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Source: *The Journal of Educational Research*, Vol. 48, No. 8 (Apr., 1955), pp. 565-578

Published by: Taylor & Francis, Ltd.

Stable URL: <http://www.jstor.org/stable/27529748>

Accessed: 30-06-2016 20:29 UTC

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# A STUDY OF DIAGNOSTIC AND REMEDIAL PROCEDURES IN A READING CLINIC LABORATORY SCHOOL

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## Purpose of the Study

THE MAJOR purpose of this study was to analyze the program of instruction provided at the Reading Clinic Laboratory School of Temple University. The full-time remedial program for a group of children with specific disability in reading and related language areas was considered. In order to analyze the program and provide a basis for recommendations to improve the clinic services, answers were sought to these questions:

1. What were the characteristics of these cases at the time of analysis of their problems?
2. What additional characteristics of cases of severe reading disability were revealed during instruction?
3. What types and degrees of progress were made as a result of instruction?

Consideration of the characteristics of cases of the type studied and the progress made by such cases resulted in suggestions for the following: analysis of cases of specific reading disability, instructional work with such cases, work in the regular classroom, and responsibilities of parents. In addition, the need for further research in various areas was indicated.

Data obtained at the time of analysis were examined for all of the one hundred nine pupils who attended the Laboratory School at any time from its opening during the fall semester of 1945 to June, 1951. From these cases were selected, for intensive study, the thirty-four full-time students who attended at any time during the period from June, 1948, to June, 1951.

## Procedures

Two major steps were taken in obtaining the data on these thirty-four cases. The first was to examine the findings at the time each was brought to the clinic for analysis of his reading disability. The second was to examine the daily instructional records kept for these cases during their time at the Reading Clinic Laboratory School.

A report of the findings at the time of analysis and a running account of the activities, accomplishments, difficulties, and reactions of each child were prepared in the form of complete case studies. In addition, the findings for the group were compiled. On the basis of the information about the individuals and the group, recommendations for the handling of such cases were made.

### Summary of Findings

No control group was used as a basis for comparison of the data on these thirty-four cases with a "normal" group or any other group of retarded readers. Certain characteristics of these cases and certain of their reactions to remedial instruction, therefore, could not be judged as to significance. However, the cases studied intensively seemed to have some characteristics in common.

### Characteristics Revealed at Analysis

**Case history:** Thirty-seven different positive findings were included in the thirty-four reported case histories, admittedly inadequate in some cases. The range in individual cases was from no positive findings to ten. On 90.9% of the cases one or more of these findings were reported. Social and emotional maladjustments were reported in 67.6% of the cases; serious or recurring illness, 64.7%; retardation in language development, 41.2%; positive factors in birth date, 35.3%; serious accidents involving head injuries, 20.6%.

**Chronological age:** The average age at the time of analysis was 11 years, 4 months; at entrance to the Laboratory School, 11-10. The range of ages at analysis was from 7-6 to 18-3; at entrance to the Laboratory School, 8-2 to 18-9.

**Sex:** Of the thirty-four cases 67.6% were boys; of the twenty-three remedial cases, 87%; of the eleven corrective cases, 27%.

**Capacity:** Four major tests were used to appraise general capacity: the Stanford Binet, Grace Arthur Performance Scale, Wechsler Bellevue, and Wechsler Intelligence Scale for Children. The range of I.Q.'s derived from these tests was from 73 to 141. The criteria for admission to the school include indications of normal or better intelligence. Therefore, with three exceptions, (I.Q.'s 86, 81, and 88), there was no child in this study who did not have an I.Q. of at least 90 on one of the tests administered. Verbal and performance scores were compared for each case in which both types of tests were administered. The range of difference was from 29 points superiority for the performance I.Q. to 19 points superiority for the verbal. 43.5% of the remedial cases and 30% of the corrective had performance scores at least ten points higher than the verbal. 17.4% of the remedial and none of the corrective had

performance scores more than ten points higher than the verbal.

Of the twenty-eight cases who had the Binet and tests of associative learning ability, on the Gates Associative Learning Tests 75% had some score lower than the level of expected achievement indicated by the Binet. All these pupils had inadequate scores on the tests requiring association of a wordlike form with meaning presented visually. Introduction of auditory stimuli and substitution of geometric figures for the wordlike both brought fewer inadequate performances. On the Detroit Verbal Opposites Test, 60.7% scored lower than would have been expected from the mental age levels attained on the Binet.

Comparison of the results of tests of memory span with Binet mental age, for the twenty-eight cases having these tests, revealed lower scores on the tests of memory span for auditory unrelated materials in 96.4% of the cases, for digits reversed in 85.7%, for auditory related materials in 78.6%, for visual letters in 78.6%, and oral directions in 71.4%, for digits forward in 67.9%, and for visual objects in 28.6%. In general, retention of visual stimuli was superior to retention of auditory; of non-verbal materials, superior to verbal; of related materials, superior to unrelated materials.

Vision: Vision was inadequate in some respect, as tested by the Betts Visual Sensation and Perception Tests, in 61.8% of the thirty-four cases. On tests of visual acuity at near and far point, some inadequacies were shown by 37% of the twenty-seven on whom the tests were used. Of the twenty-seven tested for near point of convergence, 48% failed to meet the standard of 2 inches. At the time of analysis 67.6% of the thirty-four cases wore no correction; 20.6%, correction for near point activities; 11.8%, correction for all activities. After referral, 61.8% wore corrections.

Hearing: 82.4% of the group had satisfactory auditory acuity according to an individual audiometer test. 11.8% had losses in the main speech range (256 to 2048); 8.8% below the speech range (128 or below); 14.7% above the main speech range (4096 to 11584).

Visual and auditory discrimination: Of the thirty-one cases tested in visual discrimination of word and letter forms, 87.1% showed deficiencies; of the eighteen tested in auditory discrimination of speech sounds, 77.8%.

Laterality: Of the thirty-two cases given tests of lateral preference for activities of hands and eyes, 43.8% showed clearcut preference for one side for activities of the hand and eye. 40.7% preferred the right hand and right eye; 37.6%, the right hand but not the right eye; 3.1%, the left hand and left eye; 9.4%, the left hand and the right eye. 9.4% had no clearcut hand preference, 6.3% preferring the right eye and 3.1% the left eye. Of the thirty-two cases tested on the Van Riper Form Board, 93.8% showed evidence of some confusion in "central" dominance.

**Social and emotional adjustment:** According to parental responses to the Social Adjustment Inventory, physical symptoms of maladjustment were present (nail biting in 54.8% of the cases rated; nervous mannerisms, 43.8%; enuresis, 32.3%). There were indications that the parents felt that desirable characteristics were stronger in the children than were undesirable ones. Of the desirable characteristics listed, fifteen were considered present in more than 70% of the cases rated; none was considered present in less than 30% of the cases. Of the undesirable characteristics listed, twelve were considered present in less than 30% of the cases rated; none was considered present in more than 70% of the cases. The average percentage of cases rated in which desirable characteristics were considered present was 70.5%; undesirable characteristics, 38.3%. Parental responses to the Merrill Palmer Rating Scales resulted in mean percentile ranks which deviated significantly from the average in only two areas - 22.9th percentile for Independence of Adult Attention and Affection, and 74.4 percentile for Sociability with Children. In addition, 54.3% of the cases were rated significantly low in Compliance with Routine. The children's responses to the Brown Personality Inventory for Children placed 41.7% of the twenty-four tested above average in adjustment and 45.8% below average.

**Reversal tendencies:** 97.1% of the cases made some reversal errors in reading, writing, or visual discrimination activities.

**School progress record:** Of the thirty-four cases, 38.2% had been promoted each year, 52.9% had repeated one half grade or more, 8.8% had been placed in special classes or schools instead of repeating. The number of grades repeated ranged from one half to three. Of those who repeated, 44.5% did so before going beyond first grade; 55.6%, between second and middle fourth grade. Of those who had repeated one of the earlier grades, 11.1% repeated beyond fourth and repeated more than one grade.

**Achievement:** Of the thirty-four cases, 76.5% were ready for instruction in reading only at preprimer level. The highest level at which instruction was recommended for anyone in the group was second reader level.

17.6% of the cases did not recognize, in an untimed test, all of the words at preprimer level presented in a word recognition test. The median level at which all were recognized was primer. Only two pupils recognized all at third. When there was a flash presentation of the words, the range of levels at which at least 92% of the words were recognized was from none to second reader level. 35.3% of the cases had less than 92% recognition even at preprimer. Only one (2.9%) recognized 92% of the words at second reader level. The median immediate recognition level was preprimer.

In spelling, independent levels ranged from none to third grade level with a median at the zero level. The instructional levels ranged from none to sixth grade level with a median at first grade level. Comparison

of instructional levels in reading and spelling revealed that eleven cases had instructional levels in spelling no higher than those in reading. For the other twenty-three cases, instructional level in spelling was above that in reading.

Comparison of instructional levels in reading and grade scores on standardized tests showed that, without exception, the grade scores were well above the reader level at which instruction was needed. The spread of scores varied from 5.3 grade levels for the twenty-three cases needing instruction at preprimer level to 1.9 for two cases needing instruction at second level.

**Referrals:** In eighteen of the thirty-four cases, recommendations were made for further examination by specialists. Recommendations for sixteen were for visual examination; seven, neurological; three, complete physical; three, endocrine; two, otological, one, psychological.

#### Characteristics Revealed During Instruction

**Social maladjustments:** Five evidences of social maladjustment appeared repeatedly in the instructional records of the group. Of the thirty-four cases 82.4% showed one or more of these symptoms of difficulty. 64.7% evidenced, to a marked degree, more than one of these symptoms. Withdrawal from group activities was present in 61.8% of the cases; prolonged lack of leadership, 55.9%; inability to cooperate with peers, 44.1%; avoidance of peers by seeking adult society, 32.4%; attempts to dominate younger children, 8.8%.

**Emotional maladjustments:** Thirty-one different manifestations of emotional maladjustments seemed to stand out in the instructional records. They were grouped into ten classes. All thirty-four cases showed marked evidence of some of these maladjustments. The range of specific manifestations was from three to twenty-three, representing from one to eight of the ten classes. Most common among the evidences of emotional maladjustment were signs of extreme need for attention and affection, occurring in 85.3% of the cases; marked fear of failure, 67.7%; avoidant reactions to work situations, 64.7%; extreme difficulty in maintaining attention, 44.1%; undesirable reactions to books, 44.1%. Other evidences of maladjustment, in order of decreasing frequency, were inability to evaluate themselves and their work, inconsistency in effort and accomplishment, marked insecurity about their own ideas, ego-centric orientation, and marked sibling rivalry.

**Learning difficulties:** Thirty-two of the thirty-four cases (94.1%) were deterred in their progress by influences which gave them marked difficulty in learning. The most common interferences with learning were poor attitudes and practices on the part of the parents in 52.9% of the cases; a letter-by-letter approach to word learning or inability to distinguish syllables, both affecting negatively the learning and use of tactile and kinaesthetic techniques, in 52.9%; poor habits which had been

established previously in approach to reading, 32.4%; serious setbacks in ability as a result of vacations away from school and instruction, 32.4%. Other negative influences were serious problems with retention, continuing personal maladjustment, inadequate rest and energy, superficial work provided, deficiencies in background of experience, and interference of preconceived ideas and the persistence of errors.

Referrals: On the basis of observations and continuing analysis at the Laboratory School, recommendations were made in twelve cases for visual examination; four, endocrine; four, psychological or psychiatric; two, complete physical.

Parental attitudes: Twenty-one of the cases (61.8%) seemed to be hampered by the attitudes and reactions of their parents. Six (17.6%) appeared to be greatly aided by the understanding and cooperation of their parents. Of outstanding importance as negative influences were pressure for achievement, occurring in 38.3% of the cases; encouragement of dependence, 26.5%; personal conflicts within the home, 20.6%. Lack of attention to rest and health, lack of attention and affection, and failure to provide broad experiences also operated as negative influences.

### Types and Degree of Progress

Achievement: After instruction, the thirty-four cases had a range of instructional levels in reading, as established by an Informal Reading Inventory, from primer to seventh reader level with a median at fourth. This was an increase of five reader levels over the median instructional level at the time of analysis.

On a test of words presented in isolation, the range of levels at which 100% of the words were recognized in an untimed presentation was from primer to third (highest tested), with a median at third. This was an increase of at least four reader levels. Because word recognition ability was not tested beyond third reader level, the median scores after instruction are not necessarily valid.

In spelling, independent levels ranged from zero to sixth grade level with a median at second; instructional levels, from first to seventh grade level with a median at third. This represents an increase of one grade level over the median independent level at analysis; more than one grade level in instructional.

Comparison of instructional levels in reading and spelling revealed that five cases had instructional levels in spelling higher than in reading. Nineteen cases had instructional levels in spelling at the same level as in reading on one level lower. Ten cases had instructional levels in spelling more than one level lower than in reading.

Comparison was made of grade scores achieved in standardized tests and instructional levels determined by the Informal Reading Inventory. In thirty-two of the thirty-four cases, scores ranged from below

the instructional level to considerably above. In the other two cases all scores were above the instructional level. The range of scores achieved by pupils at each of the various instructional levels was from .7 for one pupil at first reader level to 6.2 for six cases at fifth level and for two cases at seventh.

### Attitudes

Changes of attitude and adjustment occurred in all of the cases. In all in which there had been severe problems in related areas, there were notable signs of increased independence in directing home and school activities, of greater self-confidence and belief in ability to succeed, of alleviation of undue dependence of adults, and of increased ability to cooperate with their peers. Other signs of improved adjustment shown by 75% or more of those with serious related problems were development of ability to participate in group situations, establishment of suitable standards for judging work, development of ability to take and accept criticism, development of ability to sustain attention and contact with the present, increased ability to recognize one's own attention-getting actions and substitute positive means of getting attention, and development of greater consistency in accomplishment and effort. Other signs of improved attitudes and adjustments were the development of the habit of independent reading, appearance of a desire to return to a regular classroom, increased evidence of qualities of leadership, increased ability to face situations realistically, expansion of interests and ability to express interest, and development of ability to judge and support one's own ideas.

### Relationships Among Findings

Certain points should be noted particularly in comparing the findings at analysis and those in the course of the instructional program. First, although the parents of all of these children were sufficiently concerned about their problems to bring them for testing and arrange for remedial instruction, 61.8% of the children were held back rather than helped in their instructional work by the attitudes of their parents. Second, social and emotional maladjustments seemed much more serious, according to observation during instruction, than had been indicated at the time of analysis. Third, lack of facility in oral language seemed more apparent during instruction than it had during the testing. Fourth, although spelling achievement had been somewhat higher than would have been expected at the time of analysis, gains in this area were not correspondingly high.

### Conclusions

The conclusions which can be drawn from this intensive study of



thirty-four seriously retarded readers must be considered in view of three major limitations. First, no control group was used as a basis for comparison of the data on these thirty-four cases with a "normal" group or any other group of retarded readers. Therefore, it is impossible to determine the significance of certain findings. Second, instruction is provided by both fully trained personnel and graduate students learning specific remedial techniques. The fact that at certain periods the major part of the instruction is by graduate students may have an influence on the results obtained. Third, criteria for admission to the school, as well as economic factors, limit the group. However, within the limitations of this study, the conclusions enumerated seem valid.

#### Characteristics Revealed At Analysis

**Case history:** Data obtained on the histories of these cases were not always complete and entirely accurate. However, the indications are that case histories of many severely retarded readers contain data which may indicate causative or contributing factors to the disability. Most common, as possible causes of difficulty, are social and emotional maladjustments, serious or recurring illness, retardation in language development, injury or illness at birth and head injuries. Minimal brain damage may be important in many cases of reading disability.

**Chronological age:** Clinical testing to determine the nature of reading difficulty rarely occurs before normal age for entering third grade. On the average, children are of normal age for completion of elementary school before clinical instruction is sought.

**Sex:** Among cases of extreme reading retardation as many as two thirds might be expected to be boys. Among those with severe associative learning disabilities, an even higher percentage would likely be boys.

**Capacity:** Severe reading disability cases may be deterred by factors other than limited intelligence. There is a tendency for such cases to do better with performance than with verbal items on general capacity tests.

Severe reading disability cases tend to have difficulty in making associations with visual symbols or associating words with their opposites. Particular difficulty is encountered with formation of associations with wordlike figures when all stimulation is visual.

Deficiencies in memory span appear to be an outstanding characteristic of severely retarded readers. Span for pictured objects appears to be adequate in most cases. The order of difficulty of memory span tests, from most to least difficult, appears to be auditory unrelated, digits reversed, visual letters, auditory related, oral directions, digits forward, visual objects. Span for non-verbal materials tends to exceed that for verbal; for related materials, that for unrelated.

Vision: Cases of specific reading disability do not differ significantly from the normal population in visual status. Certain previously undetected visual inadequacies may have added to the difficulty and discomfort of these cases in sustained reading activities.

Hearing: Losses in auditory acuity do not appear to be characteristic of cases of specific reading disability.

Visual and auditory discrimination: Deficiencies in ability to make visual discriminations of word and letter forms and in ability to discriminate certain speech sounds appear to be characteristic of severely retarded readers.

Laterality: Peripheral dominance characteristics do not appear to be significantly different among retarded readers and in a random sampling of the population. Confusion in "central" dominance appears to be characteristic of specific reading disability cases.

Social and emotional adjustment: Physical symptoms of disturbance appear to occur frequently in specific reading disability cases. Parental responses to rating scales and inventories tend to picture the child as well rather than poorly adjusted. Pupil responses tend to rate the individual as above or below average rather than at average. Ratings obtained from parents and from the subjects tend to be at variance.

Reversal tendencies: Virtually all children with specific reading disability tend to make reversal errors in reading, spelling, and/or visual discrimination activities. They appear to be symptoms of difficulty, not causal factors.

School progress record: Repeating of grades is apparently an unsuccessful means of helping children overcome specific reading disability. Most repeating tends to be done before third grade. In spite of normal or better intelligence, children with severe reading disabilities are sometimes placed in schools or classes for children of less than normal intelligence.

Achievement: Subjects for whom intensive remedial instruction is sought tend to be ready for instruction only at preprimer level. They tend to recognize immediately, with adequate accuracy, only words at preprimer level and, with unlimited time, only words to primer level. They tend to have no independence in spelling, being ready for instruction only at first grade level. Their standardized test scores tend to place them well above the level at which they are ready for instruction.

Referrals: Study by vision specialists, neurologists, and other specialists is frequently necessary in addition to the analytic study done at a reading clinic.

#### Characteristics Revealed During Instruction

Social maladjustments: Children with severe reading disabilities tend to evidence difficulty in maintaining adequate social relationships. The degree to which this difficulty appears and the number and kinds of

manifestations of it vary greatly from case to case. At least in cases of severe reading disability a child's actual social adjustment as observed in his daily activities tends to be considerably less adequate than that pictured by his or his parents' responses to social adjustment inventories.

Emotional maladjustments: Every child who works under the handicap of a severe reading disability appears to evidence at least some marked emotional maladjustments. The degree of the maladjustment and the particular evidences of it vary greatly from case to case. The degree of emotional maladjustment reflected in the observations made in the course of instruction tends to be considerably greater than that indicated in personality and adjustment inventories to which parents and subjects responded at the time of analysis.

Learning difficulties: The following appear to make learning difficult for extremely retarded readers: poor parental attitudes and practices, interferences in the learning and use of the tactile and kinaesthetic techniques, oral language difficulties, poor habits established through instruction, vacations away from school and instruction, continuing problems with retention, personal maladjustment, inadequate rest and energy, superficial work, deficiencies in background of experience, perseverance.

Referrals: Need for additional examination and/or treatment by specialists, beyond that recommended at analysis, frequently appears.

Parental attitudes: Parental attitudes and practices may have a strong positive effect on adjustment and progress or a strong negative effect. Many children with severe reading disabilities appear to be hampered rather than helped by parental reactions.

### Types and Degree of Progress

Achievement: Both the degree and the rate of progress made by cases of specific reading disability vary considerable from case to case. Accuracy of measurement of word recognition ability has been limited by failure to test above the third reader level. Gains in reading and word recognition appear to be greater than those in spelling. Indications are that gains in standardized test scores accompany other signs of progress but are not as great as the gains on informal tests. Standardized tests, after remedial instruction, tend to yield scores from below to well above the instructional level in reading.

Attitudes: Increased confidence, independence and self-direction seem to characterize the changes in attitude resulting from remedial work. These changes seem to allow the child to participate more actively and to maintain more effective contact with their peers and with reality.

### Recommendations

On the basis of the results and conclusions of this study, certain recommendations can be made for the improvement of analysis and instruction in cases of specific reading disability. In addition, there are further recommendations for the regular classroom, for parents, and for additional research.

#### Analysis of Specific Reading Disability

1. More nearly accurate and complete case histories should be obtained as background for the analysis of severe reading disabilities.
2. Both the school personnel and parents should seek complete diagnosis of suspected reading disability cases earlier than has been the case.
3. Both verbal and performance type tests should be used to appraise the general capacity of cases of suspected reading disability.
4. All reading disability cases should be tested for ability to make associations. More discriminating tests of this ability should be built.
5. Complete visual screening should be included in the analysis battery for all reading disability cases.
6. All reading disability cases should be tested thoroughly for ability to discriminate letter and word forms and speech sounds.
7. When there are evidences that the subject is responding to inventories in such a way as to hide his true feelings and reactions, additional investigation of personality should be included in the testing. Projective techniques will probably offer the best possibility of getting at the true adjustment picture.
8. Clinical observation and patterns of findings, from capacity tests, indicating difficulty with attention and concentration or other symptoms of maladjustment should be considered in the general evaluation of adjustment and need for further study.
9. Better means of getting parental evaluations of the subject's adjustment should be sought. Teacher-evaluations should be added to the information on such cases.
10. Tests of word recognition ability beyond the third reader level should be included in the analysis battery.
11. Standardized tests should be chosen so that the subject does not tend to achieve at either the upper or lower levels of the test and so that they can be followed with successively higher

- level tests which yield comparable scores.
12. Specific recommendations should be made for further examination and study whenever there are indications of difficulties in vision, hearing, general health, neurological status, emotional status, etc. A list of competent specialists who are willing to serve as consultants on reading disability cases should be maintained in the Reading Clinic and referral made to the appropriate person.

#### Instructional Work With Cases of Specific Reading Disability

1. All staff members of the Reading Clinic Laboratory School should have courses in the following areas as well as basic courses in the psychology and teaching of reading: personality, vision, hearing, phonetics, analysis of reading disabilities, child development, and curriculum.
2. Consultants to the staff should include competent vision specialists, otologists, speech specialists, neurologists, clinical psychologists and psychiatrists, pediatricians, and endocrinologists. Whenever difficulties are suspected because of observations and/or screening tests, cases should be referred to one of these specialists.
3. To provide continuity of growth in the school as a whole and the best possible program of instruction, research, and training of graduate students, there should be a permanent supervisory staff at the Laboratory School.
4. Graduate students should not be admitted for study at the Laboratory School unless they have completed the basic courses in reading and half the work on analysis of reading disabilities with better than average scholarship and clinical performance.
5. Psychotherapy by professionally trained personnel should be provided by the addition of such specialists to the Laboratory School staff. A system should be initiated which would provide for adequate observation periods in the school and, subsequently, regular periods for individual or group therapy. The person providing this service should have no administrative or supervisory responsibilities in the school.
6. Careful follow-up of analysis information should be a regular part of the instructional program. Systematic checks should be made on the outcome of referrals made as a result of the analysis. Tests and inventories in all areas should be repeated periodically and at the end of instruction to determine any changes of pupil status.
7. Particular attention should be given to the development of visual and auditory discrimination abilities and the over-

- coming of reversal tendencies.
8. Emphasis should be placed on helping the child to effect more satisfactory social and emotional adjustments.
  9. Closer contacts should be maintained with the parents and recommendations made for adjustments in parent-child relationships.
  10. Closer contacts should be maintained with the schools from which children have come to the Laboratory School or to which they are to return.

#### Recommendations for the Regular Classroom

1. More adequate programs of observations and screening tests should be employed so that the child with a specific reading disability can get help sooner than he usually has in the past.
2. Judgments about a child's degree of retardation in reading should be made only in terms of reliable indices of his general capacity as measured by both verbal and performance items.
3. Instruction must be planned so that the child is not given work at a level beyond that at which he should be working. Greater emphasis should be placed on developing adequate readiness for reading before initial reading activities are begun.
4. Emphasis on reading as a meaningful process should be maintained.

#### Recommendations for Parents

1. Parents should be alert to all signs of difficulty the child is encountering - physical, psychological, academic - and should seek to discover the causes of the problems.
2. Practices such as exerting undue pressure for achievement, encouraging dependence, or denying the child needed attention and affection should be avoided.
3. Parents should maintain an interest in the child's work, an understanding of his problems, recognition of his improvements and a program for helping the child to extend his experiences. Responsibilities which the child can handle should be given to him and followed through.

#### Recommendations for Additional Research

1. There should be further investigation of the relationships between case history data, "central" dominance, social and

emotional adjustment and specific reading disability.

2. More nearly adequate tests in the following areas should be developed: associative learning ability, auditory discrimination of speech sounds, achievement as measured by both formal and informal tests (especially to get comparable forms).
3. Retesting, after remedial instruction, should be carried on to determine the effects of the intervening period on general capacity, associative learning ability, memory span, "central" dominance, and social and emotional adjustment.
4. A systematic program of follow-up on cases should be carried out to determine the effects, on a long-term basis, of remedial instruction on adjustment in subsequent school work and in personal adjustment.