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A Study of the Effectiveness of Various Methods of Teaching Reading in Special Education Classrooms

Mary Ann Fisher
Central Washington University

A STUDY OF THE EFFECTIVENESS OF VARIOUS METHODS OF TEACHING READING IN SPECIAL EDUCATION CLASSROOMS

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Mary Ann Fisher

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APPROVED FOR THE GRADUATE FACULTY

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Dohn A. Miller, COMMITTEE CHAIRMAN

_____

Jerry DiMinico

_____

Sam Rust Jr.

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CHAPTER I

THE PROBLEM AND DEFINITION OF TERMS

As the responsibilities of the schools continue to grow, there are wide variances in the intensity and emphasis given to different areas of learning. The top priority continues, however, to be in the field of reading. It has been stated time and again, that in order to succeed in today's society, the acquisition of the fundamental skills of reading is necessary (10:ix).

However, acknowledging that these skills are important and seeing that they are successfully mastered are two different things. It is unfortunate that 11% of the population of the United States could not read according to a study by Gray in 1956 (12:3). A publication of the National Reading Council in 1970 reported that seven to eight million school children could not read well enough to make full progress in school, and that five million young job seekers were not functionally literate in America today (22).

With the introduction of "Sputnik" and the publication of the book, Why Johnny Can't Read by Rudolf Flesch, public attention was focused on the American schools and their methods of reading instruction. At the present time, more emphasis is being placed on the reading process and in many cases supplementary and special classes have been initiated.

I. THE PROBLEM

Statement of the Problem

Research is continually being carried out to provide us with a better understanding of the process of reading itself and of how children come to acquire this skill. Olson (23:13-14) states:

> Never before has there been such a profusion of materials for teaching reading. With the advent of the "space race" and the resulting emphasis upon education, the public has placed the entire educational system under careful scrutiny. Since reading skills are the key to knowledge, it is obvious why the public has such an interest in the way reading is taught and the outcomes of progress in that field . . . . The reading controversy centers, not on any claim that we are not teaching the reading skills, but on the question of how we can teach the reading skills so that more children will be able to find success in school.

In an attempt to facilitate the teaching of reading, many new programs have been designed. The value of one program over another has been questioned.

Purpose of the Study

The purpose of this study was to compare the effect of two reading programs, Sullivan's Programmed Reading and the Psycholinguistic Color System, and to try to determine if one program did, in effect, have a particular value over the other when used with children in an intermediate special education program.

A secondary purpose of the study was to determine if a teacher-centered program brought about different results than one which was student-centered.

II. DEFINITION OF TERMS

For the purpose of this study the following terms have been defined.

Intermediate Special Education Class

Children included in this class are functioning at the educably mentally retarded level, meaning that they score at an IQ below eighty and their accomplishment is at least two years retarded for their age and grade placement. These children range in age from nine to fifteen years.

Teacher-Centered Program

A teacher-centered program is one which is developed in such a way as to rely principally on instruction from the teacher in order for the child to progress normally through the program. The Psycholinguistic Color System will be considered a teacher-centered program in this study.

Student-Centered Program

A program in which the student can progress individually, at his own rate, without the continual assistance of the teacher will be considered a student-centered program. The program being used for this study will be Sullivan's Programmed Reading.

III. LIMITATIONS OF THE STUDY

The study was limited by factors of sample size, the

teachers' enthusiasm and experience, and the variability of the control group.

Sample Size

This study was limited to the extent of the sample groups. The classes using specific programs were not necessarily comparable on matters such as socioeconomic background, interest, cultural background, etc. Their selection was based on the fact that they were members of the intermediate special education program and had been admitted on the basis of an IQ score of less than eighty. They ranged in age from nine to fifteen years.

The class sizes were also quite small, averaging about eleven students per class. Added to the already small sample was the problem of losing students during the school year which decreased the sample even more.

Teacher Related Factors

There were several factors relating to the teachers which limited the study. The number of years of teaching experience was varied. The two teachers using Sullivan's Programmed Reading had had prior experience in using the program. The teacher's enthusiasm for the program being used was not always the same. Also, the amount of class time the teacher actually spent using the program differed from teacher to teacher and from program to program. In addition to these, the personality and competence of the teacher could not be measured and held constant.

Control Groups

The variability of the control group was an added limitation of the study. In two of the classes used as the control, there was a teacher change during the year which made continuity in the program being used difficult. Also, the teachers were permitted to use a reading instruction method of their own choice, so there was little uniformity between the two classes used as the control group in regard to the method of instruction used.

IV. ORGANIZATION OF THE REMAINDER OF THE STUDY

The remainder of the study will enlarge upon the following material:

Chapter II contains a review of the literature concerning studies done examining specific approaches to the teaching of reading, and the effect of the teacher on particular programs. It is divided into the following sections: research related to Programmed Reading, research related to the Psycholinguistic Color System, the teacher factor, and a summary.

Chapter III deals with the method and procedure used in the study. It includes: the sample population, the test used, a description of the programs used, and the procedure followed in undertaking the study.

Chapter IV contains the presentation of the data and results of the study.

Chapter V states the summary, conclusions, and recommendations for future study.

CHAPTER II

REVIEW OF THE LITERATURE

Many new approaches have been developed over the past few years in an attempt to improve our task of teaching reading. These approaches include everything from the revision of our standard basal reading programs to the development of entirely new techniques. A beginning teaching alphabet has been devised (5:211), color-coding has been used in an attempt to teach letter-sound correspondences (16:40), and linguistics (14:78) and phonics (26:615) have again been incorporated in the teaching of reading. Many of these seem to be outgrowths of serious study of the reading process.

In studying the psychology of reading, Levin (21:155) has stated that there are two broad divisions in learning to read. The first is learning the code, the second is learning how to use the code. In teaching reading, then, he feels there is a four-fold need:

1. We need a more extensive spelling-to-sound mapping, directed toward showing the regularities.

2. We need to teach children an order of application for the many rules in the English language.

3. We need a method of marking instances so that they will correspond to the rule.

4. We need explications of the rules (21:162).

Today, many of these points have been considered and incorporated in reading programs. Now our task is to evaluate some of these techniques to determine if they do, in fact, teach children to read more effectively. Many research studies have been and continue to be carried out throughout the nation toward this end.

To date, one of the most comprehensive studies was one done by Jeanne Chall and published in her book, Learning to Read: The Great Debate. The study was concerned primarily with a critical analysis of existing research, comparing different approaches of beginning reading (6:5). Her conclusion was that a "code" emphasis is superior to a "meaning" emphasis. "Code" emphasis referred to a program, such as Programmed Reading and Psycholinguistic Color System, which combined control of words on spelling regularity, some direct teaching of letter-sound correspondences, and the use of writing, tracing, or typing. Most conventional basal-reading series emphasize the "meaning" emphasis (6:178-79).

Chall's findings were supported by Robert Dykstra in an article published in The Reading Teacher (11:17), based on a research project coordinated by Dykstra and Bond. In this project, "A Cooperative Research Program in First-Grade Instruction," twenty-seven projects were selected on the basis of their individual merit as self-contained studies, and the findings were coordinated at a center established at the University of Minnesota. Experimental procedures and data collection were uniform for the twenty-seven projects (4:3).

Although Bond and Dykstra did report that reading instructional techniques did appear to be more effective when a "code" emphasis was employed, they did not find any specific method superior. They concluded:

> No one approach is so distinctly better in all situations and respects than the others that it should be considered the one best method and the one to be used exclusively (4:211).

I. RESEARCH RELATED TO PROGRAMS

Programmed Reading

In both Chall's and Bond and Dykstra's studies, Sullivan's Programmed Reading was one of the programs investigated. Since the publication of this programmed approach to the teaching of reading, its use has been the subject of much research. Generally, it has proven to be a successful tool in the teaching of reading. In a study done in Salt Lake City comparing the Sullivan program with the currently used basal reader, the experimental group was found to yield achievement gains equal to or greater than the basal group on measures of vocabulary and comprehension. The program was found to affect positively the number of words used in original writing although it had no significant effect on sentence complexity (8:38).

In "The Denver Studies" (9:3-4) a similar result was reported. Students using Programmed Reading did significantly better than those in the control group in word knowledge, word discrimination, and reading comprehension at the completion of one year of instruction.

In an evaluation done at Rhoads Elementary School (24:2-5), a higher percentage of children were reading at or above their grade book level than their counterparts in a control group at the end of the third year of study. However, the opposite was found to exist at the end of the second year of the program, leading one to believe that a continued use of the program would be necessary to adequately evaluate its usefulness.

These studies, although somewhat varied in their findings, tend to support the programmed approach to the teaching of reading. At the Third International Reading Symposium, held in London in 1968, this approach was discussed by Robert Bainbridge who stated:

> Among the promising developments in education which assist both the teacher and the pupil, Programmed Reading deserves earnest consideration as an important facet of your language development programs in the demanding years ahead for our profession (1:145).

Psycholinguistic Color System

Very little research has been found on the Psycholinguistic Color System due to its recent publication (1970). It has been developed over a four-year period and has been used with many children, but the previous unpublished versions of it have been hand produced, so any broad scale use has been seriously curtailed (2:12). Its claim to authenticity lies in the fundamental theoretical task analysis of the elements of language processing and its visual and auditory-vocal coding systems. It is the result of an extensive study of the basic nature of the linguistic functioning (2:13).

Although the particular program has not been researched, these fundamentals on which it was designed have been the topic of experimentation in recent years. At the Third International Reading Symposium (1968), both the topics of psycholinguistics and the use of color in teaching reading were discussed. In a speech given at the symposium, Martin Harborth reported that ". . . studies have shown that visual and auditory discrimination are potent factors in reading ability" (17:150). He further stated that these factors were present in the psycholinguistic approach to the teaching of reading, where these were needed to stimulate areas of auditory, visual, vocal, and motor skills (17:163).

A program similar to the Psycholinguistic Color System in its use of color, Colour Story Reading, was presented at the symposium by J. Kenneth Jones as an effective way of teaching reading. He stated that the combination of color and shape provided more information to the beginning reader than shape alone, and had produced scores 300% better in color tests as compared to tests printed in black and administered to children learning to read by both the "color" and traditional methods (20:95).

II. TEACHER FACTOR

Although research being compiled on various approaches to the teaching of reading are often inconsistent and inconclusive in their findings, one factor seems to remain constant.

The teacher appears to be perhaps the most important variable in any particular program.

Harris (18:196) has reported that:

> Research has shown that teachers in the same community, using the same reading materials and supposedly the same methodology with similar pupils, can come out with widely varying class results.

A similar statement was made by Stauffer (25:389):

> Every study has shown that the single most important factor contributing to the success of a particular plan is the teacher . . . . Over and over again we are told that it is the teacher who makes the difference between effective and ineffective learning.

At the conclusion of the CRAFT Project, an investigation on the progress of reading of disadvantaged urban Negro children, Harris and Morrison (19:335) found that differences in class mean reading scores with a particular method were much larger than differences between the means for the approaches and methods. They concluded by stating, "The results of the study have indicated that the teacher is far more important than the method" (19:339).

In the studies done by Chall (6:217) and Bond and Dykstra (4:213), the single most significant finding was that the teacher was the most important element in the learning situation. In their conclusions, Bond and Dykstra (4:211) stated:

> Future research might well center on teacher and learning situation characteristics . . . . The tremendous range among classrooms within any method points out the importance of elements in the learning situation over and above the methods employed. To improve reading instruction, it is necessary to train

> better teachers of reading rather than to expect a panacea in the form of materials.

In Washington D. C., the Office of Education also took a look at teacher influence on pupil achievement. A select group of educational researchers were asked to prepare papers which served as a basis for discussions during a day-long conference in February, 1970. While the research was considered to be still primitive, tentative indicators were held to be emerging. One of the indications was expressed by Don Davis, Associate Commissioner:

> . . . it is clear that teachers are the single most important element in the school--more important than the quality of facilities, the quantity of equipment and materials, or the level of financing (7:iv).

If the teacher is as important as appears to be supported by this research, than one of two considerations can be studied. Either research efforts should be directed toward teacher education rather than specific reading programs, or a program minimizing the need of the teacher should be developed more carefully to compensate for the individual differences found among teachers.

An attempt to minimize the teacher variable and to determine if a student-centered program is as valuable as one guided by a teacher is part of the present study through the use of Programmed Reading.

III. SUMMARY

Research comparing different approaches of reading instruction tends to support a superiority of a "code"

emphasis, such as is found in Programmed Reading and the Psycholinguistic Color System. This approach combines control of words on spelling regularity, some direct teaching of letter-sound correspondences, and the use of writing, tracing, or typing (6:178-79).

However, studies do not tend to support one particular program to the exclusion of all others as being distinctly better in all situations. The only over-all factor which appears consistently is that the teacher is probably the single most important element in any learning situation.

CHAPTER III

METHOD AND PROCEDURE

I. THE SAMPLE POPULATION

The population involved in this study included students in the intermediate special education program of the Yakima County school districts. Students selected for these classes were tested by the school psychologists and found to be functioning at the educable mental retarded level, meaning that they scored at an IQ level below eighty. Their accomplishments in reading, writing, and arithmetic skills were at least two years retarded for their age and grade placement. In these classes, there were a few emotionally disturbed and/or brain damaged individuals. In each case, their academic and general functioning level was similar to that of children whose IQ's are below eighty. The chronological ages of the children were between nine and fifteen years.

Six classes were used in the study. Of these, two were assigned to Sullivan's Programmed Reading, two were assigned to the Psycholinguistic Color System, and the remaining two were used as the control group, in which the teachers were permitted to use a reading instruction method of their own choice.

The teachers assigned to Sullivan's Programmed Reading both had prior experience with the program and had requested preference for this particular program for the study. Their requests were honored.

The teachers using the Psycholinguistic Color System and those functioning as the control group were assigned programs on a random basis.

II. TEST USED

In designing the study, the Gates-MacGinitie Reading Test was chosen to provide scores for comparing the groups in vocabulary and comprehension skills at the beginning and end of the school year. In September, 1970, all students involved in the study were tested using this instrument. The instrument was selected by the psychologists of the school districts on the basis of their experience with it. In May, 1971, the children were again tested in the Gates-MacGinitie Reading Test, using an appropriate form. A description of the test follows.

Gates-MacGinitie Reading Test

The Primary A level, intended for use in the first grade and the Primary B level, intended for use in the second grade were used for this study. The range of achievement of the special education students made the administering of both test levels necessary. Both levels consisted of two parts: vocabulary and comprehension.

The vocabulary sections sampled the child's ability to recognize or analyze isolated words. They consisted of forty-eight exercises, each of which contained four printed words and a picture illustrating the meaning of one of the words. The beginning exercises were relatively easy, gradually becoming harder as the test progressed.

The comprehension sections measured the child's ability to read and understand whole sentences and paragraphs. The tests contained thirty-four passages of increasing length and difficulty. Each passage was accompanied by a panel of four pictures. The child was to mark the picture that best illustrated the meaning of the passage or that answered the question in the passage.

The norms for the Gates-MacGinitie Reading Tests were based on nationwide standardization. The communities participating in the standardization were carefully selected on the basis of geographic location, size, and socioeconomic level in order to assure a representative sample of pupils at all grade levels (15:1).

III. PROGRAMS USED

Since the children in these classes were lacking in reading skills, much of the curriculum and day were devoted to the teaching of reading, and several approaches and methods were used in all classrooms. For the purpose of this study, the experimental classes added either Sullivan's Programmed Reading or the Psycholinguistic Color System to

their normal curriculum. A description of each of these programs follows.

Programmed Reading

Two of the classes in the study included the use of Programmed Reading for the school year, 1970-71. This program was written by M. W. Sullivan and Cynthia D. Buchanan and published by the Webster Division of the McGraw-Hill Book Company. The series consists of programmed workbooks, supplementary readers, filmstrips, word cards, and duplicating masters for supplementary exercises.

The program employs the characteristics of a "linear" program. This refers to carefully organized material which is presented in short sequential steps, each requiring a response. After each response, the pupil learns if his answer was correct. The program is written to assure a very high probability that responses will be correct, thus the child is likely to be reinforced at each step.

The program also utilizes the principle of correspondence between sound and symbols. All sounds classified as "regular" are taught first. Sight words are held at a minimum. The child learns the structure of words and the structural features of the language. Word patterns, intonation and inflection are also emphasized (13:446). The program is individualized and involves very little instruction by the teacher.

Psycholinguistic Color System

The second experimental group added the Psycholinguistic Color System to their reading program for the 1970-71 school year. This program was written by Alexander Bannatyne and is published by the Learning Systems Press. The program includes wall charts, flash cards, six student workbooks, and color pencil sets.

In the Psycholinguistic Color System, the children are taught a color code to go with specific phomemes which can be used as clues to the correct pronunciation of words. It utilizes the psycholinguistic channels of input and output so that children learn to listen, speak, read, write and spell, thus teaching reading and language skills at the same time (3).

Control Group

No particular reading program was added to the two classes which were used as the control group. Each teacher used several approaches and methods to teach reading. These approaches included:

phonetic materials
teaching of letter sounds
charting of words read per minute
high interest, low vocabulary books
limited use of Sullivan's programmed workbooks
student written materials

Specific structured approaches of a published program were not followed in either of the classes making up the control group.

CHAPTER IV

RESULTS OF THE STUDY

The purpose of this study was to compare the effect of Sullivan's Programmed Reading and the Psycholinguistic Color System when used with children in an intermediate special education program.

In order to compare the groups, the Gates-MacGinitie Reading Test was administered in the fall of 1970 and again in the spring of 1971. The tests produced scores for both vocabulary and comprehension.

The raw scores of the subtests were converted to grade equivalent scores. The differences between the grade equivalent scores were computed. The pre- and post- grade equivalent scores and the computed difference showing the loss or gain for each student is listed in the following tables. Scores are given for both the vocabulary and comprehension sections of the test.

As can be seen from Table I, fourteen of the seventeen students using Programmed Reading made gains in vocabulary and all of the students made gains in comprehension. The mean difference in vocabulary as tested by the Gates-MacGinitie Reading Test showed a gain of seven months. The mean difference in comprehension showed a gain of one year and one month.

TABLE I

PRE- AND POST- GRADE EQUIVALENT SCORES AND MEAN DIFFERENCES FOR PROGRAMMED READING GROUP

Vocabulary			Comprehension		
Pre-Test	Post-Test	Difference	Pre-Test	Post-Test	Difference
--*	1.7	+1.7	--	1.8	+1.8
1.3	2.8	+1.5	--	2.2	+2.2
1.5	3.2	+1.7	1.4	1.6	+ .2
3.3	4.8	+1.5	3.7	4.9	+1.2
2.5	3.5	+1.0	2.8	4.3	+1.5
2.5	3.5	+1.0	3.0	4.5	+1.5
3.3	3.5	+ .2	2.5	3.6	+1.1
1.4	1.5	+ .1	1.3	1.5	+ .2
3.3	3.7	+ .4	3.4	4.0	+ .6
1.4	1.3	- .1	--	1.3	+1.3
2.2	2.8	+ .6	2.4	3.4	+1.0
--	1.3	+1.3	--	1.4	+1.4
1.4	1.3	- .1	--	1.5	+1.5
1.3	1.7	+ .4	--	1.6	+1.6
--	1.3	+1.3	--	1.2	+1.2
2.1	2.6	+ .5	1.5	2.2	+ .7
2.7	2.4	- .3	2.3	2.7	+ .4
Mean difference + .7			Mean difference +1.1		

*Indicates raw score too low to record

TABLE II

PRE- AND POST- GRADE EQUIVALENT SCORES AND MEAN DIFFERENCES FOR PSYCHOLINGUISTIC COLOR SYSTEM GROUP

Vocabulary			Comprehension		
Pre-Test	Post-Test	Differences	Pre-Test	Post-Test	Differences
1.6	2.4	+ .8	1.6	1.6	--
3.3	3.0	- .3	2.5	3.0	+ .5
2.4	2.7	+ .3	1.7	2.2	+ .5
2.3	2.8	+ .5	1.7	2.1	+ .4
1.9	2.1	+ .2	1.9	1.9	--
2.0	1.7	- .3	1.7	1.9	+ .2
1.3	1.3	--*	1.5	1.4	- .1
--	--	--	1.3	--	-1.3
2.4	3.0	+ .6	2.2	2.1	- .1
1.9	3.2	+1.3	1.7	1.9	+ .2
1.6	1.8	+ .2	1.4	1.7	+ .3
1.6	1.7	+ .1	1.5	1.6	+ .1
1.3	1.6	+ .3	1.5	1.5	--
1.4	1.7	+ .3	1.5	1.7	+ .2
1.6	1.7	+ .1	2.1	2.3	+ .2
1.4	1.5	+ .1	1.4	1.6	+ .2
1.3	1.4	+ .1	1.4	1.5	+ .1
2.0	2.8	+ .8	1.7	2.1	+ .4
1.3	--	-1.3	1.3	1.2	- .1
1.5	1.9	+ .4	1.7	2.1	+ .4
Mean difference + .2			Mean difference + .1		

* Indicates raw score too low to record

TABLE III

PRE- AND POST- GRADE EQUIVALENT SCORES AND MEAN DIFFERENCES FOR CONTROL GROUP

Vocabulary			Comprehension		
Pre-Test	Post-Test	Differences	Pre-Test	Post-Test	Differences
1.7	2.5	+ .8	1.3	2.1	+ .8
--*	--	--	1.3	1.3	--
--	--	--	1.3	1.2	- .1
1.7	1.9	+ .2	1.4	1.8	+ .4
2.7	1.7	-1.0	1.6	2.0	+ .4
1.7	2.4	+ .7	1.6	2.7	+1.1
1.4	1.6	+ .2	1.4	1.6	+ .2
2.5	1.5	-1.0	1.9	1.5	- .4
2.7	2.8	+ .1	2.1	2.3	+ .2
--	1.7	+1.7	1.3	1.9	+ .6
--	1.6	+1.6	--	1.5	+1.5
1.4	1.6	+ .2	1.2	2.1	+ .9
1.7	2.3	+ .6	1.7	2.5	+ .8
1.6	3.0	+1.4	1.3	2.2	+ .9
1.7	2.1	+ .4	2.0	1.9	- .1
2.2	3.2	+1.0	1.7	3.4	+1.7
1.4	1.7	+ .3	1.6	2.0	+ .4
--	1.6	+1.6	--	2.0	+2.0
--	2.0	+2.0	1.2	1.6	+ .4
Mean difference + .6			Mean difference + .6		

*Indicates raw score too low to record

Fifteen of the twenty students who used the Psycholinguistic Color System made gains in vocabulary. The mean difference for the group showed a gain of two months. Thirteen of the twenty students made gains on the comprehension scores. The mean difference for this group was a gain of one month. The grade equivalent scores for this group are listed in Table II.

The grade equivalent scores for the Control group are listed in Table III. Looking at the differences between the pre- and post- tests, it can be seen that fifteen of the nineteen students in this group showed gains in both vocabulary and comprehension. The mean difference in each was a gain of six months.

TABLE IV

NUMBER AND PERCENTAGE OF STUDENTS WHO MADE GAINS ON GATES-MACGINITIE READING TEST

Group	Vocabulary		Comprehension	
	Number	Percentage	Number	Percentage
Programmed Reading	14 of 17	82.00	17 of 17	100.00
Psycholinguistic Color System	15 of 20	75.00	13 of 20	65.00
Control	15 of 19	79.00	15 of 19	79.00

An examination of the results of the testing showed the greatest gains in vocabulary and comprehension for the group using Programmed Reading. The Control group made slightly higher gains than the group using the Psycholinguistic Color System in both subjects. Table IV includes the percentage and number of students from each group who made gains. The percentages are given for both vocabulary and comprehension subtests.

A factor which may have influenced these results was the computation of the grade equivalent scores from the raw data. The minimum grade equivalent score listed for the vocabulary section of the test was 1.3. If the student scored less than fifteen questions correct on this section of the test, he received no grade equivalent score. On the post-test, were he to score fifteen, his grade equivalent score would be computed as 1.3, showing a difference of one year and three months. It could conceivably have been a much slighter gain than the data showed. In computing the gains in the comprehension subtest, the same problem was found to exist.

Also, in this study, the experimental programs were added to the reading programs regularly used in the classrooms. It is possible that gains made in any of the groups may have been influenced by the regular reading programs used in the classes.

In order to determine if the results computed were statistically significant, the t-test for a difference between two independent means was applied.

TABLE V

COMPARISON OF THE MEANS BETWEEN SULLIVAN'S PROGRAMMED READING GROUP AND THE PSYCHOLINGUISTIC COLOR SYSTEM GROUP

	Programmed Reading M	Psycholinguistic Color System M	Difference of Means	t
Vocabulary	.747	.210	.537	2.754*
Comprehension	1.141	.105	1.036	3.149*

*Significant at .01 level

When the group using Programmed Reading and that using the Psycholinguistic Color System were compared, the Programmed Reading group was found to be statistically significant at the .01 level of confidence in both vocabulary and comprehension. The results of the t-test are shown in Table V.

TABLE VI

COMPARISON OF THE MEANS BETWEEN SULLIVAN'S PROGRAMMED READING GROUP AND THE CONTROL GROUP

	Programmed Reading M	Control M	Difference of Means	t
Vocabulary	.747	.568	.179	.696
Comprehension	1.141	.616	.525	2.625*

*Significant at .02 level

A comparison of the Programmed Reading group with the Control group showed the experimental group to be statistically significant at the .02 level of confidence in comprehension. However, no statistically significant difference was found between the means on vocabulary. Table VI illustrates these results.

TABLE VII

COMPARISON OF THE MEANS BETWEEN THE PSYCHOLINGUISTIC COLOR SYSTEM GROUP AND THE CONTROL GROUP

	Psycholinguistic Color System M	Control M	Difference of M	t
Vocabulary	.210	.568	.358	1.613
Comprehension	.105	.616	.511	1.592

In comparing the Psycholinguistic Color System with the Control group, no statistically significant differences were found on either the vocabulary or comprehension subtests. These results may be seen in Table VII.

The results tended to show greater gains in both vocabulary and comprehension in favor of the group using Programmed Reading over those using the Psycholinguistic Color System. However, the Programmed Reading group was not statistically significant over the Control group on measures of vocabulary, although they were statistically significant in

comprehension. Programmed Reading did appear to be superior to the Psycholinguistic Color System as far as the test results were concerned.

It should be noted that the teachers using Programmed Reading had prior experience with the program and had requested preference for this particular program for the study. It is possible that they may have been more familiar with the program and this factor may have influenced the greater gains made by this group.

A secondary purpose of the study was to determine if a teacher-centered program brought about different results than a student-centered program. For the purpose of the study the Psycholinguistic Color System was designed to be a teacher-centered program and Programmed Reading a student-centered program.

Since the group using Programmed Reading made higher scores on the testing, it would appear that a student-centered program produced better results than a teacher-centered program.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

I. SUMMARY

This study was conducted in an attempt to compare Sullivan's Programmed Reading with the Psycholinguistic Color System and to determine whether one program had a particular value over the other when used in an intermediate special education program. Children included in the study were members of the intermediate special education program of the Yakima County school districts and were functioning at the educable mental retarded level.

Six classes were used for the study. Two of these were assigned Programmed Reading for the 1970-71 school year, two were assigned the Psycholinguistic Color System, and the remaining two were used as a Control group, adding no particular reading program to their curriculum.

All students involved in the study were tested in September, 1970, using the Gates-MacGinitie Reading Test. In May, 1971, they were retested using an appropriate form of the same test. A comparison of the grade equivalent scores was made and tested for statistical significance through the use of the t-test. The group using Programmed Reading was found to have made significantly greater gains in vocabulary and comprehension at the .01 level of confidence.

A secondary purpose of the study was to determine if a teacher-centered reading program brought about different results than a student-centered program. In this study, the Psycholinguistic Color System was designed to be a teacher-centered program and Programmed Reading was designed to be a student-centered program. Since the Programmed Reading group made greater gains on the Gates-MacGinitie Reading Test, it appeared that a student-centered program produced better results.

II. CONCLUSIONS

From the results of the present study the following conclusions were drawn.

1. The Sullivan Programmed Reading group resulted in higher gains than the Psycholinguistic Color System when used with students in the intermediate special education program.

2. The findings of this study supported research stating that the individual teacher was an important factor in any reading program. The gains made in the particular classes using the same program were not found to be the same.

3. The gains made by the Programmed Reading group tended to support the superiority of a student-centered program over a teacher-centered program.

III. RECOMMENDATIONS

The data collected in this study pertained to only a

small population with a number of limiting factors. Bearing this in mind, the following recommendations are made:

1. A similar study be conducted using a larger population, controlling more carefully the other reading methods used in the regular curriculum.

2. The study be continued over a longer period of time to ascertain if the long-range results would be similar. In that the students involved in the study were special education students, it was felt that it could take longer for noticeable gains to be made.

3. A study be made in which one teacher would use several approaches to teach reading for a year at a time. Gains made by the students under different methods could be compared to determine if the results were dependent upon the teacher or the program.

4. As a result of this study, the writer would recommend that serious consideration be given to the implementation of a student-centered reading program for intermediate special education students.

BIBLIOGRAPHY

1. Bainbridge, Robert. "The Philosophy, Theory and Practices of Programmed Reading," The Third International Reading Symposium, ed. John Downing and Amy L. Brown. London: Cassell & Company, Ltd., 1968.

2. Bannatyne, Alexander. Psycholinguistic Color System: Teacher's Handbook. Urbana: Learning Systems Press, 1970.

3. Bannatyne Psycholinguistic Color System. "A Meaning-Oriented Program in Reading and Essential Language Skills." Rantoul, Illinois: Learning Systems Press, n.d.

4. Bond, Guy L., and Robert Dykstra. Co-ordinating Center For First-Grade Reading Instruction Programs. Project No. X-001. Minneapolis: University of Minnesota, 1967.

5. Bush, Clifford L. and Mildred H. Huebner. Strategies for Reading in the Elementary School. New York: The MacMillan Company, 1970.

6. Chall, Jeanne. Learning to Read: The Great Debate. New York: McGraw-Hill, Inc., 1967.

7. Coleman, James S. Do Teachers Make A Difference: A Report on Recent Research on Pupil Achievement. ERIC, ED 044 478, 1970.

8. Della-Piana, Gabriel. "Maximizing Effectiveness of Programmed Reading." Reviewed in Kaufman, Maurice. Sullivan Programmed Reading at Burgess Elementary School, Sturbridge, Massachusetts. ERIC, ED 028 908, 1968.

9. "The Denver Studies," A Report of Eight Studies Comparing Programmed Reading with Other Reading Instruction Systems in Grade One and Two. New York: McGraw-Hill, Inc., 1967.

10. Durr, William K. (ed.) Reading Instruction. Boston: Houghton Mifflin Company, 1967.

11. Dykstra, Robert. "The Effectiveness of Code- and Meaning-Emphasis in Beginning Reading Programs," The Reading Teacher, 22:17-23, October, 1968.

12. Eisenberg, Leon. "The Epidemiology of Reading Retardation and a Program for Preventive Intervention," The Disabled Reader, ed. John Money. Baltimore: The John Hopkins Press, 1966.

13. Feldhusen, Hazel J. and others. "Prediction of Reading Achievement Under Programmed and Traditional Instruction," The Reading Teacher, 23:446-454, February, 1970.

14. Fries, Charles C., Agnes C. Fries, Rosemary G. Wilson, and Mildred K. Rudolph. Merrill Linguistic Readers. Columbus, Ohio: Charles E. Merrill Publishing Co., 1966.

15. Gates, Arthur I., and Walter H. MacGinitie. Gates-MacGinitie Reading Test: Teacher's Manual. New York: Teachers College Press, 1965.

16. Gattegno, C. Words in Color: Background and Principles, Chicago: Encyclopaedia Britannica Press Inc., 1962.

17. Harborth, Martin. "Psycholinguistics and Reading Failure," The Third International Reading Symposium, eds. John Downing and Amy L. Brown. London: Cassell & Company, Ltd., 1968.

18. Harris, Albert J. "The Effective Teacher of Reading," The Reading Teacher, 23:195-204, December, 1969.

19. Harris, Albert J., and Coleman Morrison. "The CRAFT Project: A Final Report," The Reading Teacher, 22:335-40, January, 1969.

20. Jones, J. Kenneth. "Phonetic Colour Reading," The Third International Reading Sumposium, eds. John Downing and Amy L. Brown. London: Cassell & Company, Ltd., 1968.

21. Levin, Harry. "The Psychology of Reading," Learning About Learning, ed. Jerome Bruner. Washington D.C.: U.S. Government Printing Office, 1966.

22. National Reading Center. "Right to Read: 1776-1976." Washington, D.C.: The National Reading Center, n.d.

23. Olson, Arthur V. "Reading: The Approaches We Use," Reading Instruction, ed. William K. Durr. Boston: Houghton Mifflin Company, 1967.

24. Scheiner, Louis. An Evaluation of the Sullivan Reading Program, 1967-69, Rhoads Elementary School. ERIC, ED 035 523, 1969.

25. Stauffer, Russell G. "Advice and Consensus," The Reading Teacher, 20:389, February, 1967.

26. Winkley, Carol K. "Why Not An Intensive-Gradual Phonic Approach," The Reading Teacher, 23:611-17, April, 1970.