EFFECTIVENESS OF A READING CLINIC BY LEVELS

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EFFECTIVENESS OF A READING CLINIC BY LEVELS

Dissertation

Presented to the Graduate Council of the North Texas State University in Partial Fulfillment of the Requirements

For the Degree of

DOCTOR OF EDUCATION

By

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Denton, Texas
August, 1966
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CHAPTER I

INTRODUCTION

The chief purpose stated for a remedial reading clinic in a large metropolitan school system is to assist children who are experiencing reading disabilities (3, p. 1). The administrators of this school system, like many other educators throughout the nation, recognize the increasing need for remedial reading instruction. Since the establishment of this system's reading clinic, the number of pupils assigned to the clinic increases steadily each year.

Although general agreement has been reached as to the techniques of diagnosis and remediation that might prove effective in connection with retarded readers, little information is available showing at which grade level the clinic program is most effective. As Mouly and Grant (7, p. 461) point out, the average child reading at grade level is expected to make a gain of one month of reading age per month of usual classroom instruction. An important question, however, is what gain is expected of retarded readers. Bond and Tinker say,

Reports in the literature give ample evidence that well-conceived remedial programs are effective at any grade level. It may be assumed that normal children under average conditions of learning will
gain approximately one grade in reading ability each school year. Instruction in remedial reading should result in gains in reading achievement that are greater than at this rate of one grade per year (1, p.10).

The need for additional evaluation of reading clinic effectiveness is becoming more apparent each year as the number of retarded readers and cost of operation continue to increase rapidly.

Statement of the Problem

The purpose of this study was to identify reading achievement of pupils assigned to the reading clinic and analyze and compare this achievement by grade levels with levels of intelligence. More specifically, the investigation attempted to determine

1. The grade level at which the reading clinic was most effective.
2. The intelligence level at which the reading clinic was most effective.
3. The statistical significance of the variation in group intelligence test IQ's.
4. The correlation between group intelligence test IQ's and total reading achievement.

Definition of Terms

Disabled readers—pupils who have the potential capacity to do better reading but who are retarded as diagnosed by
clinic teachers in their reading at least one year below age
and grade level.

Intelligence Quotient or IQ—the quantitative index of
the subject's performance on the intelligence test as measured
by the Kuhlmann-Anderson Intelligence Test, Sixth Edition, as
compared with other subjects who took the test. All IQ's
used in this study were obtained from the administration of
the Kuhlmann-Anderson Intelligence Test, Sixth Edition. Here-
after, all IQ's will refer to these quantitative indexes
unless otherwise stated.

Levels of intelligence—the arbitrary grouping of the
subjects into high and low groups using the median as the
point of division. The levels were determined by finding the
median of the distribution of IQ's from the first testing for
each grade level.

Reading achievement—the level of achievement in oral
and silent reading as determined by finding the average of
the three oral reading tests and the three parts of Gates
Reading Survey respectively.

Clinic program—the program of instruction as provided
by the reading clinic, separate and apart from the regular
classroom instruction in reading.

Background and Significance of the Study

The Reading Clinic, organized in 1949 after a study was
made by a committee of elementary school principals, has as
its primary purpose to provide assistance to elementary school pupils who have reading disabilities. Bond and Tinker (1, p. 13), along with the authors of the Clinical Reading Handbook (3, p. 13), believe that effective remedial instruction is essentially the same as good individualized classroom teaching. Johnson (6, p. 415) commenting on the fact that much has been done to improve classroom reading instruction and the correction of reading difficulties says, "There will continue to exist some children for whom regular classroom instruction will not be suitable. . . . They must have individual and small group instruction on a clinical basis or by specially trained personnel." Thus the reading clinic procedures, as such, do not vary much from the regular classroom procedures of the school system. Several conditions under which these procedures are used, however, differ significantly.

First, the diagnosis made by the clinic is more thorough. Russell (8, p. 517) considers thoroughness of diagnoses as essential in helping the disabled reader. Bond and Tinker say:

It is small wonder, then, that the classroom teacher, attempting to correct disabilities in this intricate learning for a wide variety of children who are in trouble, finds that no two cases have the same instructional needs. Any attempt to give a child remedial instruction must be based on a thorough diagnosis of his unique reading needs and personal characteristics. Such a diagnosis is the very core of less complex problems met in the classroom or for the more complicated problems of the clinic (1, p. 125).
This agrees with Johnson's statement that the basis for planning the specific clinical instructional program must be a thorough analysis of the individual's problems, their sources and their specific manifestations (6, p. 416).

Two parts of the Marion Monroe Diagnostic Tests, the Tota Word Test and the Word Discrimination Test, are used. These two parts are administered individually along with the Gray Oral Reading Test. A group test, Gates Reading Survey, is also administered.

According to Harris, "The two basic elements of an oral testing program are a test of connected reading material and a test of reading isolated words. From this one can judge the adequacy of a child's oral reading and determine the kinds of errors commonly made. In many cases this is quite sufficient (5, p. 210)."

Additional information from group intelligence tests, general achievement tests, and an interest inventory and the pupil's background is obtained for each child. Then an analysis of the tests is made. With this information, the clinic teacher places her pupils in small groups of six according to grade assignment and general level of reading ability.

The second basic difference is the adapting of instruction to the specific weaknesses of the pupils within the smaller group. No basal reading program is used. Thirdly, pupil interest is given prime consideration in the selection
of reading materials on the level indicated by the diagnosis. From this point, many of the specific drills and exercises used in developing word recognition and comprehension skills are employed by many regular classroom teachers.

Fernald believed that most cases of reading disability are due to blocking of the learning process by the use of limited, uniform methods of teaching. She concluded, "Such methods, although they have been successful with the majority of children, make it impossible for certain children to learn because they interfere with the functioning of certain abilities that these children possess (4, p. 175)."

Remedial work is not getting all pupils "up to grade" but providing adequate instruction for pupils who, for some reason or other, cannot benefit by the regular methods and materials used by most of the class. Remedial work is simply providing for individual pupils, each according to need (8, p. 495).

For a number of years the chief administrators in charge of the total instructional program have been concerned with the grade level at which the clinic program is most effective and recently extended the program to second grade pupils. It is generally believed that the less retarded the child, the greater is the gain.

Frequently principals request that pupils whose Kuhlmann-Anderson IQ's are below the minimum admission score of ninety
be admitted to the clinic program. To date no specific study of the clinic program suggests a valid basis for allowing or denying such a request. To this Cruickshank would say, "While the verbal intelligence test is the best single predictor of academic success available at the present time, a performance intelligence test adds a great deal to the total knowledge concerning the child's abilities, particularly in nonacademic areas" (2, p. 197). Furthermore, the preference by different principals for one grade level or the other in assigning pupils to the clinic has no research basis for denial or allowance, and additional information seems to be needed.

Hypotheses

The hypotheses of this study are

1. Mean gains in total oral reading achievement (a composite of three test scores, Iota Word Test, Word Discrimination Test, and Gray Oral Reading Test) will be significantly greater in the direction of the younger subjects.

2. Mean gains in total silent reading achievement as measured by Gates Reading Survey will be significantly greater in the direction of the younger subjects.

3. Mean gains in oral reading achievement and silent reading achievement of subjects whose intelligence
4. Mean gains in IQ's of subjects below the median IQ will be significantly greater than those whose IQ's are above the median.

5. Pupil variations in IQ's and gains in oral reading achievement will show significant positive correlation.

6. Pupil variations in IQ's and gains in silent reading achievement will show significant positive correlation.

7. The correlations between final IQ's and gains in oral reading achievement will be significantly greater for subjects with IQ's above the median than those with IQ's below the median.

8. The correlations between final IQ's and gains in silent reading achievement will be significantly greater for subjects with IQ's above the median than those with IQ's below the median.

Assumptions

Since the reading clinic teachers are required to meet certain qualifications beyond those of regular classroom teachers, it was assumed that they were sufficiently capable of administering and scoring the tests used and also teaching with individual variations the clinic program as outlined in
the Clinical Reading Handbook. It was further assumed that the pupils' progress in reading achievement would not be significantly affected because of the individuality of the clinic teacher assigned to them but instead would be affected by the type of program and general technique used by the clinic teachers.

Limitations of the Study

This study was limited to pupils assigned to the reading clinic for remedial instruction, their enrollment in a regular classroom being continued. This study was limited also to tests used as a regular part of the selected school system's testing program. A further limitation of this study was the lack of consideration given to psychological factors in determining the clinic's effectiveness.

Summary

Even though the lack of consideration given to psychological factors in this study constituted a limitation, it was felt the need for some specific evidence as to the effectiveness of the clinic's program could be obtained. The need for such information was very evident, and like much educational research, this information should prove valuable in pointing out the need for more intensive research of reading clinics and the effectiveness of their programs. If this has been accomplished, then the study has been worthwhile.
CHAPTER BIBLIOGRAPHY


CHAPTER II

RELATED STUDIES OF REMEDIAL READING AND INTELLIGENCE AS REFLECTED IN AVAILABLE LITERATURE

Perhaps no other school subject has received as much attention in contemporary educational and popular writing as that of reading. This attention seems to increase geometrically as a result of the expanded interest and emphasis given to education. One facet of reading that seems to receive its equal share of the attention is that of remedial reading. However, in reviewing the literature, it becomes very evident that the research in this area of reading is limited. Thus the studies reviewed herein present only those segments of information that are directly related to this particular research.

Before the thirties much was being said by such educators as Hildreth, Witty and Fernald concerning the how and why of remedial reading. Several research studies related to this study indicate the concern of reading specialists in recent years. Furthermore, the attention given to the measurement of intelligence of retarded readers has become evident in the literature.
Bleismer (3) had two purposes in his study that are related to this investigation. They were,

To determine the degree of similarity among estimates of reading capacity yielded by each of four capacity tests and to find to what extent results obtained with each of various groups tests sufficiently approximated results obtained with an individual test to warrant the use of group tests with retarded readers (3, p. 400).

The criterion was the Stanford-Binet Scale, and a Pearson's r was found for each of the other three tests with the criterion. From this study of sixty-eight pupils enrolled in a reading clinic of an urban central Texas city, Bleismer concluded that the Kuhlmann-Anderson Tests and the California Test of Mental Maturity tend to give lower estimates of reading capacity than the Stanford-Binet Scale, whereas the Durrell-Sullivan Test tended to give higher estimates. However, none of these yielded appraisals that were considered sufficiently comparable to those of the Stanford-Binet estimates.

A similar relationship was investigated by Plattor (13), whose hypothesis was that lower scores obtained by retarded readers may reflect their reading retardation rather than a basic incapacity to learn. For one group in this study, twelve seventh-grade classes (266 pupils) in the New York Junior High Schools were used, with over ninety-four per cent of the group having a retardation of more than two years in reading. The other group consisted of forty-three seventh
graders, less than five per cent of whom were retarded in reading. The Pintner Verbal and the Pintner Non-Language intelligence tests were administered to both groups. The results of the data strongly supported the hypothesis.

Chansky (5), in a study of forty-one subjects in remedial reading classes, administered the California Test of Mental Maturity to the subjects at the beginning of the research. Alternate forms of the Gates Reading Survey were used in the pre- and posttest sessions. Ages, IQ's, and reading achievement gains were ranked and tau coefficients were computed. The coefficient between IQ and reading achievement was .17, between IQ and age it was .49, and between age and reading achievement it was .32. Chansky found no empirical support for the belief that children with high IQ's make the greatest progress in remedial reading. Age or some other correlate, such as history of failure or responsiveness to small group instruction, was found to be related to improvement in reading rather than IQ.

Holloway (8), in an experimental study of the effects of training on IQ's, presented two results concerning IQ gains that are related to this investigation. He found that in the case of each intelligence test, the S.R.A. Primary Mental Abilities and the WISC, the total sample of 107 subjects gained significantly in mean IQ from the pre-tests to posttests. Furthermore, the IQ gains from the pre- to posttests were statistically significant on both the PMA
and WISC for each individual group, with the exception of one FMA control group.

Hage and Stroud (7) concluded from a study of 800 ninth grade pupils in Northeastern Iowa that at all levels of reading proficiency, verbal intelligence scores give a somewhat better prediction of academic achievement than do non-verbal scores. Partial and multiple correlation analyses suggested that verbal scores are affected more than non-verbal scores by reading proficiency.

Altus and Neville (1) made comparative studies of the WISC patterns or profiles of retarded readers. Altus specifically questioned, "Is there a distinctive test pattern associated with the scores on the Wechsler Intelligence Scale for Children with severe reading disabilities?" She studied the WISC profiles of twenty-four boys and one girl with severe reading disabilities from twelve elementary schools in Santa Barbara County, California. Severe reading disability was defined as a discrepancy of two years or more between a given child's expected reading level, as derived from his full scale WISC, and his actual reading level as measured by a standardized reading test. The mean WISC IQ's were 97.8 on the performance, 100.4 on the verbal, and 98.6 on the full scale, with standard deviations of 9.9, 10.3, and 9.2, respectively. She concluded the mean verbal-performance IQ discrepancy was negligible and not significant; however, the subtest patterning appeared to be fairly
distinctive. The coding and arithmetic were significantly lower (.01 level) than vocabulary, digit span, picture completion, object assembly and picture arrangement.

Neville (11) compared the subtest patterns of WISC for male retarded readers having IQ's of ninety or above with non-retarded readers also of average or higher IQ's. He used thirty-five pairs of subjects matched on total WISC, ± one point, grade level, and sex (all male). The results indicated that the scores for the retarded readers were significantly low in information, arithmetic, and digit span and significantly high in picture arrangement and block design. Their low scores seemed to be related to scholastic-type tasks and limited ability to concentrate while the high scores were somewhat removed from formal types of learning. He believed that these patterns suggested that the non-readers as a group would show most profit from a relatively non-verbal approach to that teaching which utilizes more kinesthetic and visual methods of instruction.

Sandstedt (14) studied the relationship between memory span and intelligence of severely retarded readers. One of the questions which she asked was whether retarded readers perform significantly higher on a non-verbal or on a verbal scale of intelligence. Her data, based on forty-five retarded readers, revealed no significant difference between the ability of these subjects to perform on verbal and non-verbal scales of the WISC.
Another study by Neville (12) investigated the relationship between reading skills and intelligence test scores. Specifically, he questioned the lack of reading ability tending to influence scores negatively on verbally oriented group intelligence tests for pupils in grade five. A subject pool of 148 fifth graders from two urban schools in upper-lower and lower-middle class neighborhoods was used. Scores from the Metropolitan Achievement Tests given during the last two months of the previous school year and IQ's from the Large-Thorndike Verbal Battery, Form A, Level 3, administered during the first three months of the fifth grade, were used for dividing the subject pool into three groups according to reading achievement. The three groups were:

- **Poor readers (PR)** 4.00 grade level or below
- **Average readers (AR)** up to 4.99 grade level
- **Good readers (GR)** above 4.99 grade level

Twenty subjects, fourteen males and six females, formed the PR group and twenty subjects randomly selected, fourteen males and six females, formed each of the remaining two groups. The WISC and Peabody Picture Vocabulary Test Form B were administered. An analysis of variance of subject scores on the available five intelligence measures was used. A correlation between the WISC and PPVT was found.

Two very pertinent conclusions were drawn which related to this investigation: first, a lack of reading ability...
negatively influences scores on verbally oriented group intelligence tests for pupils in grade five; and second, it appears that a grade of 4.0 achievement in reading as measured by the Metropolitan Achievement Tests is a critical minimum for obtaining reasonably valid IQ's for children in the intermediate grades when using verbally oriented intelligence tests. The PR group obtained group scores significantly lower than those on individual tests.

From these studies several ideas concerning the measurement of IQ of retarded readers became evident. One thought the evidence seemed to point out was that retarded readers are at a handicap with most group verbal tests. However, the evidence did not indicate that these verbal tests are totally invalid with retarded readers. In fact, Hage and Stroud pointed out the value of better prediction of academic success from verbal intelligence scores than the non-verbal. Holloway's results indicated that after sufficient training, IQ gains were found to be more statistically significant on group as well as individual intelligence tests. Such results pointed out very clearly the need for extreme care and discretion when using intelligence tests scores obtained from retarded readers.

Stanley Krippner (9), in his study "Correlates of Reading Improvement," attempted to determine if such variables as intelligence, social competence, vocabulary, mental health, socio-economic status, chronological age, grade placement,
and amount of reading retardation were related to the degree of improvement manifested in a remedial program. He felt that these findings would be useful in the future selection and grouping of poor readers for therapeutic programs. This idea for the use of the findings related directly to the present study. Krippner's subjects consisted of twenty-six boys and four girls who attended a summer reading clinic sponsored by the Kent State University Child Study Center. All subjects were administered Form W of the California Reading Test on the first day of the clinic and Form X on the last day. The subjects met five days per week for one hour of individual reading instruction and one hour of group instruction taught by twenty graduate students.

The degree of improvement as measured by the gains on the California Reading Test was correlated with the ten variables. Four variables, grade placement, WISC Verbal, WISC Full Scale, and Mental Health Percentile as determined by the Mental Health Analysis, gave significant correlations. From these results Krippner concluded, "If the purpose of a remedial program was to enroll those boys and girls who could be expected to make the most progress, those in the upper grades with high WISC Verbal and Full Scale IQ's, mental health assets, and extensive listening vocabularies should be selected" (9, p. 36).

However, he cautioned,
Because there is not a one-to-one ratio between test scores and genuine reading progress, the fairly high correlations between grade placement and improvement, and between chronological age and improvement might not indicate that older subjects actually make greater progress. The results may only point out that older subjects, because of their age, are often several years below their classmates in reading skills. A program of remediation might produce an improvement that will enable them to do well on several easier test items which they had previously missed. Younger subjects might make just as rapid progress in remedial classes yet suffer from comparison on the basis of their CAT scores (9, p. 37).

Krippner felt that this study strongly indicated that the absence of emotional disturbance and the presence of verbal intelligence can be fairly effective predictors of the progress to be made by poor readers enrolled in an adequately staffed remedial program.

Clark and Karp (6) made a study of an intensive summer remedial reading program that was begun at the Northside Center for Child Development. The remedial reading and arithmetic services were set up to help emotionally disturbed children. According to the authors,

The aim of the program was to give each child the kind of help he needed in the quickest, most effective way. Diagnostic tests were administered at the beginning of the program. Goals for each child were set up at a conference between the supervisor of the program and the remedial therapists (6, p. 139).

The remedial techniques used differed, but the remedial staff provided the individual attention for every child which was essential to their progress.
The results of the 104 subjects showed that children exposed for one month to individual summer instruction gained on the average almost the equivalent of a year's achievement in reading. Furthermore, Clark and Karp found that children who were most retarded gained appreciably. This certainly indicated the possibility that the effectiveness of a remedial reading program may vary with age of the pupil and degree of retardation.

In another report of a summer remedial reading program at the University of Minnesota Reading Clinic, Bond and Fay (4) found that the average gain over the five-week period was five school months. This average gain of the twenty-three pupils from grades one to six compared favorably with the expected gain of one month based on the average growth in reading achieved by these pupils during the regular school year.

The Mouly and Grant (10) study had as its purpose the devising of tentative standards that might be used by teachers in evaluating gains made by retarded readers receiving remedial instruction. The data were collected from 989 pupils enrolled in the reading centers of the public elementary schools of the city of Milwaukee, Wisconsin. Groups of two to six pupils received instruction for thirty minutes daily. The average IQ as measured by the California Mental Maturity Test was 102. This above-average ability resulted from the
basic criterion for enrollment, that of admitting children from grades four through eight whose reading age was behind their mental age by at least twelve months.

Their study concerned itself with the relationship that might exist between the extent of reading retardation and the growth in reading that results from competent remedial reading. The average retardation, the lag as previously defined between reading age and mental age, was seventeen months. For the purpose of converting reading gain to a monthly basis a semester was counted as five months. The average monthly gains were reduced to a constant, IQ = 100 base. Thus a gain of 1.6 month made by a pupil with an IQ of eighty was considered the equivalent of 2.0 months for a child with an IQ of 100. An average gain, adjusted to a base, IQ = 100, of 2.26 months of reading age per month of attendance in the centers was obtained. The authors set up a linear equation expressing the regression of gains on retardation. The data yielded the following equation:

\[ Y = 1.6476 + .0359X; \]

where \( Y \) is the estimated monthly gain for a pupil of IQ = 100, and \( X \) is the retardation in months.

The magnitude of this gain of the pupils in the reading center was explained by the favorable conditions prevailing in the reading centers and the extent of retardation of the
students. The results of this study indicated that comparing the gains of retarded readers might be understood better in terms different from the average measure of month-to-month gains when the ability of the pupil is considered.

Commenting on the Mouly and Grant study and similar studies by others, Bruce Balow says,

These studies support the belief that remedial reading instruction produces substantial gains while the pupil is actually receiving assistance. . . . Further the evidence suggests that remedial instruction enables the disabled reader to continue to progress in reading skills after his return to regular classes. The follow-up data indicate, however, that despite his continued progress the disabled pupil increasingly falls behind his classmates, because after his remedial assistance is terminated he does not progress as rapidly as does the normal reader (2, p. 581).

Balow (2) summarized the results of three separate investigations conducted by the Psycho-Educational Clinic at the University of Minnesota which provided evidence on the effect of intensive remedial instruction for severely disabled readers. The two elements of remedial work considered were immediate growth in reading skill and continued growth of the pupils after termination of intensive tutoring.

Psycho-Educational Clinic methods and techniques were governed by the requirements of the pupil, whose psychological and educational needs were determined. In each of the three samples the subjects were making progress at approximately half the rate of the normal pupils. Samples II and III received additional remedial assistance throughout the follow-up period but few of the pupils in Sample I
had any further assistance. Sample I did not lose their gains acquired during the time in the clinic but neither did they continue to develop on their own. Given far less intensive but nonetheless supportive help over the follow-up period, pupils in Samples II and III continued to develop in reading at a pace more rapid than that preceding the intensive tutoring. Their rate of growth over this period was approximately seventy-five per cent of normal growth.

Below concluded that these findings were consistent with previously reported research in supporting the effectiveness of remedial instruction for disabled readers. They extended the evidence in support of remedial effectiveness of the very severely disabled pupil who is referred to a university clinic after years of failure at about the sixth grade age. The highly instructive element of these findings, according to Balow, was that severe reading disability is not corrected by short-term intensive courses of treatment, even though it is ameliorated by such help. Neither was the complete cure to be found in intensive treatment followed by maintenance sessions of an hour or so per week, although again such a program was far superior to that of no special help at all. To Balow (2) these studies implied that severe reading disability is probably best considered a relatively chronic illness needing long term treatment rather than the short course typically organized in current programs.
Probably no one would disagree with Balow's idea of reading disability being a "chronic illness," for his review of these studies seems to dwell on this point. For the present study, however, his review emphasizes the caution with which the results must be reviewed and the conclusions that may be drawn. In fact, from all the studies surveyed, one quickly sees the necessity of viewing the findings in terms of the programs from which they were gathered. Yet, a continued study of clinic programs showing gains in relation to the degree of retardation and mental ability is a matter of necessity in emphasizing the vital needs of remedial reading as applied to the emphasis given to education today.
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CHAPTER III

METHODS OF STUDY

Description of the School System and Remedial Reading Clinic

This study incorporates the elementary schools of a large metropolitan school system in Texas. In this system, which has over eighty elementary schools, all socio-economic levels and many ethnic groups are represented. The school system is organized under a six-three-three plan and grades kindergarten through six were integrated the year this study was made. Furthermore, many of the subjects are enrolled in integrated schools in which the minority race is at least twenty-five per cent. The metropolitan community in which these subjects live exceeds 400,000 population and has a very diversified economic base.

The school system itself is in excellent financial condition and is able to pay top salaries and furnish excellent physical learning environments. Significant interest is being shown by the central administration in improving the instructional program for both the rapid learner and the educationally deprived. As was mentioned earlier, added emphasis is given to the remedial reading clinic both in interest and financial support since its beginning in 1949.
The reading clinic is staffed by a director, twenty-nine teachers, and one secretary and has central office facilities where the entire clinic staff meets one afternoon a week. The actual teaching of disabled readers is done in the local elementary schools. Each teacher is assigned from two to four schools, depending on the size of the school and the need for the clinic's services.

Pupils from grades two through six are referred to the clinic teacher by the regular classroom teachers and the principals for remedial services. After these pupils are interviewed and tested by the clinic teacher, then the principal, classroom teachers, and clinic teachers work together in assigning pupils to clinic classes.

Assignment to clinic classes is dependent upon several factors. First, the child must be disabled in some aspect of his reading development. Second, the pupil's general level of ability is considered. If an intelligence test score is available, the minimum limit of ninety IQ is observed. In special cases this may be relaxed and a pupil who is known to be below this standard is assigned to the clinic. Frequently, pupils for whom an IQ is not available are admitted. In such cases, a consensus judgment by those involved is reached as to whether this pupil can profit from the clinic's program. Occasionally a child is accepted and then removed because he does not seem to profit from the program.
Other factors such as health, emotional problems, school attendance, classroom behavior, and parent requests are considered in assigning pupils following the initial interview and testing. Since the number of pupils with whom the clinic teacher can work is limited to six at a time, some pupils are eliminated because of a lack of space in the clinic classes.

Pupils admitted to the clinic program are grouped in classes of six based on type of reading disabilities, severity of disability, and grade placement. Generally, pupils in grade three are not assigned to classes with sixth-grade pupils. No effort is made to group children according to sex or race.

Disabled readers are taught forty minutes twice a week in some designated room in the local school. During these remedial periods the pupils miss their regular reading class or some other academic area. Periods of relaxation are not used for remedial reading classes.

Many of the techniques and procedures suggested by such reading authorities as Fernald, Monroe, Gates, and Russell are used by the reading clinic, with emphasis on the specific needs of the individual child. With classes of six such emphasis is given more effectively than in the regular classroom of twenty-five or more pupils. Monroe’s remedial instructional methods, as described in Chapter Six of her book, *Children Who Cannot Read*, characterize the clinic’s instructional
approach more than any other, although other approaches are used for certain individual pupils when needed. In discussing various methods of teaching reading Fernald says, "Regardless of the method that predominates in any particular plan for the teaching of reading, various combinations of the different methods outlined here are used" (5, p. 29).

Each clinic teacher is supervised by the director as well as the principals in the local schools. Regular staff meetings are held by the clinic director on the afternoon the teachers are assigned to the central office. Specific problems, techniques and material needs are topics given attention during these staff meetings.

Procedures for Collection of Data

Following the organizing of remedial reading classes in mid-October for the 1965-1966 school year, a random sample of pupils by grade levels was made for this study. Twenty-eight of the twenty-nine clinic teachers submitted their class organization, from which every pupil was assigned a number within each grade. Then a sample of seventy-five pupils for each grade was selected by using a table of random numbers (1).

Each pupil in the sample was then given a silent reading test and an intelligence test during the latter part of October by the clinic teachers. These tests were collected, scored, and recorded under the supervision of the person making this study.
During the first two weeks of May, 1966, the clinic teachers again gave the prescribed oral and silent reading tests and the intelligence tests. The oral reading tests were scored by the clinic teachers while the silent reading tests and intelligence tests were collected, scored, and recorded as previously stated.

All data from the first and second testing periods were organized and treated as described under treatment of data. The silent reading test was given also to thirty pupils matched with pupils from the original sample during both testing periods. Details of this pilot study and its treatment are included in Chapter IV.

Description of Tests

In this study oral reading achievement was measured by a composite score of the Gray Oral Reading Test, the Iota Word Test, and the Word Discrimination Test. The Gray Oral Reading Test (6, pp. 3-28) consists of thirteen paragraphs arranged in sequence of increasing difficulty. The child begins with paragraph one and is allowed to continue reading until he makes seven errors in each of two successive paragraphs. The level of these paragraphs indicates his grade level of reading ability. Passage scores are determined by reading a table that involves use of time and errors. The norms are different for boys and girls. Even though the tests have comprehension questions following each paragraph,
the comprehension scores are not used in securing a grade equivalent for each pupil.

Standardization was determined by use of 502 male and female subjects from public elementary, junior and senior high schools in Florida and also suburban and metropolitan Illinois. Coefficients of intercorrelation among grade-scores on each of the four forms were calculated. All subjects ranged from .972 to .982. The standard error of measurement was less than 4.00 points in the total passage score for any pupil sixty-six per cent of the time. "The fact that pupils randomly selected from representative groups as judged by the cooperating schools obtained scores that distinguish one grade from another indicates concurrent validity" (6, p. 29).

The Iota Word Test measures the ability to read isolated words accurately, whereas the Word Discrimination Test measures the ability to select the correct word from lists of confusion words (3, p. 7). The scores are the number of words correctly read and the number of words correctly discriminated, respectively. Grade scores from these two tests and the Gray Oral Reading Test were obtained from the raw scores. An average of these three grade scores was selected as a measure of the pupil's oral reading achievement. No specific reliability is stated for these three tests used together, but a reading index using the composite of these
tests along with chronological age, mental age, and arithmetic is found to have a reliability coefficient (Pearson's $r$, first test correlated with re-test) of $0.94 \pm 0.011$ (10, p. 17).

Marion Monroe (10, pp. 183-202) gives complete directions and norms for the Iota Word Test and the Word Discrimination Test since no manual, as such, is published. The norms are present for each sub-test and for the Gray Oral Reading Test. Monroe further states that training for administering these tests is necessary; therefore, the reading clinic teachers gave the tests used in this study.

Subjects were given an additional achievement test, Gates Reading Survey, to measure silent reading achievement. Gates Reading Survey yields three grade scores, speed, vocabulary, and comprehension, which are averaged to give a composite grade level. Forms One and Three are used in the fall and spring, respectively.

Each subject's IQ is measured by the Kuhlmann-Anderson Intelligence Tests, Sixth Edition. Two test reviewers, Henry E. Garrett and David Degal (5, pp. 404-406) say that the Kuhlmann-Anderson Intelligence Tests, Sixth Edition, are among the best as all-inclusive group intelligence tests giving an over-all mental age. Accordingly, the K-A tests have high reliability as determined by the split-half
coefficient. They are .91, grade 3; .88, grade 5; .92, grade 7; and .95, grade 9. The standard error of a score (5.5 points of IQ) compares favorably with the same error of measurement of the 1927 Stanford-Binet. Validity of these K-A ten subtests is defined as that ability of the tests to detect differences in mental development over the age range covered. According to the above mentioned reviewers, it seems clear that the test battery is able to differentiate satisfactorily among children who are old-for-grade, young-for-grade and on-grade. Both reviews (2) encourage the label "Kuhlmann-Anderson IQ's" to distinguish them from Stanford-Binet IQ's.

The test is highly verbal, although there is little actual reading. It has many separately timed sub-tests which makes administration somewhat difficult. This is one of the best all-around group intelligence tests for obtaining an over-all mental age. The test yields a single over-all IQ. Reliability is satisfactory, coefficients ranging from .88-.95 computed for a single grade. Validity data as given in the manual are adequate (11, p. 573).

Study of Clinic Teachers

An instrument (see Appendix) was devised to determine whether teachers in the clinic had followed the clinic program for teaching the disabled readers. In October and
following the final tests in May, each teacher in this study was given the rating instrument mentioned above and asked to indicate the method that she actually used in teaching her pupils. As a further check, the clinic director was given the same instrument to describe how each of her teachers taught the remedial reading program. The procedures for the development and use of this instrument (8, pp. 23-28) were as follows.

1. Twenty-eight items from the regular classroom teacher approach and the reading clinic teacher approach to teaching reading were selected as being appropriate or unique to each group of teachers.

2. The items from both approaches were intermixed so that no particular arrangement or order resulted.

3. This inventory was given to twenty-one reading clinic teachers and to twenty-one classroom teachers in May, 1965.

4. The items were evaluated with one of the following ratings:
   a. Very inconsistent with the way the teacher taught last year.
   b. Somewhat inconsistent with the way the teacher taught last year.
   c. Neither inconsistent nor consistent with the way the teacher taught last year.
   d. Somewhat consistent with the way the teacher taught last year.

5. Items were scored from the ratings by each group as follows:
   
   1 = -2  2 = -1  3 = 0  4 = +1  5 = +2
6. A total score for each item by each group of teachers was found. The difference between these scores on each item was then determined and the mean and standard deviation of the differences were found.

7. The mean for the differences (treated as raw scores) was found to be 39 with a standard deviation of 23. Thus a difference equal to or greater than the mean was designated as a discriminating item and used in the revised inventory.

Example: Item number one had a score of -8 for the classroom teacher and +42 for the reading clinic teachers. The difference then was above the mean and designated as an item for the revised inventory.

8. Using suggestions from teachers, several items were rewritten to increase clarity and are included in the revised inventory if they were sufficiently discriminatory on the first inventory.

9. A revised inventory of sixteen items equally divided between the two approaches for teaching reading was written.

10. Each clinic teacher's approach was determined as follows:

a. The teacher's rating of each item was weighted by multiplying by two.

b. The rating of the items pertaining to the clinic approach were averaged and rounded off to the nearest whole number, as were the items pertaining to the classroom-teacher approach.

c. The average of the ratings of the clinic-teacher approach items were used as an indicator score, and the average of the ratings of the conventional items were
its reciprocal; then the two numbers were added for a composite score.

d. For example, in rating a clinic teacher:

Step 1 - If average on clinic approach items = 8.8
If average on classroom approach items = 2.2

Step 2 - Averages rounded off to the nearest whole number would be 9 and 2, respectively.

Step 3 - The composite score = (Indicator score) + (Reciprocal score).

Composite score = 9 + 10 = 19

e. The rating for a classroom teacher was similar.

11. The consistency rating that was used is as follows:

Composite score

14 - 20 indicates clinic teacher method used by the teacher
10 - 13 indicates eclectic teaching
4 - 9 indicates classroom teacher method used by the teacher

12. As a further check for consistency, all teachers in the clinic participating in this study were given the inventory in September, 1965, and again in May, 1966. A summary of the data from the use of this instrument with the twenty-eight teachers participating in the study is shown in Table I.

*To determine reciprocal score:

If raw score was the reciprocal score was
1 or 2 10
3 or 4 8
5 or 6 6
7 or 8 4
9 or 10 2
Table I

Means and Standard Deviations of Teacher Inventory of Approaches to Teaching Reading Resulting from the September and May Administrations

<table>
<thead>
<tr>
<th>Inventory</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>26</td>
<td>16.81</td>
<td>2.37</td>
</tr>
<tr>
<td>2nd</td>
<td>26</td>
<td>17.68</td>
<td>1.75</td>
</tr>
</tbody>
</table>

The results indicate that teachers followed the general clinic method of teaching as measured by this instrument, since a score between 14-20 indicated the clinic teacher method. Furthermore, the small standard deviations and the fact that only three scores were below fourteen on the first inventory and none on the second help to substantiate this conclusion.

Treatment of Data

The tenability of the hypotheses of this study was determined by the analysis of the test results. The following statistical methods and research procedures were utilized.

Gains in oral and silent reading for each subject were determined by subtracting the fall reading grade scores from the spring. The same procedure was used for determining mean variations in the IQ's. The median IQ of each grade level was found and subjects above and below the median were assigned to IQ levels one and two respectively. Subjects
from grades three through six comprised the grade levels' factor for the four groups.

The research design was a two by four factorial design. Hypotheses one, two, three and four were tested by complex analyses of variance as described by Lindquist (9, pp. 121-151) and Edwards (4, pp. 207-214). The null hypotheses to be tested by the complex analyses of variance were

1. There are no differences among grade levels in the amount of reading achievement. (Oral-silent)

2. Pupils with high intelligence test scores and those with low intelligence test scores do not differ significantly in their amount of oral-silent reading achievement gain.

3. The differences among grade levels and IQ levels in reading achievement gain are not significant.

Concerning the assumptions underlying analysis of variance, Hays says,

For experiments with relatively large numbers of observations per cell, the requirement of a normal distribution of errors seems to be rather unimportant. . . . When the data table represents an equal number of observations in each cell, the requirement of equal error variance in each treatment combination population may also be violated without serious risks (7, p. 40).

When significant F's were found, a Fisher's t test was used between the means of that factor to determine the significant differences.
Hypotheses five and six were tested by finding the correlations (a Pearson r) between the variations in IQ's and the gains in reading achievement. The test of significance was that the r's did not differ from zero.

Hypotheses seven and eight were tested by finding the appropriate correlations between IQ's and gains in reading achievement scores. The significance of the difference between the two r's in each hypothesis was determined by testing the null-hypothesis of no difference between the two correlation coefficients.

From this study, two additional analyses were made of the data in order to encourage further inquiries. First, data from all the grade levels and intelligence levels were grouped together. Mean gains for oral reading and silent reading were determined, and the significance of the differences was tested by Fisher's t. Second, a control group of subjects who had been tested by the clinic but did not receive the clinic program was matched with subjects in the fourth, fifth and sixth grade reading clinic classes, and the mean gains in oral and silent reading achievement were tested by Fisher's t. Subjects were matched on intelligence test scores, sex, grade level, and oral reading scores.

The results from these two analyses were limited by the lack of a control group for the first analysis and a bias in pool of subjects eligible for selection and matching.
for the control group in the second analysis. Their possible significance for further study, however, did seem to warrant the collection and treatment of the data.
CHAPTER BIBLIOGRAPHY


In order to test the first four hypotheses of this study a two-by-four statistical design involving a complex analysis of variance was used. The intelligence levels were determined by dividing the distribution of IQ's on the first testing by grade levels at the median. The grade levels consisted of subjects in grades three, four, five and six who were assigned to the reading clinic. The basic design is given below with the median IQ for each grade level being noted.

<table>
<thead>
<tr>
<th>Intelligence Levels</th>
<th>Grade Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>3-1 4-1 5-1 6-1</td>
</tr>
<tr>
<td>Median IQ</td>
<td>94 90 92 96</td>
</tr>
<tr>
<td>High</td>
<td>3-2 4-2 5-2 6-2</td>
</tr>
</tbody>
</table>

Subjects were placed in design according to their grade level assignment in school and their intelligence test scores obtained from the Kuhlmann-Anderson Intelligence Tests, Sixth Edition, which were administered in October. For example, a
subject in the third grade who scored below the median IQ for all subjects in the third grade sample was placed in cell 3-1. A third grade subject who scored above the median IQ for all subjects in the third grade sample was placed in cell 3-2. Thus all subjects were placed in the design accordingly.

Subjects

Seventy-five subjects were randomly selected from each grade level of pupils assigned to the reading clinic. After the final testings in May, the following number of subjects per grade level had completed all the required tests for this study.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 3</td>
<td>66</td>
</tr>
<tr>
<td>Grade 4</td>
<td>67</td>
</tr>
<tr>
<td>Grade 5</td>
<td>69</td>
</tr>
<tr>
<td>Grade 6</td>
<td>71</td>
</tr>
</tbody>
</table>

Complete tests results were not obtained from twenty-seven subjects who were dropped from the reading clinic for such reasons as moving, illness, or parent request. In order to obtain a sample of equal size for each cell in the design, a total of seven subjects from grades four, five, and six were randomly omitted so that a total of sixty-six subjects per grade level was included in the final analysis.
Analysis of Oral and Silent Reading Achievement

Gains in oral and silent reading achievement were determined by subtracting composite scores on the oral reading tests and the silent reading tests administered in the fall from those administered in the spring. The discussion of the results of this study will be found in Chapter V. All data for the complex analyses of variance and the coefficients of correlation were computed by the North Texas State University Computer Center. A summary of mean gains by cell for oral reading is presented in Table II.

**TABLE II**

MEAN GAINS OF ORAL READING ACHIEVEMENT AS MEASURED BY THE AVERAGE OF THE IOTA WORD TEST, THE WORD DISCRIMINATION TEST AND GRAY ORAL READING TEST

<table>
<thead>
<tr>
<th>IQ Levels</th>
<th>Grade Levels</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>1.39*</td>
<td>1.24*</td>
<td>1.41*</td>
<td>1.33*</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>1.66*</td>
<td>1.53*</td>
<td>1.31*</td>
<td>1.44*</td>
<td></td>
</tr>
</tbody>
</table>

*Significant at the .01 level of confidence.

To test the null hypothesis that mean gains in oral reading achievement were not significantly different by grade levels, a complex analysis of variance technique was applied to the two-by-four statistical design. The F values
were to test for significance of difference between grade levels and intelligence levels.

A summary of the data obtained from the application of the complex analysis of variance is presented in Table III.

**TABLE III**

**ANALYSIS OF VARIANCE OF ORAL READING GAINS ON FOUR GRADE LEVELS AND TWO IQ LEVELS**

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Estimate of Variance</th>
<th>F Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>IQ Levels</td>
<td>1.654580</td>
<td>1</td>
<td>1.65458</td>
<td>5.003*</td>
</tr>
<tr>
<td>Grade Levels</td>
<td>1.497680</td>
<td>3</td>
<td>.499226</td>
<td>1.508**</td>
</tr>
<tr>
<td>Interaction</td>
<td>1.869490</td>
<td>3</td>
<td>.623163</td>
<td>1.862**</td>
</tr>
<tr>
<td>Within Groups</td>
<td>84.76970</td>
<td>256</td>
<td>.331131</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>89.791480</td>
<td>263</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at the .05 level of confidence.

**Not significant at the .05 level of confidence.

**Degrees of Freedom***

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
</tr>
</thead>
<tbody>
<tr>
<td>IQ Levels Groups</td>
<td>( r-1 ) = 2-1 = 1</td>
</tr>
<tr>
<td>Grade Levels Groups</td>
<td>( c-1 ) = 4-1 = 3</td>
</tr>
<tr>
<td>Interaction</td>
<td>((r-1)(c-1) = (1)(3) = 3)</td>
</tr>
<tr>
<td>Within Groups</td>
<td>(N-r_\tau) = 264-8 = 256</td>
</tr>
<tr>
<td>Total</td>
<td>(N-1) = 263</td>
</tr>
</tbody>
</table>

***\(r_\tau\) = the total number of groups or 8

\(r\) = number of IQ groups or 2

\(c\) = number of grade levels or 4
The F value for the IQ levels was the only one that was significant at the .05 level of confidence. Thus, the null hypothesis of no significant difference in oral reading achievement by grade levels is tenable as indicated by the results of this analysis. The same statistical method as described for analysis of gains in oral reading achievement was used to test the null hypothesis that mean gains in silent reading achievement were not significantly different by grade levels. A summary of mean gains by cell for silent reading is presented in Table IV.

**TABLE IV**

**MEAN GAINS OF SILENT READING ACHIEVEMENT AS MEASURED BY THE AVERAGE OF GATES READING SURVEY**

<table>
<thead>
<tr>
<th>IQ Levels</th>
<th>Grade Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Low</td>
<td>.46*</td>
</tr>
<tr>
<td>High</td>
<td>.85*</td>
</tr>
</tbody>
</table>

*Significant at the .01 level of confidence.

It should be noted that all mean gains presented in Tables II and IV were significant at the .01 level of confidence. Also, mean gains in oral reading achievement were greater than those for silent reading achievement as measured by the instruments used in the study. Table V gives
a summary of the data obtained from the application of the complex analysis of variance to the data presented in Table IV.

TABLE V

ANALYSIS OF VARIANCE OF SILENT READING GAINS ON FOUR GRADE LEVELS AND TWO IQ LEVELS

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Estimate of Variance</th>
<th>F Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>IQ Levels</td>
<td>.774580</td>
<td>1</td>
<td>.774580</td>
<td>1.343*</td>
</tr>
<tr>
<td>Grade Levels</td>
<td>2.580720</td>
<td>3</td>
<td>.860240</td>
<td>1.490*</td>
</tr>
<tr>
<td>Interaction</td>
<td>2.389496</td>
<td>3</td>
<td>.796496</td>
<td>1.379*</td>
</tr>
<tr>
<td>Within Groups</td>
<td>147.595160</td>
<td>256</td>
<td>.576543</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>153.33970</td>
<td>263</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Not significant at the .05 level of confidence.

Degrees of Freedom**

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
</tr>
</thead>
<tbody>
<tr>
<td>IQ Levels Groups</td>
<td>r-1 = 2-1 = 1</td>
</tr>
<tr>
<td>Grade Levels Groups</td>
<td>c-1 = 4-1 = 3</td>
</tr>
<tr>
<td>Interaction</td>
<td>(r-1)(c-1) = (1)(3) = 3</td>
</tr>
<tr>
<td>Within Groups</td>
<td>N-r = 264-6 = 256</td>
</tr>
<tr>
<td>Total</td>
<td>N-1 = 263</td>
</tr>
</tbody>
</table>

**r_t = the total number of groups or 8
r = number of IQ groups or 2
c = number of grade levels or 4

As is indicated by the non-significant F values, the null hypothesis of no significant difference in silent reading achievement is tenable. This differs from the results of the
Oral reading achievement in that the mean gains were not significant between IQ levels.

The null hypothesis that mean gains in oral and silent reading achievement of subjects whose intelligence quotients are above the median IQ will not be proportionate to those below the median is not tenable since no significant F values for interaction in either oral or silent reading gains were evident. In fact the F values for either of the interactions did not reach the .05 level of confidence.

Analysis of Intelligence Quotients Variations

Because intelligence quotients as measured by the Kuhlmann-Anderson Intelligence Test is a criterion for admission to the reading clinic, the analysis of the IQ variation seemed important in this study. A summary of the means of the amount of IQ variation is presented in Table VI.

**Table VI**

Means of the IQ Variation as Measured by the Kuhlmann-Anderson Intelligence Tests, Sixth Edition

<table>
<thead>
<tr>
<th>IQ Levels</th>
<th>Grade Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Low</td>
<td>5.85*</td>
</tr>
<tr>
<td>High</td>
<td>3.33**</td>
</tr>
</tbody>
</table>

*Significant at .01 level of confidence.
**Significant at .05 level of confidence.
***Not significant.
As is indicated, only two of the groups above the median IQ of the Kuhlmann-Anderson IQ variations were significant at even the .05 level of confidence and two were not significant at all. The complex analysis of variance was applied again to test the null hypothesis that the amount of variation of IQ's of subjects below the median IQ was not significantly greater than that for those above the median IQ. The summary of the data obtained from the complex analysis of variance is presented in Table VII.

**Table VII**

ANALYSIS OF VARIANCE OF IQ VARIATION ON FOUR GRADE LEVELS AND TWO IQ LEVELS

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Estimate of Variance</th>
<th>F Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>IQ Levels</td>
<td>939.409000</td>
<td>1</td>
<td>939.409000</td>
<td>17.449*</td>
</tr>
<tr>
<td>Grade Levels</td>
<td>216.560500</td>
<td>3</td>
<td>72.186833</td>
<td>1.341</td>
</tr>
<tr>
<td>Interaction</td>
<td>501.045000</td>
<td>3</td>
<td>167.015000</td>
<td>3.102**</td>
</tr>
<tr>
<td>Within Groups</td>
<td>13782.244000</td>
<td>256</td>
<td>53.836890</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>15439.258000</td>
<td>263</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at the .01 level.
**Significant at the .05 level.
Degrees of Freedom

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>IQ Levels Groups</td>
<td>r-1</td>
<td>2-1</td>
</tr>
<tr>
<td>Grade Levels Groups</td>
<td>c-1</td>
<td>4-1</td>
</tr>
<tr>
<td>Interaction</td>
<td>(r-1)(c-1)</td>
<td>(1)(3)</td>
</tr>
<tr>
<td>Within Groups</td>
<td>N-r</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>N-1</td>
<td></td>
</tr>
</tbody>
</table>

\[ ***r_t = \text{the total number of groups or } 8 \]
\[ r = \text{number of IQ groups or } 2 \]
\[ c = \text{number of grade levels or } 4 \]

As is indicated, a highly significant F value was found for the IQ levels; this means that the null hypothesis is not tenable since it can be rejected at better than the .01 level of confidence. The data in Table VIII show that the significant variation of IQ's is positive and in favor of the group below the median.

### TABLE VIII

MEAN VARIATIONS AND STANDARD DEVIATIONS OF IQ'S AS DETERMINED BY THE KUHLMANN-ANDERSON INTELLIGENCE TESTS, SIXTH EDITION, FOR GROUPS ABOVE AND BELOW THE MEDIAN

<table>
<thead>
<tr>
<th>IQ Levels</th>
<th>Mean Variations</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>5.3333</td>
<td>7.3923</td>
</tr>
<tr>
<td>High</td>
<td>1.5606</td>
<td>7.4297</td>
</tr>
</tbody>
</table>

The F value for interaction was not significant at the .01 level. However, the fact that it was significant at the
.05 level will be discussed in Chapter V in terms of the negative variation in IQ as indicated in cell 4-2 of Table VI.

Analysis of Correlation Coefficients

The null hypotheses that subject variation in IQ's and gains in oral and silent reading achievement would not show significant positive correlation were tested by finding the appropriate Pearson r for each relationship and then testing its significance. The significance of each Pearson r's deviations from 0 was tested by the technique suggested by Downie (1, pp. 142-143). A summary of the data from the calculations of the correlation coefficients and their significance is given in Table IX.

TABLE IX

<table>
<thead>
<tr>
<th>Type of Reading and IQ Variation</th>
<th>r</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral-K-A</td>
<td>.072</td>
<td>1.161*</td>
</tr>
<tr>
<td>Silent-K-A</td>
<td>.098</td>
<td>1.561*</td>
</tr>
</tbody>
</table>

*Not significant at the .05 level.

As can be seen from Table IX, neither of the correlation coefficients were significant. Therefore, the null hypotheses are tenable.
Pearson r's between final IQ's and gains in oral reading achievement for subjects above and below the median IQ were determined. The same type r's were determined by using gains in silent reading achievement. The significance of the differences between these two r's was tested by using Fisher $z$-Statistic (1, pp. 144-145) for the silent reading achievement only. The reason for only one test will be evident from the summary of data for these correlation coefficients presented in Table X.

**Table X**

**Correlation Coefficients Between Final IQ's and Gains in Oral and Silent Reading Achievement for Subjects Above and Below the Median IQ**

<table>
<thead>
<tr>
<th>Final IQ and Type Reading Gain</th>
<th>High r</th>
<th>Low r</th>
<th>$z$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>.0692</td>
<td>.1667</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Silent</td>
<td>.0968</td>
<td>.0940</td>
<td>.040*</td>
</tr>
</tbody>
</table>

$N = 132$ pairs  
*Not significant

The null hypothesis that correlations between final IQ's and gains in oral reading achievement will not be significantly greater for subjects with IQ's above the median than those with IQ's below the median was tenable. In fact,
as is shown by Table X, the r for those above the median is smaller than for those below the median. Thus a significance test of differences was not determined. A similar null hypothesis using gains in silent instead of oral reading achievement was likewise tenable, since the difference between the two correlations was extremely small and not statistically significant.

Analysis of Data From Experimental and Control Groups

Many pupils were tested by the reading clinic teachers who were not accepted for various reasons, such as classes too large, staff recommendations, or some unusual physical handicap. From this pool of subjects thirty-five were matched with thirty-five subjects participating in this study and assigned to the clinic. They were given the same testing program as those used in this study. Even though this represents a bias in sampling, it was felt that such a study might be of value for future research.

The subjects were matched according to original oral reading test averages, IQ's, grade assignments, and sex. A summary of these matched variables is presented in Table XI.
TABLE XI

MEANS OF ORAL READING ACHIEVEMENT AS MEASURED BY THE AVERAGE OF THE IOTA WORD TEST, WORD DISCRIMINATION TEST AND GRAY ORAL READING TEST, SILENT READING AS MEASURED BY AVERAGE OF GATES READING SURVEY, AND KUHLMANN-ANDERSON, SIXTH EDITION, IQ'S OF THE EXPERIMENTAL AND CONTROL GROUPS

<table>
<thead>
<tr>
<th>Type of Measurement</th>
<th>Experimental</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral Reading</td>
<td>3.31</td>
<td>3.34</td>
</tr>
<tr>
<td>Silent Reading</td>
<td>3.68</td>
<td>3.67</td>
</tr>
<tr>
<td>K-A IQ</td>
<td>93.76</td>
<td>93.48</td>
</tr>
</tbody>
</table>

N = 29 matched pairs.

The sample included twenty-four girls and thirty-four boys of which there were thirty-eight in grade four, fourteen in grade five, and six in grade six. From the original sample of thirty-five matched pairs, six were eliminated because one member of each pair did not complete all the tests required in the final testing in the Spring.

After the final testings in May, mean gains in oral and silent reading achievement and mean IQ variations were found. A $t$ test for the significance of difference between the means of two small correlated samples (2, pp. 84-86) was used to analyze the data. A summary of the analysis of the differences between the mean gains is presented in Table XII.
TABLE XII

ANALYSIS OF DIFFERENCES BETWEEN MEAN GAINS OF ORAL AND SILENT READING ACHIEVEMENT AND VARIATIONS IN IQ'S FOR THE EXPERIMENTAL AND CONTROL GROUPS

<table>
<thead>
<tr>
<th>Group</th>
<th>Oral Reading</th>
<th>t</th>
<th>Silent Reading</th>
<th>t</th>
<th>IQ</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>1.38</td>
<td>19.71*</td>
<td>.78</td>
<td>6.00*</td>
<td>2.93</td>
<td>1.88***</td>
</tr>
<tr>
<td>Control</td>
<td>.60</td>
<td>5.00*</td>
<td>.18</td>
<td>2.25**</td>
<td>-2.00</td>
<td>1.09***</td>
</tr>
<tr>
<td>Difference</td>
<td>.78</td>
<td>5.57*</td>
<td>.60</td>
<td>3.33*</td>
<td>4.93</td>
<td>2.71*</td>
</tr>
</tbody>
</table>

*Significant at .01 level of confidence.
**Significant at .05 level of confidence.
***Not significant.

As can be seen from Table XII, the difference between experimental and control group mean gains were significant at the .01 level. However, neither of the mean variations in IQ's for the experimental or control group was significant at the .01 or .05 levels of confidence.

One final analysis of the data was made by finding the total mean gain for oral and silent reading achievement for the two hundred sixty-four subjects in the study. The summary of this analysis is shown in Table XIII.

This analysis, along with that of the experimental and control groups, did seem to indicate that significant effective gains are made by pupils assigned to the reading clinic.
TABLE XIII

ANALYSIS OF MEAN GAINS IN ORAL AND SILENT READING ACHIEVEMENT AND THE SIGNIFICANCE OF EACH

<table>
<thead>
<tr>
<th>Reading</th>
<th>Mean</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>1.42</td>
<td>47.33*</td>
</tr>
<tr>
<td>Silent</td>
<td>.83</td>
<td>16.60*</td>
</tr>
</tbody>
</table>

*Significant at the .01 level of confidence.
CHAPTER BIBLIOGRAPHY


CHAPTER V

SUMMARY OF RESULTS, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

The major purpose of this study was to identify the oral and silent reading achievement of pupils assigned to the reading clinic and to analyze and compare the grade levels with levels of intelligence as measured by the Kuhlmann-Anderson Intelligence Tests, Sixth Edition. It was felt that such information could aid in the selection and assignment of pupils to the reading clinic.

Specifically the study attempted to determine
1. The grade level at which the reading clinic was most effective.
2. The intelligence level at which the reading clinic was most effective.
3. The statistical significance of the variation in intelligence test IQ's.
4. The correlations between group intelligence test IQ's and total reading achievement.

Summary of Results

Data from oral and silent reading achievement and IQ's were obtained from a random sample of 264 subjects assigned
to the reading clinic. The data from the research design were analyzed by complex analyses of variance.

As a result of these analyses the null hypotheses for hypotheses one and two were held tenable since the F values were not significant. The F values for interaction in the complex analyses of variance of the mean gains in oral and silent reading achievement were not significant; thus the null hypothesis for hypothesis three was not tenable. Significant F values for interaction would have indicated a lack of proportion.

By the use of the complex analyses of variance hypothesis four was held tenable since the null hypothesis could be rejected at the .01 level of confidence. The data indicated that the significant positive variation of IQ's was in favor of the group below the median.

The null hypotheses for hypotheses five and six were tested by finding the appropriate Pearson r's and testing the significance of the r's. Since both of the r's were very small and not significant, the null hypotheses were held tenable.

After finding appropriate Pearson r's needed to test the null hypotheses for hypotheses seven and eight, the significance of the differences between the r's were determined. As a result, the differences were not found to be significant and both null hypotheses were considered tenable.
The analysis of the experimental and control groups and of the total mean gains was tested by finding the significance of difference between mean gains. In both cases significant differences were found.

Conclusions

From the data analysis the following conclusions were drawn concerning this remedial reading clinic's program.

1. The grade placement of pupils was not a significant factor in determining the child's success in the reading clinic program.

2. Pupils whose IQ's were below the median or near the minimum level of acceptance showed the greatest positive variation in their intelligence test scores while assigned to the clinic.

3. The criterion for accepting pupils with a minimum IQ of ninety as measured by a group intelligence test was questionable.

4. The increase in oral reading achievement, as measured by the clinic evaluation, was greater than the increase in silent reading achievement.

5. The increase in oral reading achievement was significantly greater for subjects above the median IQ but a similar increase in silent reading achievement was not found.

6. Very small relationships between IQ variations and the increase in reading achievement were found.
7. The small experimental-control group project did indicate that the reading clinic was more effective than the regular classroom teacher for pupils who need remedial help. This conclusion was limited by the previously discussed bias in the selection of the control group sample.

8. The increase in reading achievement of pupils assigned to the reading clinic was significant.

9. The teachers in the clinic generally followed the clinic program with only individual variation in teaching technique, as shown by the inventory of approaches to teaching reading.

Implications

1. The results of this study indicate that the factors of IQ, deviations within ten points of the low normal range, and grade level are not significant factors in determining the pupil's success in the reading clinic program. Therefore, it is doubtful if both of them are acceptable criteria as they are being used.

2. The lack of significance of the factors related to progress in reading in this study, along with evidence from related research and reading authorities, present a strong implication that psychological factors should be considered by any remedial reading clinic that proposes to help disabled readers.
3. The differences between oral and silent reading achievement may be the result of scoring technique.

4. The low relationships between IQ and reading achievement tend to confirm a conclusion by Neville (12) that a critical minimum in reading achievement is necessary to obtain reasonably valid IQ's for children in the intermediate grades when using verbally oriented intelligence tests.

5. The results of this study and the study by Holloway (8) indicate that significant IQ gains may be expected following sufficient improvement in reading.

Recommendations

The following recommendations were based on the results of this study, findings of related research, and writings of recognized authorities.

1. An individual intelligence test such as the Stanford-Binet or the Wechsler Intelligence Scale for Children should be given to pupils being diagnosed by a reading clinic. As pointed out by Bleismer (2), Platter (13), Hage and Stroud (6), Neville (12) and Smith and Dechant (16), low scores on group intelligence tests may very well reflect the reading retardation rather than the basic incapacity of disabled readers to learn.
2. A thorough diagnosis of reading disability should be made. The administering of a series of diagnostic reading tests is listed as an essential by Russell (15), Monroe (11), and Bond and Tinker (3). These tests should be given in addition to survey tests and informal tests given by the teacher because they provide a more searching study of reading strengths and weaknesses. Such tests as the Gates Reading Diagnostic Tests, the Durrell-Sullivan Capacity Tests, and the Durrell Analysis of Reading Difficulty may be used.

3. Furthermore, these tests should be given individually in order that the skilled examiner may obtain information from the testing situation as well as the test scores.

4. A visual screening to detect possible visual defects is essential and can be made by the use of such instruments as the Keystone Visual Telebinocular or the James Eye Test. Both are suggested by Bond and Tinker (3). If a possible visual defect is indicated, the child should be referred to a competent eye specialist.

5. Every child who is a reading disability case should have a hearing test (3). According to Betts (1), impairment of hearing may be causally related to poor reading, or it may reveal merely another difficulty for which non-achievers must compensate. Kennedy (9) and Robinson (14) found that children with hearing deficiencies for high frequencies tended to be poor readers. The use of an audiometer should be a part of the diagnostic procedure.
6. "The child who is in a state of chronic fatigue may become almost continuously, or at least intermittently, inattentive (3, p. 98)." By using school health records, teacher observations, and parent conferences, the general health of the pupil should be evaluated. If conditions concerning the child's health are such that it appears to be abnormal, a thorough physical should be recommended.

7. Krippner's study (10) strongly indicated that the absence of emotional disturbance was significant in predicting progress for poor readers. Interpersonal assessments of pupil's personalities should be made by the use of such techniques as anecdotal records, published personality-trait rating instruments and sociometric techniques. As Bonney (4) pointed out, sociometric data can be useful in guidance work with individuals, not only in regard to personality problems, but also in regard to academic difficulties.

8. A thorough analysis of the child's speech should be made. Monroe (11) noted that faulty articulation may directly affect reading, and Gates (5) pointed out that it is possible speech difficulties may spread to silent reading.

9. A case study file or collection of pertinent information procedures should be organized with information concerning the child's physical, educational, and intellectual evaluations. A section concerning environmental factors—home situation, school history, social activities, interests, and related academic achievement—should be included.
10. The work of the reading clinic should be closely coordinated with the psychological services of the school and community, the home, the classroom teacher, and the remedial teacher. Coordinated efforts similar to this, according to Harris (7), are particularly helpful with cases in which emotional and social problems seem to be blocking progress in learning.

11. Since this clinic was operating at a minimum level in diagnosing the causes of reading disability, additional research considering other factors is needed to determine the effectiveness of the clinic's remedial program.
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TEACHER INVENTORY OF APPROACHES TO TEACHING READING

INSTRUCTIONS: You are asked to evaluate each of the following statements in one of five ways. There are no right or wrong answers and the statements are in no particular order. You are asked to evaluate each statement in relation to how you actually taught reading last year, not how you would have liked to have taught it. If the statement is very inconsistent with the way you taught last year, circle the number 1; if the statement is somewhat inconsistent, circle the number 2; if the statement is neither consistent nor inconsistent with the way you taught last year, circle number 3; if the statement is somewhat consistent with the way you taught, circle number 4; and if the statement is very consistent with the way you taught, circle number 5. Please evaluate and answer each statement.

1. Each pupil was given individual tests to determine his reading level.
2. An adopted basal reading series was used to provide a systematic program of instruction.
3. A profile of errors was made for each child from the individual test results and from observations during the individual testing.
4. Frequently pupils worked by themselves on assigned practice activities in their workbooks while I worked with other pupils.
5. Children were grouped according to their general reading level as determined by their ability to read in a basal reader.
6. Plans for teaching pupils were based on the profiles of errors obtained from the individual tests.
7. Much variety in drill and practice work was used that was fun to do without losing the fundamental purpose.

8. A teacher’s manual for the reading series being used was followed closely.

9. Games were used frequently during the reading lessons.

10. Workbooks that accompanied the basal reading series were used.

11. A variety of reading material with which the child could be successful was used for instruction regardless of the basal series available.

12. Practice in phonics and word attack skills stressed in the basal series manual was given regularly.

13. Pupils were taught in groups that numbered from five to seven.

14. Isolation and analysis of each pupil’s difficulties were made as they were observed during oral reading, and specific instructional techniques were then used to correct them.

15. Supplementary reading was assigned in books frequently that related to social studies or science.

16. The reading group was expected to complete the basal reader that had been assigned to the group before a new basal was presented.
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