expected to proceed through the sequential materials at his own pace.

During the first, 10-week cycle, points were awarded as token reinforcers that could be exchanged for goods once a week; the instructional sessions were 150 minutes long. In the second and third cycles, only social reinforcement was used; the sessions were 50 minutes long. When they were not in the Center, the experimental pupils were with their regular classes and teachers. The control pupils remained with their regular classes except during testing periods.

Sample. In order to qualify for the program, fourth grade pupils had to have verbal IQ scores of 80-100 and grade equivalent scores in reading below 3.0 (at least one year below grade level); the scores on the Primary Mental Abilities Tests (Science Research Associates), given in the fall of the pupils' second year in school, were used for the IQ level; for the reading level, reading scores from the Iowa Tests of Basic Skills administered the previous spring were used, as well as reading scores on the Metropolitan Achievement Tests, given just before the program started.

From among the pupils who were qualified for the program, 24 were randomly selected for the experimental group and 24 for the control group. The mean initial MAT reading levels were 1.94 for the experimental group, and 1.98 for the control group (See Table 1). The mean IQ scores were 91.06 for the experimental group, and 90.65 for the control group.

Sixteen experimental and 20 control pupils remained in the program through the final testing period. Attrition was due primarily to transfers of pupils to other schools when their families moved. Experimental pupils who left the program were replaced in the reading classroom by similarly qualified pupils who had not originally been in either group, but the scores of the new pupils were excluded from the statistical analyses.

Personnel. The program was directed by the second author, an associate professor of curriculum and instruction at Temple University. The third author, an associate professor of educational psychology at Temple, consulted on research methodology and teacher behaviors, and the first author was the full-time teacher in the Center. Teacher-trainees from Temple University and Antioch College worked in the Center--the Temple students taught for 12-week periods as part of their practice teaching, and the Antioch student taught for the whole year and received a salary. The usual staff in the Center was one teacher, the Antioch student teacher, and two Temple student teachers.

The director observed in the Center thrice weekly and met twice weekly with the teaching staff. The teacher and Antioch student teacher collected the data, and all the student teachers agreed to accept a grade for student teaching based on the achievement of their pupils compared with the control group.

TABLE 1

INITIAL MEAN GRADE EQUIVALENT SCORES
OF EXPERIMENTAL AND CONTROL PUPILS

Test	Experimental Group[1]	Control Group[2]
Primary Mental Abilities (IQ)	91.06	90.65
Metropolitan Achievement Tests (Primary II)		
Reading	1.94	1.98
Word Discrimination	2.27	2.27
Word Knowledge	2.24	2.27
Arithmetic Total	2.78	2.62
Individual Reading Inventory	1.5	0.5
Iowa Tests of Basic Skills		
Vocabulary	2.19 (N = 14)	1.93 (N = 18)
Reading	2.08 (N = 14)	2.23 (N = 17)
Language Total	2.25 (N = 14)	2.38 (N = 17)
Arithmetic Total	2.47 (N = 12)	2.36 (N = 18)

[1] N = 16
[2] N = 20

Group size. The ratio of four adults to 24 pupils in the program allowed for small group instruction. Although the original groups contained only six pupils each, the handicaps of noise and pupil dependency required the development of alternative arrangements.

In the first cycle, six pupils were assigned to each teacher; three groups met in the morning, and one group met in the afternoon. During the morning session, the fourth teacher acted as a behavior manager, guiding straying pupils back to their groups and occasionally supervising the work of one or two pupils.

A change was made in the groups at the beginning of the second cycle which lasted until the end of the program. All four teachers taught a group of four pupils in the morning, and one teacher continued to meet six pupils in the afternoon. The role of the behavior manager was eliminated in order to have smaller ratios of teachers to pupils.

Further discussion of the use of student teachers and the small teacher-pupil ratio will be included below in the section, Discussion of Program Components.

Testing. Both standardized and informal tests were administered at frequent intervals. Equivalent forms of the Metropolitan Achievement Tests (MAT), Primary II (Harcourt, Brace and World), were administered to all experimental and control pupils four times: as a pretest in September before the program began, after 10 weeks of the program (in mid-December), after 9 more weeks (in mid-March), and after the last 10 weeks (in early June).

Scores were obtained on these four subtests of the MAT: Word Knowledge, Word Discrimination, Reading, and Arithmetic. Word Knowledge tests ability to select one word to label a picture and ability to select a synonym to complete a sentence. Word Discrimination tests ability to select one word that the teacher reads aloud and uses in a sentence from a group of four words with similar sounds and spellings. Reading requires the selection of one sentence out of three to describe a picture and also the answering of three to four comprehension and inferential questions on each of several paragraphs four to eight sentences long. Arithmetic tests ability to choose picture answers and to write numerical answers to problems read by the teacher and the ability to add and subtract 30 pairs of numbers with one to three digits.

The Primary II level of the MAT, published in 1959, was designed for use in grade 2, but we used it for the fourth grade pupils because the Primary II level best represented the range of their skills in reading. The range of possible grade equivalent scores on the test was from 1.0 to 4.9.

An Informal Reading Inventory (IRI) devised by the School District of Philadelphia from basal reader content was given individually to all pupils within two weeks of the beginning of the program, to the experimental pupils every three to four weeks thereafter, and to the control pupils

in December and June. To avoid repetition of the selections, various sets of readers were used. For the IRI each pupil was asked to read a selection silently and then to respond orally to four questions read by the teacher, one each on vocabulary, factual detail, inference, and the pupil's experience. The mean level of the experimental group on the first IRI was first grade; the mean level of the control group was primer, or one level below first grade.

First cycle. Daily work required of all pupils during the first cycle, of 10 weeks' duration, included the following: 3 cards from the Reading Laboratories (SRA), 10 pages in teacher-made workbooks to supplement the SRA cards, 10 pages in programmed workbooks by Sullivan (McGraw-Hill), and 3 worksheets of word problems in arithmetic. Pupils began work on the SRA Reading Laboratory cards at the 1.2 reading level. A token reinforcement system was used to enhance pupil persistency.

At the end of the 10-week cycle, the gains of the experimental group on the Metropolitan Achievement Tests were these: Reading, 5.4 months; Word Discrimination, 3.1 months, Word Knowledge, 1.7 months; Arithmetic, 2.1 months; on the IRI, the gain was 1.9 years. Because it was impossible to maintain pupil persistency for the whole 150 minutes, it seemed reasonable to reduce the length of the sessions and to modify the curriculum for the subsequent cycles.

Second cycle. During the second cycle, of 9 weeks' length, the sessions were reduced to 55 minutes, and pupils were assigned daily 1-2 SRA Reading Laboratory cards, 1 page in a Word Analysis Unit (described below), and one of these: 5-10 pages in a Sullivan programmed book, 5-10 pages in a Basic Reading Skills workbook (SRA), or 1 card from the Reading for Understanding Laboratory (SRA). The token reinforcement system was discontinued because the pupils were expected to be able to work for an hour with social reinforcement alone.

Emphasis on word analysis was increased because the pupils lacked experience with compound words, contractions, and syllabication that were included on the SRA Reading Laboratory cards. To supplement the cards, Word Analysis Units were compiled from commercially available materials and taught.

Compared with the first cycle, gains were smaller in Reading (1.1 months), larger in Word Discrimination (3.9 months), and about the same in Word Knowledge (1.9 months). Work in arithmetic had been discontinued, but the pupils continued to gain (2.8 months). Gain on the IRI was approximately 1 month. These gains appeared to reflect the reduced instructional time on reading and comprehension as presented by the SRA Reading Laboratory cards, and the increased time on word analysis. Pupils continued to have difficulty in persisting.

Third cycle. During the third cycle, of 10 weeks' duration, the length of the sessions remained the same. Problems in rescheduling precluded lengthening the sessions for the third cycle in order to increase time on task. Pupils continued to be assigned 1-2 SRA Reading Laboratory cards, and the work assigned on the Word Analysis Units was increased to

2-3 pages per day. Nearly all workbook activities were abandoned, because those activities had not seemed to be reflected in the test scores. Some of the personnel wanted to try some techniques of the open classroom, and so pupils who finished their assigned work were allowed to play word games that reviewed the concepts on the SRA cards or to read library books in an informal setting in the Center for 10-15 minutes.

Final tests showed small gains and losses during the third cycle: Reading, 1.1 months; Word Discrimination, -1.4 months; Word Knowledge, 1.1 months; and Arithmetic, 0.3 months. The gain on the IRI was about 3 months. The growth in Reading thus continued at the same rate in the second and third cycles, perhaps reflecting the constant amount of work on the SRA Reading Laboratory cards assigned during the second and third cycles. For some reason, there was a loss in achievement in Word Discrimination, even though the amount of work in the Word Analysis Units was increased during the third cycle.

Overall Results and Discussion

In this section, the statistical tests that were conducted will be described, and the gains in reading achievement attained throughout the program will be discussed.

Tests of significance. Differences between the mean scores of the experimental and control students were tested by analysis of covariance at the end of each cycle (Table 2). In each analysis, IQ scores and the appropriate pretest scores (September administration) were used as covariates. No significant differences were found on the MAT at the end of the first or second cycle. Significant differences were obtained favoring the experimental group on the third cycle posttest (in June) in Reading ($p < .05$) and Word Knowledge ($p < .05$), as well as on the IRI scores in December ($p < .01$) and in June ($p < .01$).

Pupil Growth Throughout the Year

One of the major purposes of this program was to watch carefully the progress of the pupils throughout the year. This was accomplished by administering various forms of the Metropolitan Achievement Tests approximately every ten weeks during the program, and by administering the Individual Reading Inventory every three to four weeks. Records were kept of the work assigned and completed daily by every pupil in the experimental group; these data were invaluable for evaluation and planning. Additional data were available at the end of the program: the Iowa Tests of Basic Skills were given to all pupils in the Philadelphia public schools in May 1969, and May 1970; the scores of the experimental and control groups are summarized below in this report.

Metropolitan Achievement Tests. Overall gain for the experimental group for the eight month period from late September to early June was

TABLE 2

MEAN GRADE-EQUIVALENT SCORES ON ACHIEVEMENT TESTS

Test	Group	Occasion of Test Administration			
		September Pretest Form A	December Cycle 1 Form A	March Cycle 2 Form B	June Cycle 3 Form C
Metropolitan Achievement Tests (Primary II)					
Reading	E[1]	1.94	2.48	2.58	2.69*
	C[2]	1.98	2.23	2.39	2.25
Word Discrimination	E	2.27	2.58	2.98	2.84
	C	2.27	2.60	2.80	2.67
Word Knowledge	E	2.24	2.41	2.59	2.70*
	C	2.27	2.32	2.36	2.44
Arithmetic Total	E	2.78	2.99	3.26	3.29
	C	2.62	2.77	3.01	3.00
Individual Reading Inventory	E	1.5	3.1***	No data	3.5**
	C	0.7	1.9	No data	2.5

[1]Experimental group N = 16

[2]Control group N = 20

*p <.07

**p <.05

***p <.001

7.56 months in Reading (.75 years), 4.62 months in Word Knowledge, 5.75 months in Word Discrimination, and 3.29 months in Arithmetic (Table 3). Although the gain for the control group was less on all subtests, and the mean final scores of the two groups were significantly different on Reading and Word Knowledge, the gains of the experimental group were not particularly encouraging. No remediation can be claimed; at best these students did not fall any further behind.

Graphs containing pupil mean scores on the subtests of the MAT at each administration are presented in Figures 1 through 4. The pattern of each subtest appears different, so that no summary description of growth patterns across all subtests seems possible. The amount of growth between every pair of test administrations is also presented in Table 3.

In Reading (Figure 1), the greatest gain for both the experimental and control groups was made during the first cycle. Indeed, relatively little growth was measured for the period from December to June (Table 3). For the experimental students, 75 percent of their growth during the program was obtained in the first ten weeks. During the remaining five months from December to June, the experimental students gained only two months in Reading. The control students followed the same pattern; 80 percent of their Reading growth occurred in the first ten weeks, and they gained less than one month from December to June. This pattern of diminishing Reading growth is repeated in the results of the IRIs. For both groups, 75 to 80 percent of the gain for the year was obtained by the end of the first ten weeks.

The pattern of diminishing growth is generally replicated for the other subtests of the MAT. For both the experimental and control groups, gains during the final cycle (March to June) were smaller than gains during the other two cycles. The largest gain for the experimental pupils during the second cycle was in Word Discrimination, and this gain appears to reflect the introduction of Word Analysis Units during that period (see discussion of Materials, below).

The pattern of diminishing returns, particularly in Reading, is of great concern. It has caused our reconsideration of short term programs of intensive remedial instruction which last for two or three months.

Informal Reading Inventory (IRI) The IRI was administered every three to four weeks to the experimental pupils, and three times to the control group. Significant differences favoring the experimental group were obtained in December ($p < .01$) and again in June ($p < .05$) (See Figure 5). On both occasions the experimental pupils were approximately one year ahead of the control pupils. It is noteworthy that the IRI is not a standardized instrument, and scores may vary according to the reading selections used and the decisions which the test administrator must make arbitrarily; however, the same personnel administered all the IRIs, and so the same standards were maintained.

The higher scores obtained by the experimental group on the IRI may contain both the effects of learning accomplished by the experimental

TABLE 3

MEAN GRADE-EQUIVALENT GAINS IN YEARS ON ACHIEVEMENT TESTS

Test	Interval Between Test Administrations							
	September-December		December-March		March-June		September-June	
	E[1]	C[2]	E	C	E	C	E	C
Metropolitan Achievement Tests (Primary II)								
Reading	.54	.25	.11	.16	.11	-.14	.75	.27
Word Discrimination	.31	.33	.39	.20	-.13	-.14	.57	.40
Word Knowledge	.17	.05	.19	.05	.11	.08	.46	.17
Arithmetic Total	.21	.15	.28	.24	.03	-.01	.51	.38
Individual Reading Inventory	2.6	1.4	No data		No data		2.0	2.0

[1]Experimental group N = 16

[2]Control group N = 20

FIGURE 1

MEAN GRADE EQUIVALENT SCORES
ON METROPOLITAN ACHIEVEMENT TEST (READING)

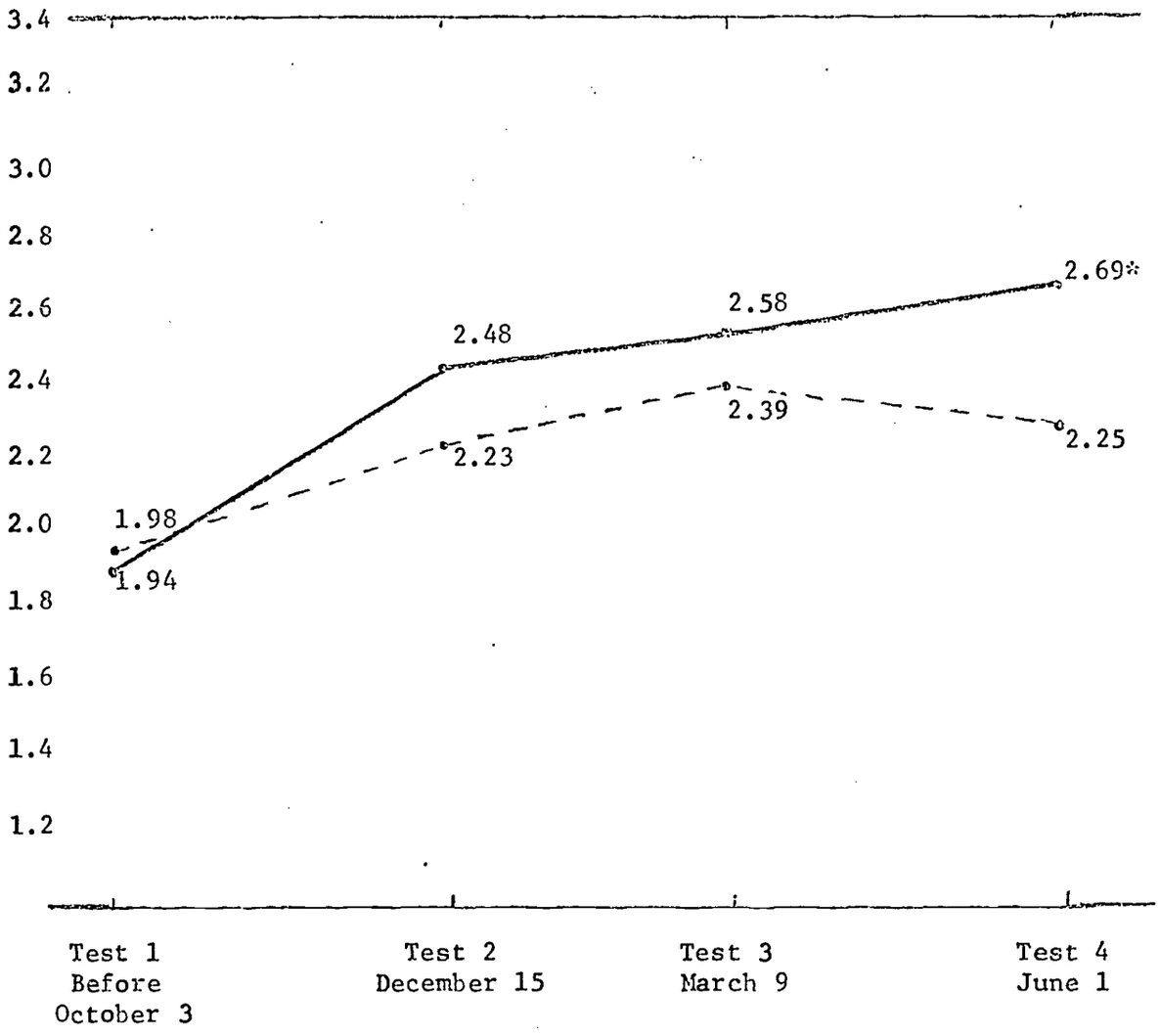


FIGURE 2

MEAN GRADE EQUIVALENT SCORES
ON METROPOLITAN ACHIEVEMENT TEST (WORD KNOWLEDGE)

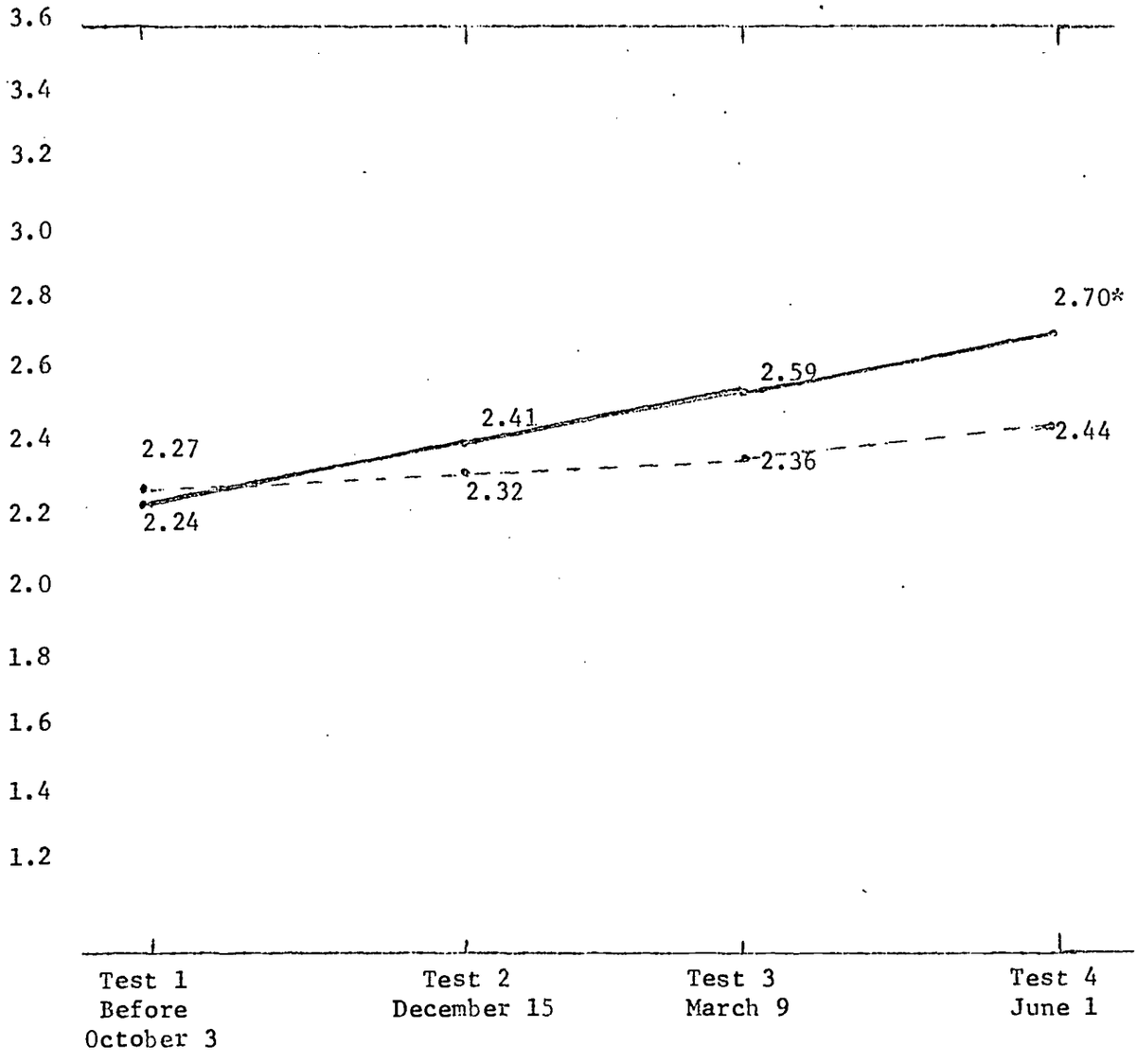


FIGURE 3

MEAN GRADE EQUIVALENT SCORES
ON METROPOLITAN ACHIEVEMENT TEST (WORD DISCRIMINATION)

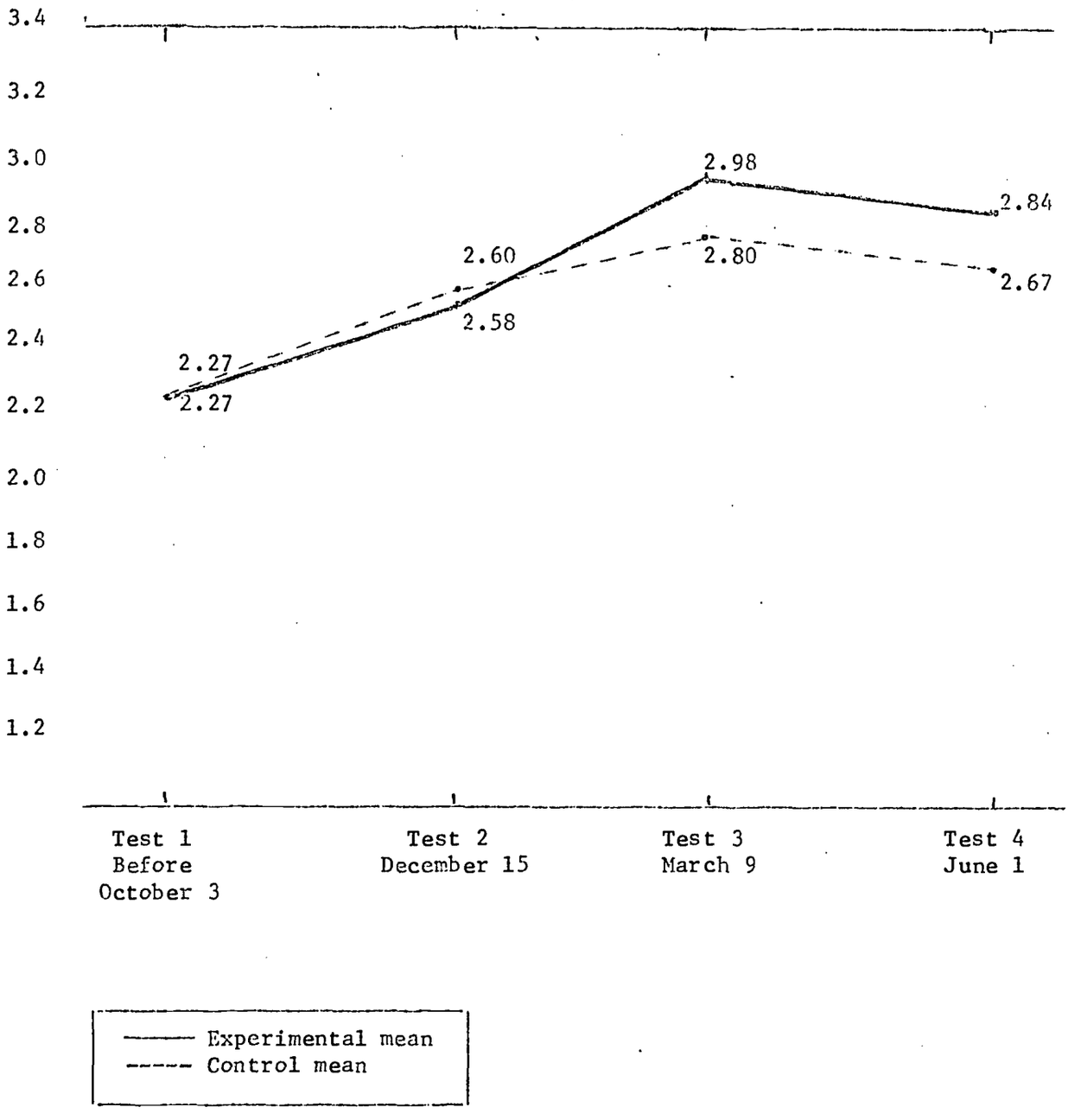


FIGURE 4

MEAN GRADE EQUIVALENT SCORES
ON METROPOLITAN ACHIEVEMENT TEST (ARITHMETIC)

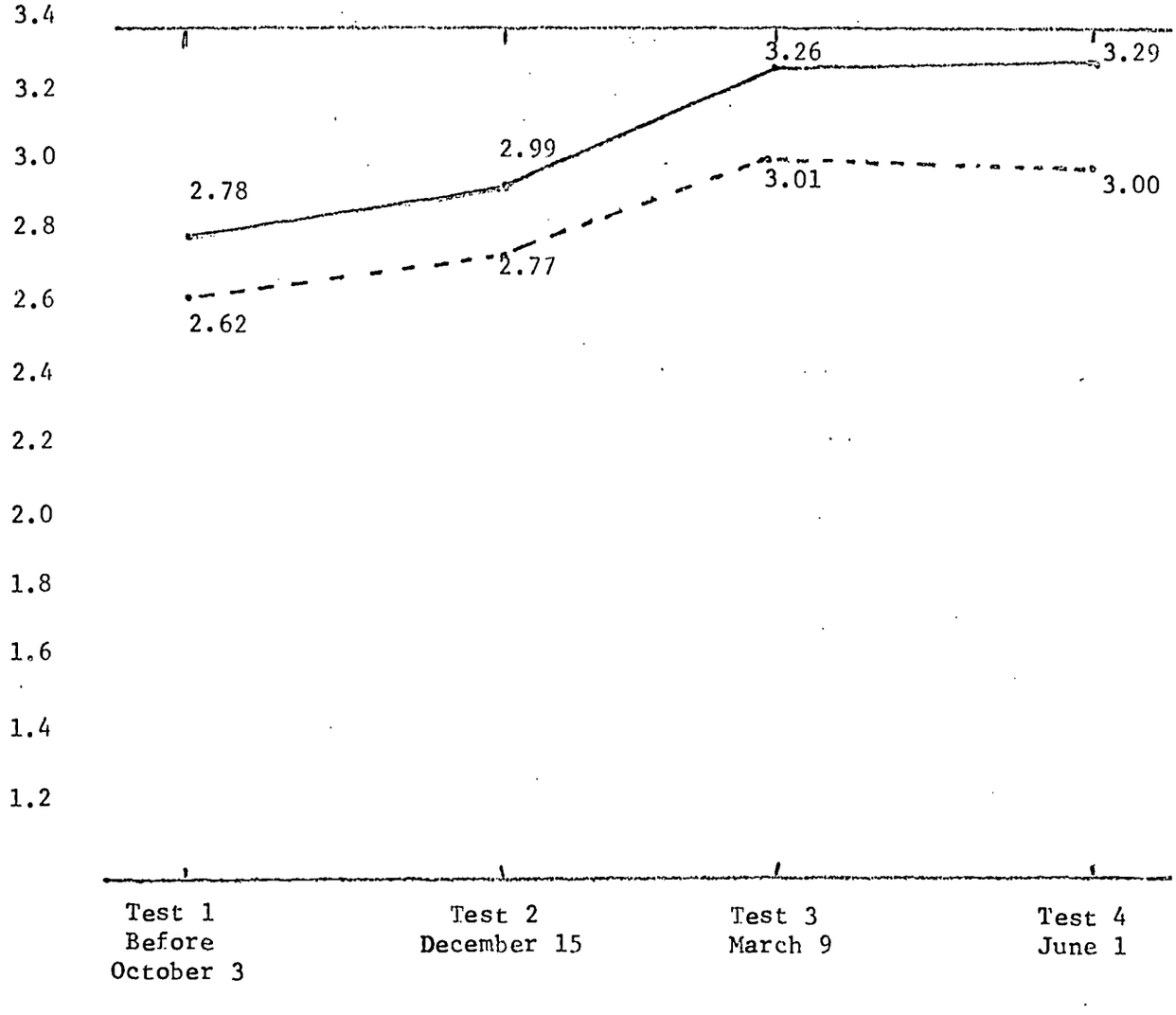
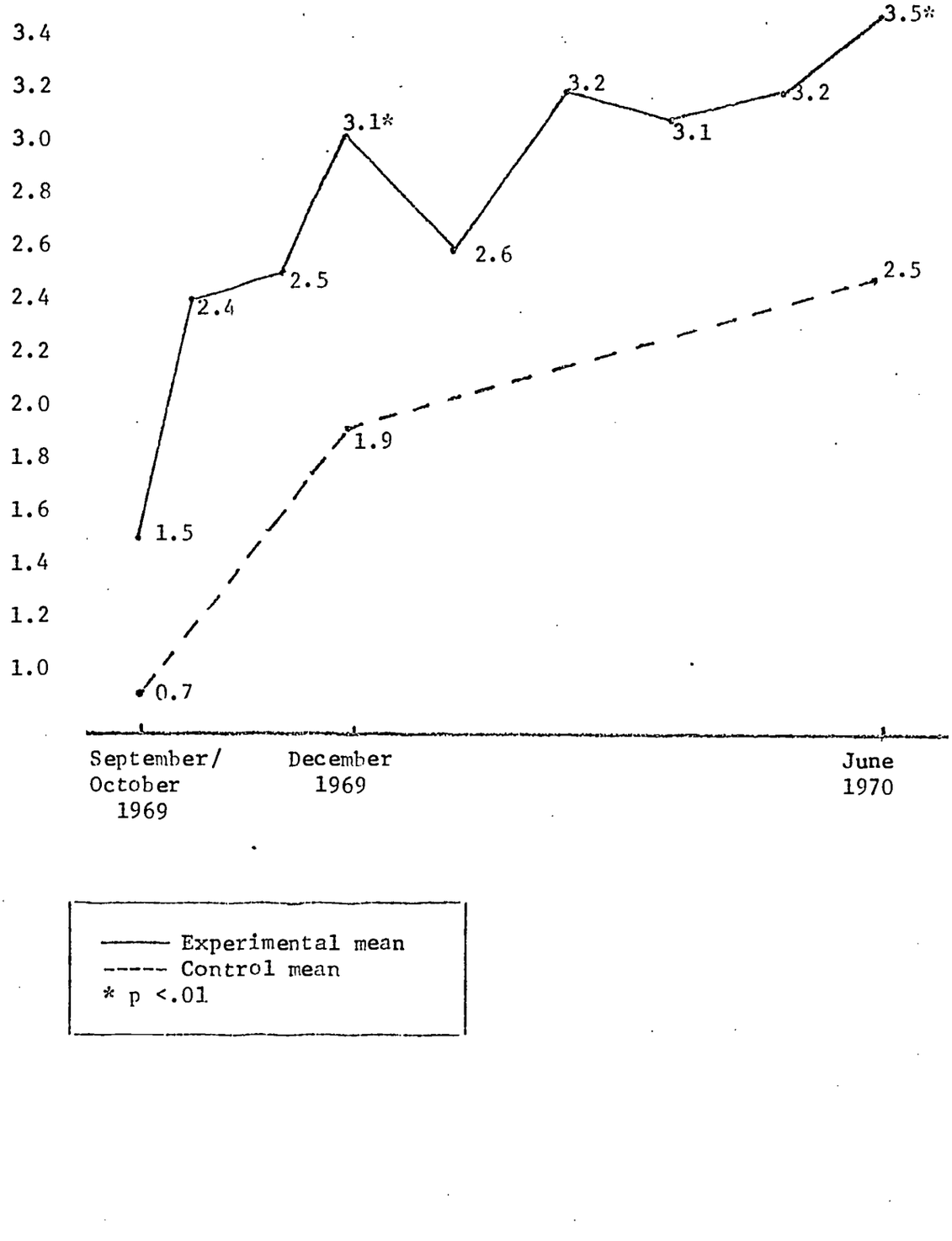


FIGURE 5

MEAN GRADE EQUIVALENT SCORES ON
INDIVIDUAL READING INVENTORY



pupils and the effects of practice in taking the IRI. It is not possible to analyze the separate contribution of learning and practice to the IRI scores in this program.

Iowa Tests of Basic Skills. In the Philadelphia public schools, all elementary students in grades 3 through 8 are tested annually on the Iowa Tests of Basic Skills. The results of the sample on the subtests of the ITBS administered in May 1969 and in May 1970 are presented in Table 4. The pattern of growth across the subtests is almost identical to that obtained on the MAT, in which the experimental students showed their greatest growth in Vocabulary and Reading, and made smaller gains with each subsequent administration of the test. The greatest gain on the ITBS by the experimental group was in the Reading subtest (7.4 months). However, although the gain is striking considering the original, low scores in 1969, and although the control group gained only 1 month in the year, the growth of the experimental group remains less than a year's worth. It is possible that the largest part of the gain on the skills measured by the ITBS took place by December, as it apparently did on the MAT and the IRI.

Discussion of Program Components

Three program components are discussed in this section: personnel, materials, and pupil persistency. Included in the discussion are procedures used, problems encountered and solutions tried, estimates of the effectiveness of the procedures, and recommendations for future studies of this type.

Personnel

The small ratio of teachers to pupils was considered an advantage of the program. It could be used in future programs where two or three student teachers would work with a regular teacher in a normal classroom. The small ratio is essentially free to the school system, as student teachers customarily are not paid.

One risk in using student teachers is that they may lack some skills required to teach remedial reading. It may not be realistic to plan on-the-job training in these skills as a major element of an experimental program, because much of the energy of the rest of the staff may be needed to solve unforseen problems.

A second risk is that freedom to halt instruction for evaluating, planning, and/or seeking or producing more appropriate materials may be restricted because the student teachers are required (or want) to spend a minimum amount of time teaching a minimum number of pupils. In this project several options, such as delaying the start of the program until all materials were ready, and reducing the number of students in the program because of problems in developing pupil persistency, were not available because we were obligated to provide a certain amount of teaching experience for the student teachers.

TABLE 4

MEAN GRADE-EQUIVALENT SCORES ON IOWA TESTS

Test and Date		Experimental Group			Control Group		
		Mean	S.D.	Sample	Mean	S.D.	Sample
Vocabulary	May 1969	2.19	.52	14	1.93	.63	18
	May 1970	2.89	.76	16	2.49	.57	20
Reading	May 1969	2.08	.53	14	2.23	.34	17
	May 1970	2.82	.68	16	2.35	.60	20
Language Arts Total	May 1969	2.25	.49	14	2.38	.48	17
	May 1970	2.89	.77	16	2.68	.12	19
Arithmetic Total	May 1969	2.47	.47	12	2.36	.41	18
	May 1970	3.06	.54	15	2.76	.12	19

Materials

SRA Reading Laboratory Cards. The materials upon which the program was based were the Reading Laboratories Ia, Ib, and IIa, published by Science Research Associates. These materials were selected because (1) the materials were unfamiliar to the pupils, (2) each lesson (card) represents a short term goal, and (3) the number of selections at each reading level allows each pupil some choice of reading matter. The Laboratories are boxes containing color coded, graded cards, each with a reading passage and pictures, comprehension questions, and exercises in word analysis and vocabulary development. Pupils wrote answers on dittoed sheets (disposable workbooks are available from the publisher) and corrected their work by referring to separate answer keys. The teachers supervised the pupils in order to check accuracy and honesty and to help when pupils had difficulties.

The range of grade levels and numbers of cards per level of the SRA Reading Laboratories are indicated in Figure 6. All pupils were assigned to start work on level 1.2 in Lab Ia, below their initial achievement level on the Metropolitan Achievement Tests, so that they would have a feeling of success in reading from the beginning of the program. Three cards per day were assigned to each pupil during the first cycle, and one to two cards per day during the second and third cycles.

Supplementary materials. A variety of materials was selected and developed to supplement the SRA cards because the SRA Reading Laboratories were not designed as a complete or remedial program. The materials described below were assigned to the pupils in varying proportions throughout the program. The amount of supplementary work assigned each day varied with the pupils' working rates; in the first cycle, pupils worked on the SRA cards 90-105 minutes, and on the supplementary materials 45-60 minutes. During the second and third cycles, pupils worked 20-30 minutes on the SRA cards and 20-30 minutes on supplementary materials. The probable effects upon reading skills of the materials in the program are discussed above in the section on Overall Results and Discussion, and below in the paragraphs on Effectiveness of the materials.

The Basic Reading Skills workbooks (SRA) were used to develop a variety of reading skills, including the use of sight vocabulary and word discrimination. The graded Sullivan McGraw-Hill programed workbooks were used to provide practice in using the phonetically regular vocabulary in the Basic Reading Skills workbooks.

Word analysis activities received greater emphasis than the workbooks. During the first cycle, the staff made booklets of worksheets that paralleled the exercises and vocabulary in the SRA Reading Laboratory cards being used by the pupils. The exercises seemed to be easy for the pupils and gave them additional practice.

By the end of the first cycle, it was apparent from the difficulties pupils had with some exercises on the SRA cards that gaps existed in the

FIGURE 6

SRA READING LABORATORIES USED IN PROGRAM

Laboratory	Year Published	Cards Per Level	Levels														
Ia	1957	20	1.2	1.4	1.7	2.0	2.3	2.6	3.0								
Ib	1957	20		1.4	1.7	2.0	2.3	2.6	3.0	3.5	4.0						
IIa	1969	15				2.0		2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0		7.0

pupils' word analysis skills, and so the staff compiled specifically focused Word Analysis Units from commercially available duplicating masters. The Units were on compound words, contractions, suffixes, and syllabication. After completing each 10 to 20 page Unit with instruction by the teachers, the pupils took a group test modeled on the MAT format; achievement on the Unit tests was generally high. Work on the Units spanned the second and third cycles.

One other supplement to the SRA Reading Laboratory cards was the "Concept Cards" created by the teachers. An index card with key words and definitions was attached to each SRA card beginning at the 2.5 level; the cards were developed to help the pupils complete difficult exercises in vocabulary. The Concept Cards were considered to be reference materials, like a brief dictionary, that would help the pupils to do more of the work independently.

To give pupils practice in making inferences from reading, the Reading for Understanding (Junior) Laboratory (SRA) was introduced. Each card in the Lab contains 10 sentences requiring an inferential selection of a word or phrase for completion. The sentences were too difficult for most pupils to read independently until late in the year, but half a dozen pupils completed several cards in the Lab.

A variety of reading games and a small library were made available to pupils who finished their assigned work or came to the Center voluntarily after school, as several did. An average of 10 minutes daily for games and leisure reading was used throughout the second and third cycles.

Practice in test taking. So that gains in reading skills would not be obscured by pupils' unfamiliarity with the test format, practice was provided in taking tests modeled on the Metropolitan Achievement Tests, the criterion instrument for the program. The content included concepts from the Word Analysis Units described above, and items from forms of the MAT already used for evaluation of the program. No teacher saw the items on any form of the MAT before it was administered; it was ascertained that no item in previously administered forms of the test was repeated on forms used subsequently.

Effectiveness of the materials. The SRA Reading Laboratory materials were not equally effective with all the pupils. Ten pupils worked steadily throughout the program and completed the Ia Lab and the top two or three levels of the Ib Lab, and three of these pupils did some work in the IIa Lab. But the six other pupils in the experimental group had to work on the same levels in both the Ia and Ib Labs (a total of 40 cards per level) before they could move to the next higher levels and work competently; these six never did complete either the Ia or Ib Lab.

The ten pupils for whom the SRA Labs (with supplementary work) apparently provided appropriate ease and success in learning to read, completed a mean of 188 SRA Reading Laboratory cards in the 140 days of the program. The mean grade level they achieved on the SRA cards was 3.5. Unfortunately, the amount of work accomplished was insufficient for total remediation of the reading deficiencies.

The SRA cards became difficult for most pupils beginning with the second level (1.4), where the stories were longer than they had been on the 1.2 level, and where consequently more sight vocabulary was required for successful reading. Supplementary work facilitated the work on the SRA cards for the ten more able pupils; the ten needed encouragement to persist subsequently while they made transitions to new reading levels in the Labs, and when they encountered new types of exercises. The other six pupils had more difficulty with the work.

The six pupils who worked slower and more erratically than their ten more successful classmates did have an effect on the progress of the whole group. Distractions tended to be infectious, involving several pupils at a time, regardless of their working levels or reading competence. Alternative materials and procedures were introduced as difficulties arose; nevertheless, the less successful pupils were not separated from the group for special assistance beyond what the teachers could provide during the regular instructional sessions. (See the discussion of solutions to problems in the section below on Problems with Persistency.)

It was soon learned that a single series of materials is insufficient to remediate severe reading deficiencies. A commercially available, comprehensive series including reading selections and exercises can be used as a base, but supplementary materials have two uses. The first is to provide the pupils with practice of skills they may have difficulty learning. The second use is to facilitate transitions from one level of work in the basic series to the next level; the transitions may be made more easily if reference materials like the Concept Cards are used, and if supplementary materials are used for practice of the new skills encountered on the higher level. To be effective, a long term project probably requires a variety of short range materials from which the teachers can select appropriate ones for the pupils at particular times.

A test of the relative effectiveness of combinations of various materials remains for a future study. It is probable that all the combinations of materials used in the current program were equally effective for the ten achieving pupils and were less effective for the other six; it is probable, too, that all pupils would have achieved larger overall gains with more time on task.

Problems with Persistency

Throughout the program we were unable to help all the pupils work persistently and independently. It was anticipated that the pupils would need training in attending to the reading activities, and so at the beginning of the program, we introduced simple rules of conduct in the Center and a system of behavior modification with tangible reinforcers (points which could be exchanged for candy and toys). These two procedures helped orient the pupils to the program, but they did not control the pupils' difficulties in persisting.

Some probable causes of the pupils' inability to persist in their work are these: (1) acoustics in the room were poor--even normal

conversation was amplified and distorted; (2) although supplementary materials were at appropriate instructional levels for the pupils, the SRA Reading Laboratory cards always were the most prestigious materials in the Center, and so some of the less able pupils did not want to work on supplementary materials, but wanted the SRA cards, which were difficult and frustrating; (3) all 24 pupils started the program on the same day, and were expected to work on reading almost continuously for two hours or more daily from the first day; (4) after reducing the length of the sessions and finding that some pupils could not persist for even one hour, we were unable to schedule extra sessions for these pupils; (5) sufficient time was lacking to plan alternative procedures and to train the student teachers in them; (6) the tangible reinforcement system may have been discontinued too early, at the end of the first cycle; (7) we fulfilled the requests of the homeroom teachers and the principal in an attempt to cooperate and serve rather than insisting that our requests for schedule changes during the second and third cycles be given first consideration.

Our attempts to assist the pupils in persistency included these procedures in various combinations:

1. the length of the sessions was reduced in January with the hope of capitalizing on the pupils' ability to persist during the first hour of the original, longer sessions--unfortunately, for 18 of the 24 pupils the new session was scheduled between recess and lunch, a poor period for persistency in any schoolwork;

2. supplementary work was introduced to provide practice on levels where the pupils were experiencing success and to close gaps in pupils' skills;

3. the quantities and types of work assigned and completed were recorded and analyzed so that modifications in the assignments could be made to maximize persistency;

4. the size of the groups was reduced so that more teacher assistance would be available, and fewer distractions by classmates would occur;

5. social reinforcement was applied in large doses, and the rules of conduct in the Center were reiterated;

6. baffles were arranged between teaching areas to reduce noise and to discourage interactions except with the reading materials.

None of these procedures noticeably ameliorated the problem. An estimate of the amount of persistency was obtained during three sessions in the third cycle by having an outside observer use a classroom interaction system; his data indicated that pupils spent an average of 60-70% of their time on task.

Our recommendations to planners of future projects are offered hesitantly, because of our lack of success in solving the problem of persistency, but the recommendations are these: (1) start the program with brief working periods that are gradually lengthened; (2) provide tangible reinforcers until it is certain that pupils are experiencing success from the act of reading; (3) keep arrangements flexible to avoid being locked into instructional procedures or schedules that may hinder or be ineffective in improving the reading skills of the target pupils; (4) plan to teach one group of pupils for four weeks or so as a trial run, and then to begin again with the actual program--there may be no substitute for experience with all the variables of a particular situation.