

A STUDY OF THE DOMAN-DEACATO NEUROLOGICAL APPROACH
AND ITS APPLICABILITY TO THE TREATMENT OF READING DIFFICULTIES
APPEARING IN THE REMEDIAL READING PROGRAM OF
OAKDALE ELEMENTARY SCHOOL, SALINA, KANSAS

by *500*

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CHAPTER I

THE PROBLEM AND DEFINITIONS OF TERMS

Remedial teaching is expensive--too expensive to be applied in a wholesale manner. What is needed in American education is a basic philosophy that will make it possible for educators to offer what is best for all children--a program that will make self-realization and maximum use of potentialities a reality for every child.¹ In the light of the forestatements by Cutts the neurological approach to the diagnosis and treatment of reading problems advocated by Dr. Carl Delacato is an approach which merits further study and evaluation by educators.²

I. THE PROBLEM

Statement of the problem. It was the purpose of this study (1) to use three of the Delacato techniques, cross-pattern creeping, cross-pattern walking and the correct sleep position, in addition to the usual remedial procedures, in the treatment of the reading difficulties identified in four boys coming to the reading room at Oakdale School, Salina, Kansas;

¹Warren G. Cutts, Modern Reading Instruction, (Washington, D. C., The Center for Applied Research in Education, Inc., 1964), p. 3.

²Carl Delacato, The Diagnosis and Treatment of Speech and Reading Problems (Springfield, Illinois: Charles C. Thomas, 1964).

(2) to evaluate the effectiveness of this approach through pre- and post-standardized testing and informal observation; and, (3) to make a judgment as to the advisability of expanding this approach to include more of the disabled readers coming to the reading room.

Importance of the study. The prevalence of reading disability in our schools is surprising in view of the time, energy and money devoted to the teaching of this subject. Reports show that from ten to twenty-five percent of the pupils in our schools are seriously retarded and a large portion of these are disability cases.³ It is important that every avenue of help for these unfortunate children be thoroughly explored.

Limitations of the study. This study was limited to (1) three neurological techniques; (2) four boys with reading disabilities from Oakdale School, Salina, Kansas; and (3) evaluation by pre- and post-standardized tests in reading.

II. DEFINITIONS OF TERMS USED

Alexia. Word blindness--any condition that makes it impossible for a child to read, which is accompanied by structural defects in the cerebrum.⁴

³Guy L. Bond and Miles A. Tinker, Reading Difficulties; Their Diagnosis and Correction (New York: Meredith Publishing Co., 1967), p. 17.

⁴Emerald V. Dechant, Improving the Teaching of Reading (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1964), p. 57.

Biaural. Independent use of each ear.⁵

Biocular. Eyes are used alternately and rarely in concert.⁶

Binaural. Fusion of sound stimuli received simultaneously by the two ears.⁷

Binocular. Use of both eyes in concert. Eyes are yoked and look at the same object in space simultaneously.⁸

Bilateral. Use of both sides of the body.⁹

Cortex. The outer surface of the brain which contains the nerve cells and most of their inter-connections.¹⁰ (See Figure 1, page 6).

Crossed dominance. The neurological condition existing when the dominant eye and hand are on opposite sides.¹¹

Cross-pattern. A mobility function requiring the use of the opposite arm and leg simultaneously. The body is lifted

⁵Carl H. Delacato, The Diagnosis and Treatment of Speech and Reading Problems (Springfield, Illinois; Charles C. Thomas Publisher, 1963), p. 51.

⁶Ibid.

⁷Ibid., p. 57.

⁸Ibid., p. 55.

⁹Ibid., p. 57.

¹⁰Samuel Torrey Orton, Reading, Writing and Speech Problems in Children (New York: W. W. Norton and Company Inc., 1937), p. 207.

¹¹Albert J. Harris, Harris Tests of Lateral Dominance, Manual (New York: The Psychological Corporation), 1958.

off the floor and the head and neck are turned toward the forward hand.¹² (See Figure 2, page 28).

Cross-pattern walking. An extension of cross-pattern creeping. The right foot and left hand move forward simultaneously with the head and neck turned slightly toward the forward hand.¹³ (See Figure 2, page 28).

Disabled reader. One who is one to four years below grade level.¹⁴

Directionality. Awareness of right and left outside the body.¹⁵

Homolateral crawling. Movement with the body in contact with the floor and propulsion by flexing the arm and leg on the same side of the body, with the arm and leg on the opposite side extended.¹⁶

Lateral dominance. The preferred use and superior functioning of one side of the body over the other.¹⁷

Maturation lag. Slowness in attaining various degrees of development.¹⁸

¹²Delacato, op. cit., p. 58.

¹³Delacato, op. cit., p. 58.

¹⁴Bond and Tinker, op. cit., p. 9.

¹⁵Albert J. Harris, How to Increase Reading Ability (New York: David McKay Co., Inc., 1961), p. 249.

¹⁶Delacato, op. cit., p. 49.

¹⁷Harris, loc. cit.

¹⁸Delacato, op. cit., p. 21.

Medulla. The lowest level of the brain; controls primitive reflexes.¹⁹ (See Figure 1, page 6).

Mid-brain. The area of the brain which mediates and integrates the later functional activity of the cortex.²⁰ (See Figure 1, page 6).

Mixed handedness. Neither hand is dominant.²¹

Mylenization. The covering of each brain cell with a fatty sheath as insulation to prevent crossing or short circuitry of neural pathways.²²

Neurological organization. "That physiologically optimum condition which exists uniquely and most completely in man and is the result of total and uninterrupted ontogenetic neural development."²³

Ontogeny. The life cycle of a single organism; biological development of the individual.²⁴

Phylogeny. The racial history or evolutionary development of any plant or animal species.²⁵

¹⁹Delacato, op. cit., p. 47.

²⁰Ibid., pp. 52-53.

²¹Harris, op. cit., p. 20.

²²Don Eugene Kluttz, from an Address given by Mr. Kluttz at an Orientation Session for Parents at the Institute for the Achievement of Human Potential, Kansas City, Missouri, November 20, 1968.

²³Delacato, op. cit., p. 4.

²⁴Webster's New World Dictionary of the American Language, College Edition (Cleveland and New York: The World Publishing Co., 1960), p. 1026.

²⁵Ibid., p. 1104.

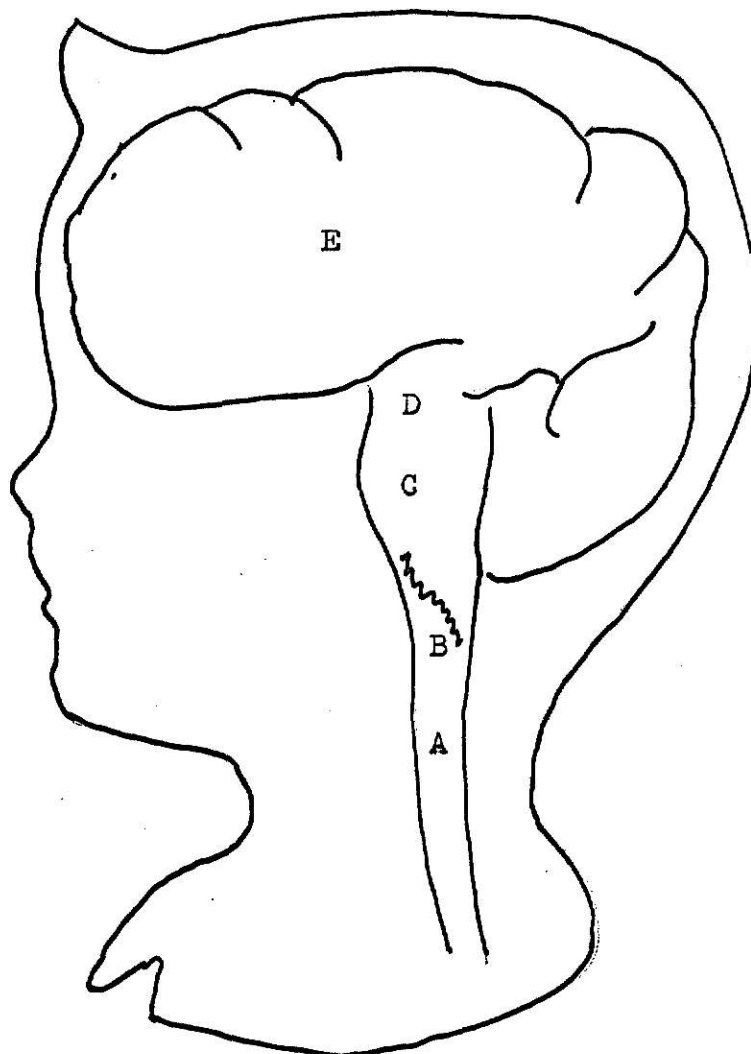


Figure 1--Parts of the brain and neurological function controlled by each part.

- A---Spinal cord, center of crude trunkal movement
- B---Medulla, seat of involuntary neck reflex
- C---Pons, controls crawling
- D---Mid-brain, controls creeping
- E---Cortex, brain center for walking and talking

Pons. The level of the brain just higher than the medulla, the physiological center of the tonic neck reflex, which is used functionally by an infant for crawling.²⁶

Stereopsis. "The perception of the third dimension in objects so that they appear as solids instead of as flat pictures."²⁷

ORGANIZATION OF THE REPORT

Chapter I states the problem and defines the terms used in the paper. In Chapter II there is a review of the literature. Chapter III is devoted to people involved, materials and methods employed to place the goals of the problem in an attainable, workable situation. Chapter IV is concerned primarily with the results of the study and Chapter V contains the summary and conclusions.

²⁶Delacato, op. cit., pp. 48-49.

²⁷Orton, op. cit., p. 214.

CHAPTER II

REVIEW OF THE LITERATURE

Contemporary Educators

No one cause explains all reading failure. It is a many faceted problem requiring the cooperation of many kinds of specialists. Many disabled readers exhibit poor motor coordination. This is evidenced by awkwardness in walking, running, writing, and athletic activities.²⁸

The suggestion that motor incoordination together with reading disability are symptoms of some basic condition such as glandular dysfunction or minor brain injury seems probable.²⁹

As early as 1917 Henschelwood, an English ophthalmologist, examined children who had not learned to read and felt their symptoms were comparable to those of acquired alexia. Because of this similarity he hypothesized the existence of some variety of conjugal alexia. He believed some abnormality of the supermarginal gyri, that part of the brain termed critical for reading, on the side of the brain opposite the dominant hemisphere was responsible, due possibly to birth injuries or sustained disease.³⁰

²⁸Bond and Tinker, op. cit., p. 114.

²⁹Ibid., p. 117.

³⁰Schubert, op. cit., p. 17.

Brain injury may occur at birth or afterwards. During recent years there has been a tendency to place increasing emphasis on this as a causal factor in cerebral dysfunction. Speech difficulties and histories of difficult births among disabled readers suggests the validity of such an approach.

To complicate further the acquiring of academic techniques, children with deviant physiological functioning will perhaps show difficulty in establishing dominance and directionality.³¹

Harris defines lateral dominance as "the preferred use and superior functioning of one side of the body over the other."³² He further states that directionality is the awareness of right and left outside the body and seems to develop after laterality has been established.

Harris feels that in many cases there is a physiological basis for directional confusion. Many children with reading disabilities and directional confusion show an irregular and delayed neurological maturation. Some case histories of such children suggest minimal brain damage, delay in establishing dominance of one hand, strong reversal tendencies, some speech difficulties, and early difficulty in learning to read charac-

³¹Florence Rosewell and Gladys Natchez; Reading Disability Diagnosis and Treatment (New York: Basic Books, Inc., 1964), p. 17.

³²Harris, op. cit., p. 249.

terizing several members of the family, suggesting a familiar growth pattern.

Kephart says that when a child has developed laterality within his own organism and is aware of the right and left sides of his own body he is ready to project these directional concepts into external space.³³

Directionality, then, depends upon laterality and until a good solid laterality is established a child's perception of space will be limited and inaccurate.³⁴

The importance of a stable space world cannot be overestimated. We cannot compare two objects unless we have an adequate space concept in which to place them for comparison. This is important in distinguishing similarities and differences. Similarities and differences are very important to advanced thinking according to Kephart. Concepts, grouping on the basis of characteristics, categorization, and the like all primarily involve dealing with similarities and differences. The importance of such categorizing in the thinking process has been repeatedly pointed out by researchers.³⁵

The Doman-Delacato Rationale. The Doman-Delacato approach to the treatment of reading difficulties was developed

³³N. Kephart, The Slow Learner in the Classroom (Columbus, Ohio, Charles E. Merrill Co., 1960), p. 46.

³⁴Ibid., p. 49.

³⁵L. Welch, "The Transition from Simple to Complex Forms of Learning," Journal of Genet. Psychology, LXXI (1947), pp. 223-51.

by Dr. Glenn Doman, Physiotherapist and Director of the Rehabilitation Center in Philadelphia, his brother Dr. Robert Doman, M. D., Medical Director of the Rehabilitation Center and Dr. Carl Delacato, Ed. D., Director of the Developmental Reading Program at the Institute of Language Disability, Philadelphia, Pennsylvania.

The specific rationale for the neurological approach is that there are four levels of neurological development, namely medulla, pons, mid-brain and cortex, which control body movement and communication.

In Delacato's own words:

Neurological organization is that physiologically optimum condition which exists uniquely and most completely in man and is the result of a total and uninterrupted ontogenetic neural development. This development recapitulates the phylogenetic neural development of man and begins during the first trimester of gestation and ends at about six and one-half years of age in normal humans. This orderly development progresses vertically through the spinal cord and all other areas of the central nervous system up to the level of the cortex as it does in all mammals. Man's final and unique developmental progression takes place at the level of the cortex and it is lateral (from left to right or right to left).³⁶

This is hemispheric dominance, a process of making one cortical hemisphere dominant over the other. When this dominant-subdominant relationship is achieved many communication problems are overcome.

This progression is an interdependent continuum; therefore, if a higher level is incomplete, lower levels become

³⁶Delacato, op. cit., p. 4.

operative and if a lower level is incomplete all succeeding higher levels are affected.³⁷

Phlogenetically the nervous system of man has evolved from the simple to the complex; as evolution progressed animals achieved what could be called a spinal cord. These animals operated at a reflex level. As time went on the mid-brain developed and later the cortex. For an over-view of this phylogenetic development, see Table I, page 19.

The basic difference between man and the animal world is that man has achieved cortical dominance, wherein one side of the cortex controls the skills in which man outdistances lower forms of animals.³⁸

Trauma of this controlling hemisphere results in loss of language skills. The skills by which man outdistances other animals having the same general neuro-anatomical structure are: (1) the ability to stand fully upright, (2) the ability to see three dimensionally, (3) the ability to oppose the thumb and fore-finger, (4) the ability to supinate and pronate the hand, (5) the ability to speak or write a language, and (6) the ability to operate unilaterally with hand, foot and eye of one side of the body.

The basic premise of the neuro-psychological approach as outlined by Dr. Delacato is that

. . . those areas of neurological organization which have not been completed or are absent are overcome by passively imposing them upon the nervous system in those with

³⁷Ibid.

³⁸Ibid., p. 6.

problems of mobility and are taught to those with problems of speech or reading. When the neurological organization is complete the problem is overcome.

Since speech and reading are uniquely human we have focalized upon them in our efforts to educate our children. Speech and reading are the final human result of neurological organization and hence are clinical indices of the nature and the quality of neurological organization of an individual.³⁹

Language in man is the result of the development of his nervous system. Individuals who have good language development have achieved the final lateral progression of the nervous system. Those who have trouble with language in the form of speaking or reading have not achieved this final lateral progression or have not completed the vertical progression.⁴⁰

The progression of neurological organization proceeds vertically to the cortex as mylenization takes place. This progression is chronologically predictable. During gestation and up to the time of birth the spinal cord and medulla oblongata are the extent of neurological organization. Here lie the ancient and primitive reflexes.⁴¹ During birth they continue of prime importance since they reflexly control such vital life-preserving functions as cardio-vascular activity, gastro-intestinal activity and breathing reflexes. At this level mobility is undulating and fish like.

³⁹Ibid., p. 7.

⁴⁰Ibid., p. 27.

⁴¹Ibid., p. 47.

A newborn infant has crude trunkal movement but no mobility. All of his activities are reflex in nature, requiring short and uncomplicated neural pathways. All reactions are of a survival nature.

At about four months of age the infant moves on to the next higher level of neurological organization. This amphibian-like level is the level of the pons, which lies just above the medulla-oblongata. Here we have neural pathways for both visual-motor function and audition. Some of these pathways cross the midline but some do not. The pons is also the seat of the tonic neck reflex. This reflex is used by the infant for propulsion while the body is dragged along. This is crawling and the body remains in contact with the floor. The propulsive movements are homolateral.

At the level of the pons the infant begins to hear himself and the sounds around him. However, he uses his ears independent of each other. Hearing is baural. Vision is biocular. The very position of the eyes in the crawling position precludes their being used together.⁴²

At about six months of age the baby moves into the mid-brain stage of development. This is the area of mediation and integration. He develops mobility in third dimension, creeping. This requires audition binaurally, vision binocularly. He uses functions from both sides of his body in concert in cross pattern creeping. At this stage he develops a prehensile grasp

⁴²Ibid., pp. 48-51.

with which he can manipulate objects.⁴³ According to Donald Kluttz of the institute for Achievement of Human Potential, Kansas City, Missouri, a child's eyes may never work together if his crawling is skipped or shortened.

At about one year of age the child moves from a mid-brain level of functioning to early cortical function. The cortex is responsible for many facets of speech and walking. The child becomes increasingly proficient in bilateral activity. He begins to use hands and arms independently of feet and legs and masters one of his most human functions, walking. There is a fusion of sound reception and the child now starts the process of learning both the receptive and expressive components of speech. His visual performance becomes more complex and he develops stereopsis. He can now begin to deal with visual symbols. This is the beginning of the ability to deal with visual abstractions, which is pre-requisite to learning how to deal with written letters and words.⁴⁴

In his treatment of speech and reading problems Dr. Delacato's diagnostic procedure is as follows:

A. Testing

1. Standardized tests for reading and spelling (diagnostic in nature)
2. Intelligence tests, preferably the Wechsler Intelligence Scale for Children

⁴³Ibid., pp. 52-55.

⁴⁴Ibid., pp. 56-59.

B. History Questionnaire

1. Condition during pregnancy
2. Condition at birth
3. Early development and childhood diseases
4. Mobility and activity levels during first six months
5. Onset and degree of crawling
6. Onset and degree of creeping
7. Age of walking
8. Age of talking
9. Traumatic injuries
10. Sleep pattern
11. Tonality

C. Clinical Evaluation

1. Ascertain whether there is a lack of neurological organization
2. Ascertain specific level at which organization is lacking
3. Establish basal level at which treatment should begin⁴⁵

Treatment, beginning at the necessary level is aimed at optimum development of all areas of the brain and includes stimulation of all the senses. A developmental profile is kept on each child.

Most children in schools have the simple movements which are the province of the spinal cord, the medulla and the pons.

⁴⁵Ibid., pp. 80-84.

It is at the mid-brain level that so called "normal" children with poor neurological organization are seen. The great majority of children with speech and reading problems are poorly organized at the mid-brain level.⁴⁶

To evaluate a child's organization at the mid-brain level Dr. Delacato asks him to creep on the floor on his hands and knees. He should do so in the fashion which is typical for the normal nine month old infant--in cross pattern. His opposite hand and foot should strike the floor simultaneously and his head should turn slightly towards his forward hand. This is reversed for the next step. The child's hands should be palms down flat with fingers pointing straight ahead. Any deviation in this pattern is an indication of lack of organization at this level.⁴⁷

The next level of evaluation is the level of early cortex. Mobility for this level is cross-pattern walking. This is an extension of cross-pattern creeping and may be expressed as an exaggerated natural walking. As a child's right foot moves forward his left arm moves forward and the left hand points slightly at the right foot. The process is reversed on the next step. The left foot and right arm move forward with the right hand pointing slightly toward the left foot.⁴⁸

⁴⁶Ibid., p. 86.

⁴⁷Ibid., p. 87.

⁴⁸Ibid., p. 88.

Children with language problems are categorized as being poorly coordinated. There is a lack of patterning in their walk and they tend to walk in a one sided manner. This type of one sided walking makes running difficult.⁴⁹

At the level of early cortex Dr. Delacato also evaluates a child's ability to supinate and pronate; with arms bent at the elbow the child is asked to hold out his hands and to turn palms up and down repeatedly. A slow performance in this shows disorganization. The child should be able to oppose thumb and forefinger of both hands equally well if he is organized at this level.

The next level of evaluation is that of cortical hemispheric dominance. This is done through a number of tests on handedness, footedness and eyedness. "All of the procedures for the establishment of cortical hemispheric dominance must be followed simultaneously. Each of the areas needs the reinforcement of the others."⁵⁰

Research, pro and con the Delacato Rationale. Laterality and the resultant directionality are not only necessary to advanced thinking but also are basic to a child beginning to read. Kephart says: (See Table I, page 19.)

Without laterality there is no difference between a b and a d; it is not that the child is confused; it is not that he has not learned the difference; it is not that he

⁴⁹Ibid., p. 89.

⁵⁰Ibid., p. 122.

TABLE I
PHYLOGENETIC AND ONTOGENETIC PARALLEL GROWTH PATTERNS⁵¹

| Onto- genetic Develop- ment | Phylo- genetic Develop- ment | Neuro- logical Progres- sion | Mobility | Vision | Audition |
|----------------------------------------------------|---------------------------------------|------------------------------------------------|-------------------------------|---------------------------------------------------------|-----------------------------------------------------------|
| Newborn Infant | Fish | Medulla Ob- longato | Trunkal Movement | Reflex | Reflex |
| 4 Month Old In- fant | Amphib- ian | Pons | Homo- lateral Crawling | Biocu- lar | Biaural |
| 10 Month Old In- fant | Reptile | Mid- brain | Cross- Pattern Creeping | Binocu- lar Yoking | Binaural |
| 1 Year Old In- fant | Primate | Early Cortex | Crude Walking | Early Fusion | Early Stereo- phonic |
| 8 Year Old (Who speaks, reads, writes) | * | Cortical Hemis- pheric Domi- nance | Cross- Pattern Walking | Stere- opsis with Pre- domi- nant Eye | Stereo- phonic with Pre- domi- nant Ear |

* No Parallel

⁵¹Carl H. Delacato, The Diagnosis and Treatment of Speech and Reading Problems (Springfield, Illinois; Charles C. Thomas Publisher, 1963), pp. 66-67.

reverses the letter. The fact is that for this child no difference exists. The only difference between a b and a d is a difference in direction and for this child no directions exist, therefore no differences based on directionality can exist. It is fruitless to attempt to teach this child the complex activities involved in reading as long as he continues to lack this basic skill.⁵²

In early childhood motor activities play a major roll in intellectual development. According to Kephart:

It is logical to assume that all behavior is basically motor and that the pre-requisites of any kind of behavior are muscular and motor responses. Behavior develops out of muscular activity, and so called higher forms of behavior are dependent upon lower forms of behavior, thus making these higher activities dependent upon the basic structure of the muscular activity upon which they are built.⁵³

More than four thousand research studies in reading have been published during the last two generations. Claims, contradictions, charges and counter charges form the matrix of available research data on this subject.⁵⁴

The Doman-Delacato approach to the treatment and prevention of reading problems has been a controversial one.

In the article "A Study of the Validity of Delacato's Theory of Neurological Organization," Melvyn P. Robbins challenges Delacato's claim that reading problems can be treated or prevented by neurological organization.⁵⁵

⁵²Kephart, op. cit., p. 32.

⁵³Ibid., pp. 35-36.

⁵⁴Warren G. Cutts, Modern Reading Instruction (Washington, D. C.: The Center for Applied Research in Education, Inc., 1964), p. 1.

⁵⁵Leo M. Schell and Paul C. Burns, Remedial Reading; An Anthology of Sources (Boston: Albyn and Bacon, Inc., 1968), p. 290.

In this study a second grade classroom from each of three similarly matched schools in Chicago was selected to participate. The children were not selected because of reading or any other difficulty. One class serving as the traditionally control group carried out its normal curriculum. The second class, the experimental group, carried out its regular curriculum and had in addition a program consistent with Delacato's theory. A third class was subjected to activities not known to be correlated with reading in addition to its regular curriculum.

Although random techniques could not be employed either to select or assign students the groups appeared reasonably matched in race, religion, socioeconomic level, age, intelligence, creeping and laterality. Significant differences across the three groups did occur in reading and in arithmetic pre-test scores. These differences were partially controlled by using covariance analysis.⁵⁶

The program was administered by the classroom teacher and two assistants one-half hour before school and by the parents at home. The investigator averaged one visit per week to each class. At the conclusion of the study all three groups took reading tests. The experimental group was tested in arithmetic and laterality.⁵⁷ No statistical differences were

⁵⁶Ibid., pp. 29-292.

⁵⁷Ibid., p. 293.

found in favor of the experimental group. Fewer children were lateralized at the end of the study than at the beginning.

On the basis of the study Mr. Robbins advises caution in the application of this theory to regular classrooms.⁵⁸

In a statement for the public the executive boards of the American Academy of Pediatrics and American Academy of Neurology had this to say: "To our knowledge, no controlled studies are available to support the greater value claimed for the program (Doman-Delacato) as compared with conventional treatment of the neurologically handicapped child. Without such studies, a medically acceptable evaluation is not possible."⁵⁹

In a study written up September, 1966, under the auspices of the Bureau of Research, Area of Research and Development, Department of Public Instruction, Commonwealth of Pennsylvania, John R. Kershner and David H. Bauer, principal investigators, concluded: "The Neuropsychological Theory of Doman-Delacato and Perceptual-Motor Theory of Kephart could be potentially useful to educators. At the present time (1966),

⁵⁸Ibid., p. 299.

⁵⁹"Joint Executive Board Statement American Academy of Pediatrics and American Academy of Neurology, Doman-Delacato Treatment of Neurologically Handicapped Children," from an article in Exceptional Children (n.d. from ERIC) (reprinted) from Neurology, Vol. 17, July, 1967) by permission from all concerned.

however, no conclusive experimental evidence exists to reject or accept hypothesis deduced from either theory."⁶⁰

In an article in Exceptional Children, Kershner discusses a study conducted in 1967 in two schools of the Northern Lehigh School District, Lehigh County, Pennsylvania, with trainable mentally retarded children as subjects. There were sixteen control and fourteen experimental subjects. Criterion for admittance to the class was not I. Q., but inability to cope with academic requirements of the educable grouping. The experiment was in effect Mondays through Fridays, November 1, 1966, to February 28, 1967. There was an interruption of the schedule for both Thanksgiving and Christmas holidays since no parental cooperation was asked.

The findings suggested that the Doman-Delacato techniques may be beneficial with trainables in public schools.⁶¹

Julia M. Penn states in an article published in December, 1966 that research findings "lend weight to the idea of a reproductive causality ranging from neonatal death through cerebral palsy to behavior and learning deviations to normal. She further states that educators who realize that reading

⁶⁰ John R. Kershner and David Bauer, Neuropsychological and Perceptual-Motor Theories of Treatment for Children with Educational Inadequacies (The Bureau of Research, Area of Research and Development, Department of Public Instruction, Commonwealth of Pennsylvania), September, 1966.

⁶¹ John R. Kershner, "Doman-Delacato's Theory of Neurological Organization Applied with Retarded Children," Exceptional Children (February, 1968), pp. 441-450.

disability is, in most children, due to a neurological impairment, will implement techniques designed for the brain damaged, the perceptually impaired, and the dyslexic child."⁶²

There have been other articles published which take less favorable views of the Delacato Theory than those cited here. Unfortunately they were not available to the writer. Among these articles are: Perkins F., Theodore, "Problems Arising from Assertions or Assumptions of Delacato," Reading and Emerging Social Values, (28th Yearbook of the Claremont Reading Conference, Malcolm P. Douglas (ed.), Claremont, California, 1964.), 110-122; Hudspeth, William J., "The Neuro-behavioral Implausability of the Delacato Theory," Reading and Emerging Social Values, (28th Yearbook of the Claremont Reading Conference, Claremont, California, 1964), p. 126.

⁶²Julia M. Penn, "Reading Disability: A Neurological Deficit?" (Exceptional Children, December, 1968), p. 243-249.

CHAPTER III

PERSONS INVOLVED AND PROCEDURES EMPLOYED

The study was concerned with three of the Doman-Delacato techniques, cross-pattern creeping, cross-pattern walking, and the correct sleep position and their cumulative effect upon the reading progress of four boys who were enrolled in the reading program at Oakdale School in Salina, Kansas. Pages 28 and 29 picture the techniques mentioned.

Each of the four boys evidenced neurological disorganization in some form; each could be classified as a disabled reader.

The boy's ages and grade placements at the beginning of the study were as follows:

B. Y. -- 11 yrs. -- 5 mo. -- grade 6;

R. Y. -- 12 yrs. -- 8 mo. -- grade 5;

G. Y. -- 10 yrs. -- 2 mo. -- grade 4;

M. Y. -- 8 yrs. -- 3 mo. -- grade 2.

B. Y. was given a social promotion in the early part of grade four to grade five. A social promotion is being considered this year for R. Y. since he is quite large and more mature in many ways than the other children in his group. All of the boys had been retained one year in school.

Permission to carry on the study was granted by the Director of Elementary Education with the stipulation that

written permission from the parents of each participant be on file in the school office. This stipulation was fulfilled.

Conferences were held with the parents of each boy and the actual procedures of the study were explained in detail.

All the boys had been tested by the school counselor upon recommendation for placement in the reading program. This testing included the Bender Motor Gestalt Test and the Wechsler Intelligence Scale for Children.

Each boy had taken an S.R.A. Reading Achievement Test in the fall. In addition to these tests the Harris Test of Lateral Dominance⁶³ and the Dolch Word Test were administered at the beginning of the study. The Gray Oral Reading Tests⁶⁴ were given by the reading consultant near the beginning and at the end of the study proper.

The reading progress of disabled readers is difficult to evaluate completely through either oral or written reading tests as such. Therefore, teacher evaluations were used to round out the study.

The study proper was initiated on December 9, 1968 and terminated on March 28, 1969 with a loss of seven sessions during the Christmas vacation. This constituted a total of

⁶³Harris, op. cit., These tests can be administered by the classroom teacher and provide measures of eye and hand performance.

⁶⁴W. W. Gray, The Gray Oral Reading Paragraphs, (Indianapolis: The Bobbs-Merrill Co., Inc., 1963). The only oral reading test with five forms.

seventy-three half-hour sessions as the program was operated Monday through Friday with no reinforcement asked of the home except to remind the child to assume the correct sleep position upon retiring.

The boys arrived at the reading room thirty minutes before school began. Early arrivals worked individually. At eight o'clock group work began.

The period from December 9, to December 20, was spent practicing the sleep position for ten minutes and cross-pattern creeping for twenty minutes. During the sleep position period, the teacher read aloud to the boys, completing the books Robinson Crusoe and Robin Hood by the end of the study. Figures on pages 28 and 29 illustrate the techniques practiced.

The two weeks following the return to school after Christmas vacation were spent in the same pattern as the first two weeks--ten minutes spent in the proper sleep position and twenty minutes of cross-pattern creeping with this difference: Where in the first two weeks the boys were concerned only with synchronizing the cross-pattern arm and leg movement they were now asked to turn the head towards the forward hand with each advancement. This was one of the hardest things for them to accomplish.

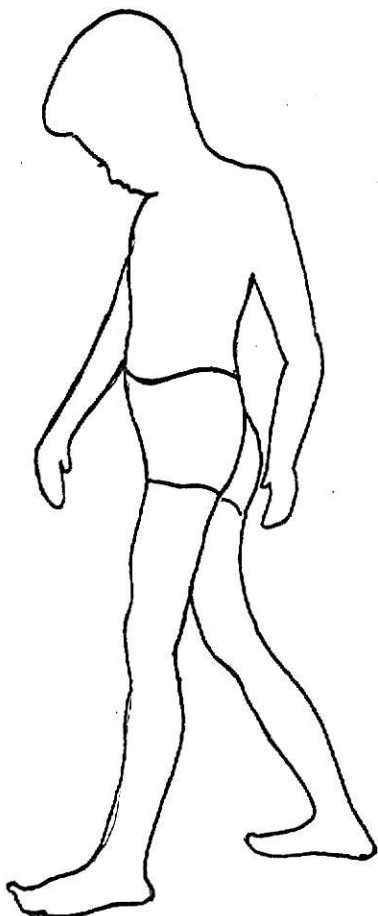
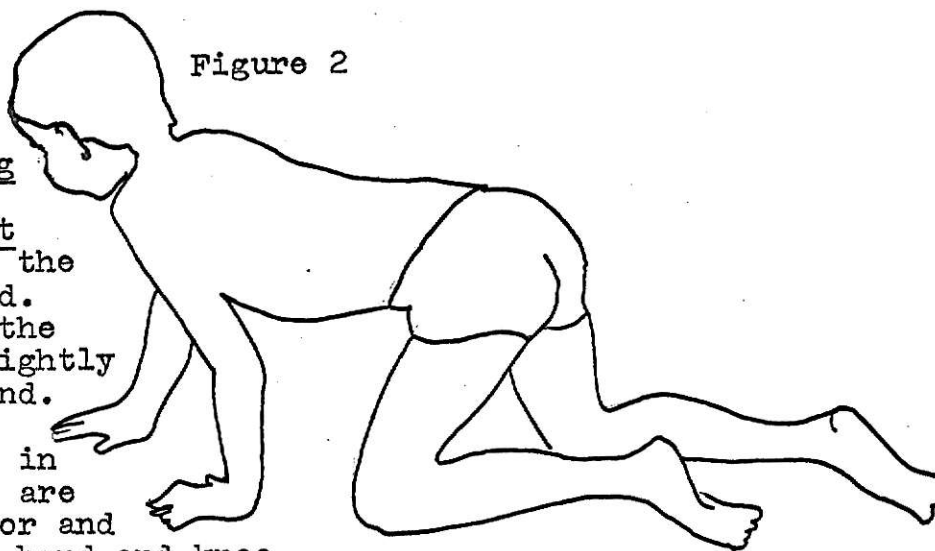
On January 20, the boys began a five minute cross-pattern walking in place session. This decreased the cross-pattern creeping time to fifteen minutes.

Figure 2

Cross-pattern creeping

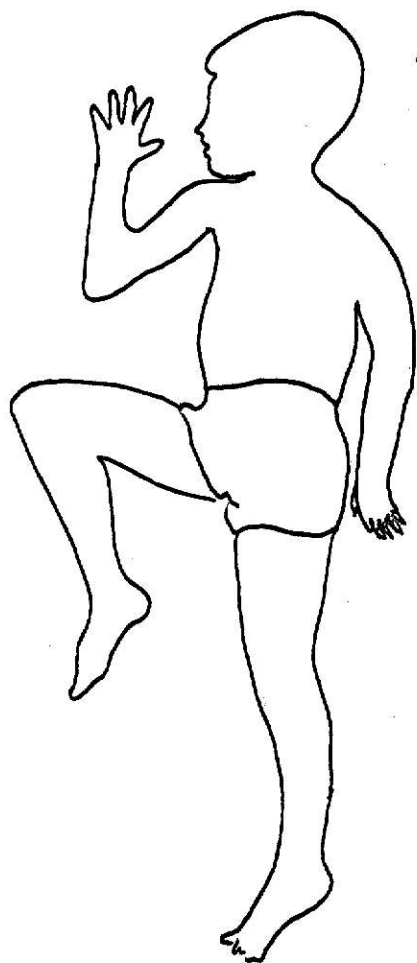
Note that as the right hand is moved forward the left leg moves forward. As this takes place, the head and neck turn slightly toward the forward hand.

Points to be observed in this activity: Hands are to be flat on the floor and pointed forward. The hand and knee should move forward simultaneously.

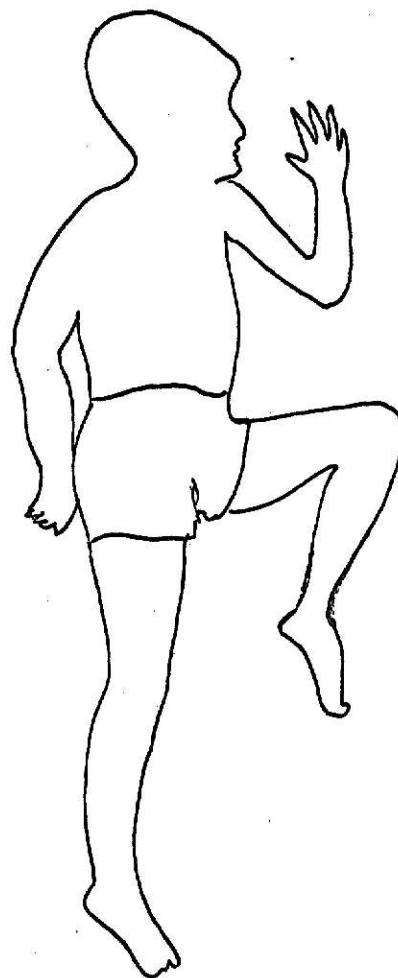
Cross-pattern walking

The right hand and left leg move forward with the head and neck turned slightly toward the forward hand.

Figure 3



The ideal sleep position of the completely right-sided child.



The ideal sleep position of the completely left-sided child.

N.B. The child is not expected to remain in this position during sleep, since it is natural for him to shift from one position to another. A child not yet six years of age may use either sleep position since a preference for a particular side has not been established.

After two weeks, the in-place walking was replaced by actual cross-pattern walking. All boys except one mastered this part of the program quickly. On February 3 the head movement was added to the cross walking routine which was still being practiced for only five minutes. This movement paralleled that of the head movement in the cross-creeping routine. When properly executed the head turned and the opposite arm reached or swung toward the forward foot. This was difficult for all of the boys. Walking would become arrhythmical and often the whole pattern of walking broke down. When this occurred the individual was asked to stop and stand still, then walk in place until he felt himself able to walk rhythmically and in pattern.

On February 17 an adjustment was made in the time allotted each activity. The sleep position was assumed for only five minutes; the cross-pattern creeping continued for fifteen minutes and the walking for ten. This time schedule was followed until the end of the program.

Besides the Delacato procedures, the use of balance beam was begun in the fourth week of the program to provide the early arrivals with a worthwhile activity while waiting for the others. This was of very short duration each morning, even non-existent at times. It was unstructured and voluntary and was replaced with ball bouncing with dominant hand, ball guidance with the dominant foot or hopping on the dominant foot.

Each boy came to the reading room at another period in the day for reading instruction. The amount of time for this

reading instruction varied. Boy B. Y. came from another school, so he stayed the fifteen minutes after the Delacato activities for his reading instruction then returned to his own school for the day. On March 3, he was accepted at the Diagnostic and Remedial Center in Salina. After this, instead of returning to his own school after his reading period, he went to the Diagnostic Center for the remainder of the morning. The afternoons were spent in his home school.

Boy R. Y. enjoyed working with boy B. Y. so he began to stay with him for his fifteen minutes of instruction. The teacher allowed this because it seemed to foster a little more enthusiasm in B. Y. R. Y. came back for 30 minutes of instruction with his regular group of five at another period of the day, giving him 45 minutes of teacher-directed instruction.

In addition to this he was able to come for 15 or 20 minutes twice a week to listen to teacher constructed tapes. The classroom teacher was very cooperative in this respect. R. Y. had a speech impairment and it was felt the tapes might help him in this area.

The other two boys, G. Y. and M. Y., came for 30 minutes of instruction each week day. G. Y. in a group of seven and M. Y. in a group of four. G. Y. received speech therapy for six weeks during this period.

Table II on page 32 presents a cumulative progress report for each boy involved in the study.

CHAPTER IV

RESULTS OF THE STUDY

Since it was felt that if any changes were to appear on a post-administration of the WISC, they would appear in the performance area, those were the only tests given at the end of the study. Table III, pages 36 and 37, presents the data derived from this testing as well as the Bender Motor Gestalt.

Table IV, page 38 is a presentation of the attendance during the study. It was included because this attendance was achieved despite the bad weather encountered in December, January, February, and March.

Tables V and VI, pages 39 and 40, show the reading progress of each boy as measured by the S.R.A. Achievement Tests and the Gray Oral Reading Paragraphs. Table VII, page 41, shows the comparative gains in the Dolch Word Test and Table VIII, page 42, is a resume of the Harris Test of Lateral Dominance.

Evaluation of any program followed in teaching children is desirable. It is necessary in a remedial situation if the desired results are to be achieved.

In his article, "Evaluating Progress in Remedial Reading Programs," Bliesmer suggests these three ways of evaluating the effectiveness of a remedial reading program: (1) determining gains by the typical method of finding differences between "before" and "after" reading tests scores; (2) comparing remedial gains with average yearly gains made before the program; (3)

finding differences in reading potential and reading achievement levels (potential achievement gap) at the beginning and end of a remedial program.⁶⁵

Table VI, page 40, giving the scores on the Gray Oral Paragraphs, gives the results of the study using the first of Bliesmer's criteria. Tables IX and X, page 43, show the results of the study using Criteria two and three respectively.

On May 20, approximately two months after the termination of the study, a third form of the Gray Oral Paragraphs was given. This testing showed that three of the four boys were maintaining the gains made during the study with no loss. B. Y. had regressed two months but was maintaining a one month gain.

Informal teacher evaluations for all but one of the boys showed positive reaction. B. Y.'s teacher felt that he was showing more interest in reading and more enjoyment. R. Y.'s teacher saw many positive gains. His peers viewed him in a better light not only because he was doing better academically, but because he was taking part in sports and his general appearance was brighter and although he often needed to be reminded to enunciate clearly there was a distinct improvement in his speech. G. Y.'s teacher could see little improvement in the classroom. However the speech teacher felt that he could now achieve all sounds and that his poor speech

⁶⁵Leo M. Schell and Paul C. Burns, Remedial Reading; An Anthology of Sources, (Boston: Allyn and Bacon, Inc., 1968), pp. 397-403.

was more habit than disability. M. Y.'s teacher was enthusiastic about the change remarking that she had the feeling that he knew what he was doing now. M. Y., himself, commented that perhaps his whole class could come to summer school.

TABLE III

WECHSLER INTELLIGENCE SCALE AND
BENDER-MOTOR GESTALT RESULTS

| Performance Tests | Boy B. Y. | | Boy R. Y. | | Change in Scaled Scores | Bender Motor Gestalt |
|---------------------|---------------------|--------------------|--------------------|--------------------|----------------------------|-------------------------|
| | 11/20/67 CA 10-5 | 4/2/69 CA 11-10 | 5/15/68 CA 12-1 | 4/2/69 CA 12-11 | | |
| Picture Completion | 18 | 20 | | | +2 | Little change. |
| Picture Arrangement | 9 | 10 | | | +1 | Evidence of |
| Block Design | 15 | 14 | | | +1 | slightly more |
| Object Assembly | 13 | 17 | | | +4 | emotional involve- |
| Coding | 3 | 4 | | | +1 | ment. |
| Performance Scale | 111 | 121 | | | +10 | |
| | | | | | | |
| Picture Completion | 9 | 8 | | | +1 | Reproduction of |
| Picture Arrangement | 12 | 11 | | | +1 | Bender Motor Ges- |
| Block Design | 13 | 13 | | | -- | talt figures |
| Object Assembly | 13 | 12 | | | +1 | showed some im- |
| Coding | 10 | 14 | | | +4 | provement of visu- |
| Performance Scale | 110 | 111 | | | +1 | al perception a- |
| | | | | | | long with motor |
| | | | | | | performance but |
| | | | | | | little improvement |
| | | | | | | in emotional in- |
| | | | | | | volvement with |
| | | | | | | feelings of inse- |
| | | | | | | curity. |

TABLE III (CON'D)

WECHSLER INTELLIGENCE SCALE AND
BENDER-MOTOR GESTALT RESULTS

| Performance Tests | Boy G. Y. | | Boy M. Y. | | Bender Motor Gestalt |
|---------------------|------------------|-------------------|-------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| | 4/6/67 CA 8-7 | 4/3/69 CA 10-6 | 1/29/68 CA 7-4 | 4/2/69 CA 8-6 | |
| | Scaled Scores | Scaled Scores | | | Change in Scaled Scores |
| Picture Completion | 8 | 10 | | | +2 |
| Picture Arrangement | 8 | 12 | | | +4 |
| Block Design | 10 | 12 | | | +2 |
| Object Assembly | 7 | 13 | | | +6 |
| Coding | 9 | 11 | | | +2 |
| Performance Scale | 89 | 111 | | | +22 |
| | | | | | Considerable improvement in the Bender Motor Gestalt reproduc- tions and less evidence of emo- tional involvement. |
| | | | | | |
| Picture Completion | 10 | 13 | | | +3 |
| Picture Arrangement | 16 | 15 | | | +1 |
| Block Design | 13 | 11 | | | +2 |
| Object Assembly | 10 | 15 | | | +5 |
| Coding | 4 | 9 | | | +5 |
| Performance Scale | 104 | 118 | | | +14 |
| | | | | | Little change in Bender Motor Gestalt repro- ductions. |

TABLE IV
ATTENDANCE RECORD OF STUDY PARTICIPANTS

| Boy | Possible Attendances | Days Absent | Total Attendance |
|-------|-------------------------|----------------|---------------------|
| B. Y. | 73 | 2 | 71 |
| R. Y. | 73 | 2 | 71 |
| G. Y. | 73 | 2 | 71 |
| M. Y. | 73 | 2 | 71 |
| TOTAL | 292 | 8 | 284 |

TABLE V
S.R.A. ACHIEVEMENT TEST SCORES IN READING

| Name | Test Form | Date | G.E. | Test Form | Date | G.E. | Gain |
|-------|-----------------|------|------|-----------------|------|------|------|
| B. Y. | Form C (4-6) | 9/68 | * | Form C (2-4) | 5/69 | 1- | + -1 |
| R. Y. | Form C (4-6) | 9/68 | 3.7 | Form D (4-6) | 5/69 | 4.6 | +0.8 |
| G. Y. | Form C (2-4) | 9/68 | 3.1 | Form C (2-4) | 5/69 | 6.1 | +3.0 |
| M. Y. | Form C (2-4) | 9/68 | 1- | Form C (2-4) | 5/69 | 2.2 | +1.2 |

*It should be noted here that B. Y. was given Form C (4-6) of the S.R.A. Reading Achievement Test in his room in September of 1968, but failed to score. Therefore, it was decided to use Form C (2-4) of the S.R.A. Reading Achievement Test for the test given in May.

TABLE VI
GRAY ORAL READING PARAGRAPHS

| Boy | January 7, 1969 Pre | March 27, 1969 Post | Gain |
|-------------|------------------------|------------------------|------|
| B. Y. (6th) | 1.3 | 1.6 | + .3 |
| R. Y. (5th) | 1.7 | 2.0 | + .3 |
| G. Y. (4th) | 1.4 | 2.0 | + .6 |
| M. Y. (2ed) | 1.4 | 1.9 | + .5 |

TABLE VII
DOLCH BASIC SIGHT WORD TEST

| Name | Pre-test R. S. | 12/9/68 G. E. | Post-test R. S. | 3/2/69 G. E. | Gain |
|-------|-------------------|------------------|--------------------|-----------------|------|
| B. Y. | 84 | 1.5 | 104 | 1.6 | +.1 |
| R. Y. | 147 | 1.8 | 191 | 2.5 | +.6 |
| G. Y. | 90 | 1.5 | 178 | 2.2 | +.6 |
| M. Y. | 80 | 1.4 | 126 | 1.7 | +.3 |

TABLE VIII
HARRIS TEST OF LATERAL DOMINANCE

| Name | Handed | Footed | Eyed | Simultaneous Writing* | Other Pertinent Facts |
|-----------|--------|--------|------|-----------------------|---------------------------------------|
| <hr/> | | | | | |
| B. Y. | | | | | |
| Pre-test | R | R | R | M | 2 reversals each hand |
| Post-test | R | R | R | R | Quality of writing improved. |
| <hr/> | | | | | |
| R. Y. | | | | | |
| Pre-test | M | M | R | M | 1 reversal left 2 reversals right |
| Post-test | M | M | M | L | 0 reversals left 5 reversals right |
| <hr/> | | | | | |
| G. Y. | | | | | |
| Pre-test | M | L | M | L | 0 reversals left 1 reversal right |
| Post-test | L | L | R | L | 0 reversals |
| <hr/> | | | | | |
| M. Y. | | | | | |
| Pre-test | R* | R | R | M | 3 reversals left 2 reversals right |
| Post-test | R | R | R | R | 2 reversals left 0 reversals right |

*M. Y. wrote and combed his hair with his left hand; everything else was done with his right. On post test, writing was only thing done with the left hand.

TABLE IX
REMEDIAL GAINS / MONTH COMPARED TO PRIOR GAINS / MONTH

| Name | Gains / mo. prior to program | Gains / mo. during program |
|--------|---------------------------------|-------------------------------|
| *B. Y. | .024 mo. | 1.00 mo. |
| R. Y. | .032 mo. | 1.00 mo. |
| G. Y. | .032 mo. | 2.00 mo. |
| M. Y. | .058 mo. | 1.66 mo. |

*It should be pointed out that each boy had been retained one year. B. Y. had been given a social promotion in grade four.

TABLE X
POTENTIAL ACHIEVEMENT GAP (P. A. G.)

| Name | IQ | Rdg. Pot. | Rdg. Ach. | Prior to Study P. A. G. | At End of Study Rdg. Ach. | Study P.A.G. | Reduction in P. A. G. |
|-------|-----|--------------|--------------|-------------------------------|------------------------------|-----------------|-----------------------------|
| B. Y. | 102 | 6.6 | 1.3 | 5.3 | 1.6 | 5.0 | .3 |
| R. Y. | 96 | 6.2 | 1.7 | 4.4 | 2.0 | 4.2 | .2 |
| G. Y. | 93 | 5.1 | 1.4 | 3.6 | 2.0 | 3.1 | .5 |
| M. Y. | 110 | 3.7 | 1.4 | 2.3 | 1.9 | 1.7 | .5 |

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Interpretations of Test Results

Chapter IV presented, in tabular form, the results of each test used to evaluate the study. Chapter V interprets the results of each test and on the basis of the total interpretations presents some conclusions, recommendations, and predictions.

The table on attendance, page 38, is indicative of high interest in the program by the boys and their families. Each boy had a total of two absences out of a possible seventy-two. The absences for B. Y. occurred when he contracted mumps. Fortunately, this was just prior to the Christmas holiday. The absences for R. Y. were incurred during unusually heavy snows. He was in the habit of riding his bicycle across town, since he was attending Oakdale by special permission, because of the reading program. On two days the snow was too heavy to ride through and he was forced to wait for a taxi. The other absences were due to colds.

At first glance the Harris Test for Lateral Dominance, page 42, appeared to have few changes. A closer study of the table, however, showed that the changes which did occur were in the area which Harris says bears the most significance to a specialized kind of maturational slowness, mixed hand dominance; and in the area which is the best indicator of directional con-

fusion, simultaneous writing.⁶⁶ B. Y., the only one of the four to write with his right hand, showed mixed dominance or directional confusion according to the simultaneous handwriting on the pre-test, but a right dominance on the post-test. At the end of the study, this placed him in the completely right sided category of individuals. This is the ultimate goal of neurological organization.

On the pre-test R. Y. proved to be right eyed, but exhibited mixed dominance in all other areas, even simultaneous handwriting, despite the fact that he wrote with his left hand. On the post-test the eye dominance was mixed, but simultaneous writing showed a left sidedness. This was construed as a positive result. True, he changed from right eye dominance to mixed, but Harris says eye dominance and foot dominance have little significance in regard to reading disability.⁶⁷ This was possibly the beginning of the slow swing to left sided dominance for R. Y.

G. Y. evidenced mixed handedness, with left dominance on simultaneous handwriting on the pre-test. On the post-test he was left handed, left footed, with left dominance in simultaneous writing. This indicated a gain in maturation and an advance in sidedness for G. Y.

⁶⁶ Albert J. Harris, Harris Tests of Lateral Dominance, Manual of Directions, (New York, The Psychological Corporation, 1958), pp. 21-22.

⁶⁷ Ibid., p. 20.

On the pre-test M. Y. wrote with his left hand and combed his hair with his left hand. Yet, on the scoring scale he was placed in the right sided category in everything except simultaneous writing, which showed a mixed dominance.⁶⁸ On the post-test he fell into the classification of the completely right sided individual, even though he continued to write with his left hand.

The results of M. Y.'s tests give rise to the question, "Might this be a child who could profit from a change in handedness for writing?"

The author felt that any change in sidedness was the direct result of better neurological organization brought about by the cross-pattern creeping, cross-pattern walking and practice of the correct sleep position. This was borne out by the fact that there was some incidental work on sidedness at the beginning of each session, during which time the boys were encouraged to use the hand and foot which corresponded to the hand used for writing. In the case of M. Y., this was the left hand and foot, yet he showed a definite swing to right sidedness.

The Gray Oral Reading Paragraphs and The Dolch Basic Sight Word Test, pages 40 and 41, showed a high degree of parallelism. These tests, administered by different examiners, showed gains for all boys. The greater gains on The Gray Para-

⁶⁸Ibid., p. 11 (Test 2).

graphs were the probable result of the contextual clues available on this type of test.

The S.R.A. Achievement post scores, page 39, showed a gain for each boy. The gains however were erratic and did not show the same degree of parallelism with either The Gray Oral Paragraphs or The Dolch Basic Sight Word Test that those two showed to each other. The large gains for G. Y. and M. Y. of 3.0 and 1.2 respectively should be noted.

The pre-scores of the S.R.A. were obtained from tests administered in a large group. The post-scores were obtained from tests administered in small groups of not more than seven. While no more help was given on the post-test than the manual provided for, it is possible that remedial pupils may listen better in small groups due to fewer distractions, more strategic seating positions, etc.. The impersonal atmosphere and the remoteness of the administrator in a large group situation versus the feeling of closeness and unity of the small group may be a contributing factor in the large gains shown on this test by the two boys G. Y. and M. Y.

Whatever the contributing factors to the test results may have been, the S.R.A. exemplifies most survey tests in that they help to locate individuals with reading difficulties but tend to overplace them for instructional purposes.

A comparison of the gains for each boy as shown on Table VI, The Gray Oral Paragraphs, page 40; Table IX, Remedial Gain per Month, page 43; and Table X, Reduction in Potential Achieve-

ment Gap, page 43; showed proportionate gains on each of these methods for evaluating remedial reading programs.

The Table on pages 36 and 37 showed performance gains for all boys on the WISC. However, the minimal overall performance gain for R. Y. as compared to that for the other boys necessitated a close look at the sub tests, since R. Y.'s reading score gains were comparable to the others.

On the sub tests, the test on which R. Y. made his greatest gain was coding. The only boy to make a greater gain on coding was M. Y. This observation appeared to reinforce a statement by the counsellor in her interpretation of the W.I.S.C. that the score on coding was indicative that R. Y. had reading ability.

On the Bender-Motor Gestalt we see that for two of the boys there was little change, for one some improvement of visual perception and motor performance and for the other considerable improvement in Bender-Motor Gestalt reproductions. Some showed less emotional involvement some showed more emotional involvement. The variations in the results of these tests made it hard to relate the Bender-Motor Gestalt performance to reading and tended to confirm the results of a study by Cellura and Butterfield that indicated that Bender-Motor Gestalt performance had little relation to reading achievement.⁶⁹

⁶⁹A. R. Cellura and E. C. Butterfield, "Intelligence, The Bender-Gestalt Test and Reading Achievement", American Journal of Mental Deficiency, 1966, pp. 71, 60-63.

Neurologically impaired children often exhibit speech problems.⁷⁰ The improvement noted by teachers of R. Y. and G.Y. appears to be a positive result of the program since neither boy had shown much improvement prior to the program.

Conclusions

The study was small and no conclusions for the disabled reader population as a whole could be drawn. However, from the foregoing interrelations it was concluded that participation in the program using the three Doman-Delacato techniques in conjunction with a traditional approach to remedial instruction, for the four boys involved, may have contributed to:

- 1) desirable changes in dominance;
- 2) desirable changes in self concept;
- 3) measurable improvement in reading performance; and,
- 4) improvement in the ability to produce speech sounds in the case of the two boys having trouble in this area.

Recommendations

Reading, writing and arithmetic, the only basic neurological functions taught in school are at the end of the continuum which begins with reaching, grasping, rolling over, sitting, standing, walking, running, talking, and so on. It has long been realized that there are children with perfectly

⁷⁰R. M. N. Crosby, M.D., and Robert A. Liston, "Dyslexia: What You Can-and Can't-Do About It," (Grade Teacher, February, 1969), p. 77.

formed vocal apparatus who cannot talk and children with normal bones and musculature who cannot walk because of a neurological impairment.⁷¹

In the light of this knowledge and the results of this study it is recommended:

1) the personnel of the Salina reading program follow up the four boys involved in this study to see if they continue to progress in reading and, in the case of two of the boys who had difficulties, in speech.

2) that teachers of the Salina system be continually aware of the symptoms indicative of neurological impairment and that longitudinal studies of small groups continue to be made.

3) that classes of children working on the Delacato techniques be limited to not more than four to a teacher since it is felt that value gained through the exercises is in direct proportion to the exactness with which the exercises are executed.

Parents of children with reading difficulties are eager for assurance that reading problems may be of physiological or neurological etiology. In all fairness to this group of parents and children, educators must investigate the incidence of neurological disabilities within the normal classroom and instigate means of evaluating and relieving them.

⁷¹Ibid.

The writer of this paper predicts that the Doman-Delacato approach to the treatment of reading difficulties or some similar method will be an integral part of school programs in the near future instead of the controversial issue that it is today.

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APPENDIX

CASE STUDY (1)

NAME.....B. Y.
AGE.....11 yrs. 10 mo.
BIRTHDATE...4/28/56
ADDRESS....Salina, Kansas

DATE--April 20, 1969
PARENTS OCCUPATION
Father-Drives City Bus
Mother-Cosmetic Firm Rep.

B. Y. was a nice appearing boy, quite talkative and quite easily distracted when engaged in anything related to reading. He was right handed with no evidence of mixed dominance. He was quite interested in science and had made a battery powered response board for one of the teachers in his school. B. Y. began coming to the reading room with a group of sixth grade boys and girls who worked far above his level. In any group activity he was ill at ease and one could see him become tense and flushed when asked to respond in any way. There was one activity in which he could take part with some confidence and that was the games which were played on certain days of the week. These games required the giving of a letter or blend or some other sound which surprisingly he was able to do to a certain extent.

At the beginning of the study the teacher was able to keep him alone for fifteen minutes. Later R. Y., with whom he became acquainted during the study activities, began staying with him and he seemed to like that.

Family

Parents. B. Y.'s parents were quite appreciative and felt that the teachers had all tried to help their son through the years.

The father indicated that he had some reading problems also.

Siblings

B. Y. had one brother in high school. There appeared to be considerable rivalry between the brothers. The older brother had never had any problems in school academically.

School Records and Testing

Resume of Teacher Comments from B. Y.'s Cumulative Record.

Most teachers indicated a strong weakness in all basic skills. While the kindergarten teacher indicated that he was rarely conversant, his first grade teacher thought he talked too much. Most felt he had a good disposition and mentioned his skill in using his hands and his interest in any science related activity. All agreed that he had greater potential than his work showed.

The WISC and Bender-Motor Gestalt were administered to B. Y. by the school counselor. The scores and her interpretation are contained in the following summary.

| | <u>WISC</u> | |
|-------------------|--------------|------|
| 11/20/67 | Scaled Score | I.Q. |
| Verbal Scale | 43 | 91 |
| Performance Scale | 68 | 111 |
| Full Scale | 111 | 102 |

B. Y. evidenced more performance than verbal ability. The vocabulary score indicated normal ability. Comprehension,

a measure of social judgments, was his highest score. The arithmetic score was his lowest. He could not handle similarities well. Block designs, however, were performed well above chronological age level. On coding there appeared to be a disruption of symbol concept. Highest score was in picture completion.

A new approach to reading was recommended.

The Bender-Motor Gestalt

The Bender-Motor Gestalt reproductions were small and restricted to a small area. There was little evidence of emotional involvement.

The mother reported that B. Y. had been a premature child and had been given oxygen at birth and later in infancy when he contracted pneumonia at two different times.

He evidenced maturational lag in all developmental areas, being slow to sit up, talk, walk or play with his peers.

The performance part of the WISC as well as the Bender Gestalt was given and interpreted by the same counselor in April of 1969 at the completion of the Doman-Delacato study. See Table II for the results. (Page 32)

S.R.A. ACHIEVEMENT TEST (READING)--9-67

| Form B (2 - 4) | Grade Equiv. | Percentile |
|----------------|--------------|------------|
| Comprehension | 3.1 | 20 |
| Vocabulary | 3.1 | 12 |
| Total | 3.1 | 10 |

9-24-68

Subject was administered the S.R.A. Achievement Test (4-6), form letter not available. It is not known whether he just did not do enough to score (since the test was machine scored) or if he did not attempt the test. However, the only scores on the pre-score slip on his record were in Language Arts.

CAPITALIZATION AND PUNCTUATION

| | | | |
|--------|-----|------------|----|
| G.E.Q. | 4.1 | Percentile | 01 |
|--------|-----|------------|----|

For this reason the S.R.A. Achievement Test level 2-4 Form C was used for testing at the end of the study. See Table IV, page 38.

CASE STUDY (II)

NAME.....R. Y.
AGE.....12 yrs. 11 mo.
BIRTHDATE...4/25/56
ADDRESS.....Salina, Kansas

DATE--April 20, 1969
PARENTS OCCUPATION
Father-Works at Beech
Mother-Works at bank

R. Y. was a tall, well-developed boy almost thirteen years old. He appeared to have an allergy which caused him to be a mouth breather. His conversations were almost unintelligible. However, he was very willing to try again and would try to speak more distinctly when encouraged to do so. He was a Boy Scout and seemed to function very satisfactorily as a troop member.

Family

Parents. Of the two parents, the mother seemed to be the most educated. While it was determined that she worked at the bank at night the nature of her work was not discussed. She was eager to have R. Y. participate in the study but did say she could not promise to follow through on anything at home.

The father, who worked at Beech Aircraft Corp. in Salina, was at home with the children in the evening. He felt himself to be a very poor reader.

Siblings

R. Y. is the middle child with three brothers and one sister. A brother just younger is in the same grade. The

family moved into another district in the city. One brother was transferred to that school and R. Y. remained in Oakdale in order to take advantage of the reading program. It was felt that this would make things easier for R. Y.

History of Physical Development

The mother reported that the labor period before R. Y.'s birth was very short and that drugs were used so she does not remember anything about the immediacy of the birth cry. In infancy his sleeping habits were poor. As a baby he was not very active. When he began to crawl, he moved with the left leg under him. When he began creeping, he slid on the buttocks. Onset of walking was at approximately one year of age. He was encouraged to walk. He was slow to begin talking, and talked very little at first and could not be understood. The parents were cognizant of the fact that the boy did not hear well.

R. Y. was left handed, although he used his right hand for some things. There was never any attempt to influence handedness. His older brother was left handed, but threw a ball and batted with right hand. He had an uncle who was left handed.

Disease and Accident Report

Chicken Pox--no date

Rode bike down hill, hit rocks and knocked a tooth out
in 1963--app. 7 yrs.

Stepped on nail--kindergarten

Had ears checked by specialist--allergy

School Records and Testing

R. Y. had been retained one year in school. In March of 1963 he was referred to the Mental Health Center in Salina for an evaluation by the school which he was then attending. The family did not move to Salina until 1967. At the Mental Health Center, he was given the Binet Intelligence Test and an I.Q. of 75 was obtained. The mother was informed that her child was retarded. She and the family were unable to accept this. In 1964 she again took the boy to the Mental Health Center. No testing was done at that time but the previous findings were reviewed.

Before placement in the reading room at Oakdale, R. Y. was given the WISC and Bender-Motor Gestalt by the school counselor. Her scores and interpretations are given below.

| | <u>WISC</u> | |
|-------------------|--------------|------|
| 5/15/68 | Scaled Score | I.Q. |
| Verbal Score | 46 | 85 |
| Performance Score | 57 | 110 |
| Full Scale | 103 | 96 |

On this test R. Y. evidenced more performance than verbal ability. He was weak in similarities which could point to some organic damage. However, the high scores on block

design would refute this. Coding indicated that he should have reading capabilities. Good picture arrangement pointed up a social adjustment ability.

The performance tests of the WISC were readministered at the end of the foregoing study. See Table II, page 32, for results.

The Bender-Motor Gestalt reproductions were restricted to a small area of the paper evidencing a feeling of insecurity and withdrawal.

R. Y.'s three wishes were to pay up the bills, get rid of all of the cars back of the house and get a larger house. He had several things he would like to be when he grew up. "Be a farmer and grow stuff, make airplanes like his dad, make pictures like an artist and write stories."

S.R.A. ACHIEVEMENT TEST (READING ONLY)--9-67

| Form C (2 - 4) | Grade Equiv. | Percentile |
|-------------------------|--------------|------------|
| Comprehension | 5.2 | 74 |
| Vocabulary | 3.2 | 24 |
| Total | 4.2 | 52 |
| Form C (4 - 6)--9-25-68 | | |
| Comprehension | 4.3 | 32 |
| Vocabulary | 3.1 | 05 |
| Total | 3.7 | 18 |

The reading part of Form D (4-6) was given at the close of the study. See Table IV, page 38.

R. Y.'s present teacher says that he loves Math and does above average work despite his reading handicap.

CASE STUDY (III)

NAME.....G. Y.
AGE.....10 yrs. 7 mo.
BIRTHDATE..9/21/58
ADDRESS....Salina, Kansas

DATE--April 20, 1969
PARENTS OCCUPATION
Mother-Nurse

G. Y. was a good sized fourth grade boy. Fair haired, blue eyed, and freckled, he was a slow moving and apparently slow thinking child although very cooperative and anxious to please. So much so that his room teacher reported he might break into tears at a remark not meant to be a reprimand but which he interpreted as such. He was a mouth breather, exhibiting little lip and jaw movement. He seemed to find the beginning of the speech act very difficult to accomplish. This was apparent in his reading also. It was hard to get started. He was left handed and reflected a clumsiness in all of his movements. The mother reported that several relatives were left handed.

Family

Parents. Father and mother were separated. This separation occurred when G. Y. was in the first grade. The father was working out of town and the family rarely saw him. Mother worked as a nurse in the local hospital. All of the child's material needs seemed to be taken care of. He was adequately clothed, fed, and kept clean.

Siblings

G. Y. was the only boy in a family of three. He had an older sister in grade six and a younger sister in nursery school.

The older sister had a speech problem also. Although her articulation was considerably better, she had the hesitancy and faltering qualities exhibited by G. Y. The tonal quality of her voice was very poor. This sister was enrolled in the reading program at the beginning of the year but while she made fair progress she resented having to go.

History of Physical Development

The mother reported that G. Y.'s infancy was average with no unusual happenings. However, she also reported that he had Roseola with a high temperature as a baby.

He spent a relatively short time creeping (approx. two months), began walking at about thirteen months, sometimes walking on tiptoe. He did not talk much until he was past three years of age.

His school attendance was relatively good through the year.

Disease and Accident Record

Roseola (as a baby)--high temperature

Measles

Chicken Pox--high temperature

Pneumonia (twice)--high temperature

Salmonella--high temperature

School Records and Testing

WISC AND BENDER GESTALT

Administered and Interpreted by School Counselor

| 4/6/67 | Scaled Score | I.Q. |
|-------------------|--------------|------|
| Verbal Score | 49 | 99 |
| Performance Score | 42 | 89 |
| Full Scale | 91 | 93 |

Evidenced more verbal than performance ability.

On test analysis subject was found to be low in similarities and digit span. This is primarily a test of concept formation at a thinking level, involving the holding of two ideas in mind and comparing them sufficiently to produce a third idea related in some manner. Could indicate some sort of mental deficiency.

Bender-Motor Gestalt reproductions indicated the possibility of some type of brain disorder. Visual motor coordination was not good.

The performance tests of the WISC were re-administered in April of 1969 at the end of the study by the same counselor. See Table II, page 32.

G. Y.'s three wishes were to be a clown, make funny jokes, and hit his sister in the seat and send her flying because she always did that to him.

S.R.A. ACHIEVEMENT TESTS (READING)--9-67

| Form D (2 - 4) | Grade Equiv. | Percentile |
|-------------------------|--------------|------------|
| Comprehension | 2.4 | 24 |
| Vocabulary | 1.6 | 06 |
| Total | 2.2 | 16 |
| Form C (2 - 4)--9-25-68 | | |
| Comprehension | 3.1 | 10 |
| Vocabulary | 3.1 | 12 |
| Total | 3.1 | 04 |

Form C (2-4) of this test was re-administered at the end of the study. See Table IV for overall comparison. (page 38)

CASE STUDY (IV)

| | |
|---------------------------|--------------------------------------|
| NAME.....M. Y. | DATE--April 20, 1969 |
| AGE.....8 yrs. 7 mo. | PARENTS OCCUPATION |
| BIRTHDATE | Father-R.R. |
| ADDRESS....Salina, Kansas | Mother-Housewife, does iron- ings |

M. Y. was a highly excitable eight year old with black hair and eyes and olive skin. He was quite talkative and was a surprisingly good conversationalist using a vocabulary far beyond his years. Although he was active on the playground he always appeared meticulously neat and tidy. He enjoyed music very much. M. Y. was left handed and held his pencil in a prehensile manner.

The following statements were taken from the school counselor's report:

"Subject is left handed and puts force on pencil when using it. He often looks tired. Goes to bed after the news. Likes best to sit around and rest when not in school. Likes school a little, but is happiest in summer when he does not have to go."

Family

Parents. M. Y.'s parents were Spanish-American. The father worked regularly for the Railroad (Pacific) and part time for the V.F.W. The mother did ironings and cared for a three year old granddaughter besides her own family. The mother had a history of miscarriages and early deliveries and was delivered of M. Y. and his sister, the child nearest to him, by Caesarean section.

Siblings

M. Y. was the youngest child in the family. He had four older living brothers, two of whom were married, one in the Air Force and one in Junior High. He had one older brother who died at birth. The only girl in the family was in Junior High.

History and Physical Development

While the mother could not be too exact about dates at which subject crept, walked and talked, she felt he was about average. She did say, however, that she kept him in a bed or walker most of the time allowing him to creep very little because she did not want him to get dirty. When he did creep, there was a caterpillar action apparent.

Disease and Accident Report

No childhood diseases were listed.

Hernia operation but no date.

Injury to cushion of one knee cap.

School Record

M. Y. repeated first grade. His teacher for his first year in first grade felt that he was too "keyed" up to approach the tasks required of him. The teacher the second year in the first grade felt that he day dreamed and still was unable to do acceptable first grade work.

School attendance was good.

Testing from School Records

Before coming to the reading room, M. Y. was given the Bender-Motor Gestalt, House-Tree-Person and the WISC. These tests were administered and the following interpretation was given by the school counselor.

"On the Bender-Motor Gestalt reproductions were good with little evidence of anxiety or emotional involvement. However, on the House-Tree-Person he displayed anxiousness with no family identification. The house was his aunt's, the weather cold and windy. He would choose the school auditorium as his room, because it was large (a shift in thought) and would choose the principal to live with him. This difficulty of staying with reality of place often accompanies an emotionally disturbed condition."

The drawing of a person was "somebody that's going up to heaven. She got hit by a car and needs God."

Wishes were not to have bad dreams and that his brother would be okay when he came home from the Air Force.

WISC

| 1/29/68 | Scaled Score | I.Q. |
|-------------------|--------------|------|
| Verbal Scale | 61 | 114 |
| Performance Scale | 53 | 104 |
| Full Scale | 114 | 110 |

Since the performance area of the WISC was the area in which it was hoped to see improvement, it was this portion of the test which was re-administered at the end of the study by the same counselor. See Table II, page 32.

S.R.A. ACHIEVEMENT TEST (READING ONLY)--10-68

| | | |
|--------------|---------------|------------|
| Form C (2-4) | Reading Comp. | Vocabulary |
| 10-68 | 1-/04% | 1-/03% |

See Table IV for past scores on this test. (page 38)

THE DOMAN-DELACATO NEUROLOGICAL APPROACH AND ITS APPLICABILITY
TO THE TREATMENT OF READING DIFFICULTIES APPEARING
IN REMEDIAL READING PROGRAMS

by

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requirements for the degree

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College of Education

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Manhattan, Kansas

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Bibliography

The Doman-Delacato Approach and Its Applicability to the Treatment of Reading Difficulties Appearing in the Remedial Reading Program of Oakdale Elementary School, Salina, Kansas.

Purpose

It was the purpose of this study to use three of the Doman-Delacato techniques: (1) cross-pattern creeping, cross-pattern walking and the correct sleep position in addition to the usual remedial procedures, in the treatment of the reading difficulties of four boys coming to the reading room at Oakdale Elementary School, (2) to evaluate the effectiveness of this approach through pre- and post-standardized testing as well as informal observations, and (3) to make a judgment as to the advisability of expanding this approach to include more of the disabled readers coming to the reading room.

Rationale

The Delacato rationale is based upon the construct that an individual will be unable to reach his full potential in any area of the academic or physical world in which he lives if his neurological organization is incomplete; that for children who have experienced no known trauma, neurological organization is the sum total of the experiences through which they have moved in the normal process of development.

Methods

The four boys arrived at the reading room one-half hour before school each weekday. As a group they practiced cross-pattern creeping, cross-pattern walking and the correct sleep position as advocated by Delacato. In addition each boy spent another period which varied in time from fifteen to thirty minutes in traditional remedial instruction.

Results and Conclusions

It was concluded that this program may have contributed to: (1) desirable changes in the neurological area of dominance in the participants, (2) desirable changes in self-concept, and (3) measurable gains in reading improvement for the boys.