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INCOMPLETE NEUROLOGICAL DEVELOPMENT AS A
ROOT OF READING PROBLEMS:
A CLASSROOM TEACHER'S
APPROACH

BY

HELEN B. PROKES

A problem submitted
in partial fulfillment of the requirements
for the degree, Master of Education
South Dakota State
University

1967

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CHAPTER I

INTRODUCTION

Incomplete neurological development as a root of reading problems is a concept that could revolutionize our system of education.¹ It could guide us to treating the "disease" rather than the symptoms. It could save us much "beating of the air" in our use of methods. It could modify our demands that learning take place in developmental infancy.

At least, that is the theory of Dr. Carl H. Delacato² and his associates in their Developmental Reading Program at Chestnut Hill Academy in Philadelphia, Pennsylvania. Their motivation stems from the conviction that "reading problems need not exist at all because they can be successfully prevented."³

The Delacato system is not a teaching method. It is an attempt to aid the individual to achieve organization of the central nervous system so that he will be able to function in such a way as to realize his potential.

¹Carl H. Delacato, Treatment and Prevention of Reading Problems. Springfield, Illinois: Charles C. Thomas, 1959, p. 109.

²Director, The Institute of Reading Disability; Associate Director, The Institute for the Achievement of Human Potential, Philadelphia, Pennsylvania.

³Delacato, loc. cit.

PURPOSE OF THIS STUDY

The purpose of this study of the Delacato theory was to consider its usability as a deterrent or remedial tool in meeting the needs of a group of school children who are learning to read.

IMPORTANCE OF THE PROBLEM

The importance of the problem becomes evident in a consideration of the fact that there are six million children⁴ in remedial reading classes in our schools. Preoccupation with methods does not seem to have yielded a satisfactory solution.⁵ An aspect of urgency is indicated by statistics on retention, illiteracy, and drop-out rates.⁶

PROCEDURE

The literature of the field was reviewed in an effort to determine the possibility of implementing the theory in the classroom. Parts of the material available were re-read to deepen understanding of the concepts involved.

⁴Carl H. Delacato, Workshop, Mnakato, Minnesota, 1966.

⁵Ibid.

⁶United States Government, The United States Book of Facts, Statistics, and Information for 1967. New York: Simon and Schuster, 1967, pp. 112, 115, 117.

CLARIFICATION OF TERMS

1. Binaural--using both ears in concert.
2. Binocular--using both eyes in concert.
3. Cortex--the outer layer of the gray matter of the brain.
4. Cortical Hemispheric Dominance--one side of the brain initiates action.
5. Crawling--on the stomach.
6. Creeping--on the hands and knees.
7. Cross-pattern creeping--right hand moves with left leg and vice-versa.
8. Cross-pattern walking--right hand and left leg move forward with the head and neck turned slightly toward the forward hand and vice-versa.
9. Developmental stutter--occurring before preference of side has developed--a stutter of indecision.
10. Laterality--sidedness.
11. Medulla--lower section of the brain stem.
12. Mid-brain--middle section of the brain.
13. Monocular--using one eye at a time.
14. Neurological organization--total functional development of the central nervous system, culminating in complete lateral dominance.
15. Pons--upper section of the brain stem, a bridge of connecting tissue between the two hemispheres of the cerebellum.
16. Sidedness--consistently initiating motor functions with the eye, hand, and foot on the same side of the body.
17. Sleep pattern--position of the head and limbs in repose.
18. Spinal cord--longitudinal nervous tissue in the spinal column.

CHAPTER II

REVIEW OF THE LITERATURE

A review of the literature centers primarily around the relatively recent works of Doctor Carl H. Delacato and his associates at the Institutes for the Development of Human Potential at Philadelphia, Pennsylvania.

Delacato summarizes the rationale on Neurological Organization in his latest book⁷ as follows:

The basic premises of the concept of Neurological Organization in the diagnosis and treatment of reading problems are as follows:

1. Reading is a perceptual act and is a function of the human nervous system.
2. The human nervous system is the result of a phylogenetic process.
3. The ontogenetic development of each individual's nervous system, in general, recapitulates that phylogenetic process. Man has superimposed one unique aspect upon that neurological development--cortical hemispheric dominance.
4. The basic difference between the nervous system of man and that of slightly lower forms of mammals lies not in the number of cells, but in the differentiation and organization of those cells. Thus, we have for man the concept of Neurological Organization in addition to neurological development.
5. Neurological Development is a "whole". If any aspect of it is not complete, those that follow will be adversely affected. It must be diagnosed and

⁷ Carl H. Delacato, Neurological Organization and Reading. Springfield, Illinois: Charles C. Thomas, 1966, pp. 5 and 6.

treated as a whole. Segmentation into parts results in misdiagnosis, and poor treatment follows.

6. Deprivation, trauma, or enrichment all affect the development and organization of the human nervous system.
7. Children who have problems with reading have either been traumatized or have been deprived environmentally, resulting in a lack of complete Neurological Organization which, in turn, creates the reading problem.
8. The diagnosis of a reading problem, therefore, becomes an evaluation of the state of Neurological Organization.
9. Where development or organization of the nervous system is found lacking, increased opportunity for its development must be given if the reading problem is to be eliminated.
10. Reading problems can be avoided by the prevention of trauma to the nervous system and by providing maximal environmental opportunity for the development and organization of the nervous system.

This summary of the theory of Neurological Organization by Delacato contains the essence of the literature. For guidance in application, a teacher could follow Delacato's book on diagnosis and treatment.⁸

Amplification of the basic ideas involved constitutes much of the remainder of the literature; some is repetitious. Professionals who are working with the theory can use the more sophisticated presentations; scientific researchers will utilize the statistical versions. The works vary in depth.

⁸Delacato, The Diagnosis and Treatment of Speech and Reading Problems. Springfield, Illinois: Charles C. Thomas, 1963, pp. 47-67.

Delacato, in searching the literature, found a pioneer in the field of neurological development. Samuel T. Orton, in 1928, had written:

That hemisphere⁹ in which destruction produces loss of the associative function is called the dominant hemisphere, and may be either the left or the right, according to the side which habitually initiates the motor responses of the individual. In other words, it is obvious that the visual records of one side only are used in symbolic association and those of the other are elided or inactive in this process.

Working from this lead, under the guidance of Dr. Temple Fay, dean of American Neurosurgeons, Delacato developed his theory on central neurological organization and presented his findings¹⁰ in 1959. This was the explanation given:

Neurological organization is that physiological optimum condition which exists uniquely and most completely in man and is a 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 in humans 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 with 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 from right to left). This progression is an interdependent continuum, hence if a high level of development is unfunctioning or incomplete, such as in sleep or as a result of trauma, lower levels become operative and dominant (mid-brain sleep and high cervical pathological reflexes). If a lower level is incomplete,

⁹Samuel T. Orton, "Specific Reading Disability-Strephosymbolia," Journal of the American Medical Association, April 7, 1928, pp. 1095-1099.

¹⁰Delacato, Treatment and Prevention of Reading Problems. Springfield, Illinois: Charles C. Thomas, 1959, pp. 3 and 4.

all succeeding higher levels are affected both in relation to their height in the central nervous system and in relation to the chronology of their development. Man's only contribution to this organizational schema is that he has added the vertical progression, the final lateral progression at the level of the cortex. Here, again, at the cortical level, the same premises apply. The final progression must become dominant and must supersede all others. Prerequisite, however, to such dominance is the adequate development of all lower levels. In totally developed man, the left or the right cortical hemisphere must become dominant, with lower pre-requisites met, if his organization is to be complete. In the event that there is some obstruction to this (complete development), communication and language dysfunctions occur . . . the two hemispheres of the brain, although they mirror each other physically, have different functions. Trauma of the controlling cortical hemisphere results in loss of tonal factors. The rationale is aimed at improving communication functions and not basic intelligence.

Ontogenetically, children at birth are tonal in nature (vowels for cooing, etc.) and remain somewhat ambidextrous until about the age of six and a half years at which time a dominant hand and foot and eye become established . . . so neurologically, intellectually, socially, and emotionally (they are) ready to read at about this age.

As they develop skill in language, the tonal expressiveness decreases; as skill is used in phonation and speech, unilateral handedness appears. Concurrently, the dominant area of the cortex should become the controlling cortical hemisphere.

Delacato traces neurological development through its various stages as follows:¹¹

1. Medulla and spinal cord--at birth--involuntary tonic neck reflex, movement of the limbs with limited movement of the body.
2. Pons--at the age of three to twenty weeks--crawling, alternate use of the eyes and of the ears.
3. Midbrain--at the age of seven to nine months--creeping, addition of the third dimension in the use of eyes and ears.

¹¹Ibid., p. 20.

4. Cortex--at the age of one year--talking and walking, developing into cross-pattern walking by the age of three or four.
5. Cortical Hemispheric Dominance--between the ages of five and eight--one side of the brain becomes the controlling hemisphere and consistently initiates action, thus establishing sidedness.

In a unified developmental pattern, there is corresponding development in the areas of audition, vision, general physical control, and dominance.

As Delacato indicates in his first book, this development is an interdependent continuum. No steps may be skipped and none can be taken out of proper sequence. If development is incomplete, one must go back to the last truly completed step and continue from that point.¹²

Dysfunction manifests itself in the following problems: aphasia, delayed speech, stuttering, retarded reading, poor spelling, poor handwriting, and reading which falls within the normal range, but is below mathematical performance. Contrary to earlier thinking¹³ these are varying degrees of the same problem and need the same treatment, albeit, in varying degrees.

Treatment is preceded by diagnosis in which neurological development and organization are evaluated. When trained per-

¹²Delacato, Treatment and Prevention of Reading Problems, op. cit., p. 19.

¹³Delacato, The Diagnosis and Treatment of Speech and Reading Problems, op. cit., p. 8.

sonnel is available, refined data can be collected for a basis for treatment. The Doman-Delacato Developmental Profile can be used as a guide. Less scientific evaluation can be achieved by informed parents and teachers through observation of hand, foot, and eye preference as well as the sleep and creep patterns.

Treatment¹⁴ involves the use of heat, cold, sound, and carbon-dioxide as stimulants in the proper performance of the patterned exercises. All efforts are directed toward the eventual establishment of definite laterality.

If neurological organization is important in the development of the child, parents will want to do all they can to remove obstacles and to foster healthy growth. The following guidelines, gleaned from the Delacato literature, may prove helpful:

1. Picking up a child from a crawling or creeping position develops in it a feeling for a vertical position and so discourages the very activity necessary to good development.
2. A play pen militates against necessary activity by confining the child to an area which makes it necessary for him to limit his activity.
3. By observation and intelligent guidance, parents can develop dominance by artfully placing or handing materials to the child.
4. Skillfully chosen toys, such as a kaleidoscope, can play an active and important part in developing dominance.

¹⁴Delacato, Treatment and Prevention of Reading Problems, op. cit., pp. 26-72.

5. Until dominance has been indicated, the crib can be placed with the headboard to the wall and both sides away from the wall. When preference has been established, it can be moved to the wall in such a way that the child, when prone, has his subdominant side away from the wall.
6. The child's sleep pattern can be observed, as it is a clue to the level of his neurological development.
7. At meals, seating can be staggered, so that the child will not tend to mirror or imitate a person sitting directly opposite him.
8. ALL eating utensils can be placed on the preferred side until dominance has been established.
9. An effort can be made to avoid two-handed toys, such as a two-gun holster. These only tend to confuse the child and delay establishment of dominance.
10. A parent can demonstrate new games and toys, showing the proper hand and sighting choices.
11. The child can be encouraged to use the preferred hand with such early skills as crayoning, puzzle play, and finger painting.
12. Swimming and piano lessons, which develop both sides, can be postponed until dominance has been fully established.
13. Musical recordings can be used with the child after sidedness has developed.
14. Stereopticon-type toys can be given to the child after he is reading well.
15. Special attention can be given to left-handed children, as they are living in a right-handed world which offers few left-handed articles.
16. Exercises can be done at home if they are done under the guidance of the teacher or some competent person.
17. Parental vigilance and effort can bring the child through this period of developmental infancy so that he will have achieved readiness for the tasks expected of him when he enters a classroom at school. This will make great demands on the parents in terms of time and effort involved, as it is essential that continuity be unbroken.

Marshall McLuhan warns of the complications¹⁵ which result from deep involvement in Television viewing:

. . . It is not really the content of TV, however, that entrances the young. It is the experience of this amazing instrument that enthralls them. For example, one by-product of their involvement is to be seen in the almost pathetic effort to get more deeply involved in the printed page by holding it unnecessarily close to their eyes. This is not a physiological but a psychic response. There is nothing wrong with the eyes of most of these children who have moved into the five- or six-inch distance between them and the printed page. Just as TV has entered them, they are trying to enter the book. When a child reads at a six-inch distance from the page, it is impossible to focus both eyes on the page; and the result is that many of the TV generation have developed habits of monocular or one-eyed vision that cannot be corrected by glasses

Doctor Edwin LeWinn, research director of the Institutes in Philadelphia, cautions parents in these words:¹⁶

If you keep a child clean and fed but in a crib constantly for as short a time as three months he will be retarded. Even if you put him back in his normal environment, he will still be retarded to a degree.

Delacato assures parents that they can help¹⁷ to prevent reading problems by providing ample stimuli to develop every area of the child's central nervous system in proper sequence. He theorizes that, given a neurologically ideal environment, it seems possible to develop normal children into astonishingly better students.

¹⁵Marshall McLuhan, "What TV Is Really Doing To Your Children," Family Circle, March, 1967, pp. 33, 98-100.

¹⁶Joan Beck, Unlocking the Secrets of the Brain. Chicago Tribune, 1964, p. 10.

¹⁷Ibid., p. 25.

What the parents fail to achieve will need to be done by the teacher, working with the child directly or through the parents. Familiarity with the regimen will enable an experienced teacher to incorporate the Delacato exercises into the regular classroom procedure. Group work can be efficient if there are helpers. A cooperative effort in combination with the Physical Education Department might enrich the physical fitness program. A favorable response and cooperation on the part of the parents is crucial; week-end continuity is imperative.

A growing awareness¹⁸ of the Delacato approach prompts a response which ranges from dedicated and grateful enthusiasm to disbelief and even intense hostility. While parents, including physicians,¹⁹ bring their children to Delacato for treatment and ultimate cure, others demand scientific proof for the theory of neurological organization.

Search for this scientific proof is being watched with great interest. Some of the more important work in this field includes the following:

Ten separate, independent studies by Educators are reported in Delacato's latest book.²⁰

¹⁸ Albert Q. Maisel, "Hope for Brain-Injured Children," The Reader's Digest, October, 1964, p. 140.

¹⁹ John Bird, "When Children Can't Learn," The Saturday Evening Post, July 29, 1967, p. 28.

²⁰ Delacato, Neurological Organization and Reading, p. 62.

For six years, Delacato and his associates have been trying to interest universities and/or rehabilitation centers in a cooperative, large-scale study²¹ on the subject in order to compare the Delacato results with those of more conventional treatments. A 1965 beginning, involving Johns Hopkins, the University of Pennsylvania, the National Institutes of Neurological Diseases and Blindness, and foundation money, did not develop.

Pennsylvania's Department of Public Instruction conducted its own test in cooperation with Lehigh County's school system, with psychologist John R. Kershner in charge. The test involved trainable retarded children whose I.Q.'s were mostly below fifty.²²

While both the control group and the experimental group made gains in physical control, only the experimental group gained in the areas of learning ability. Their mean gain of twelve points was paralleled by a mean drop of three points on the part of the control group.

The Psychologist who conducted the study believes this to be the first experimental research program which yielded a gain in I.Q. on the part of trainable retarded children. The study will be repeated with a larger number of children over a longer period of time.

²¹ John Bird, "When Children Can't Learn," The Saturday Evening Post, p. 28.

²² Ibid., 200173

A study by Melvyn P. Robbins²³ seemed to yield negative¹⁴ results. He later indicated that the study needed to be repeated.²⁴

A study by Wyatt E. Stephens, Ernest Cunningham, and B.J. Stigler reports no significant difference in the reading readiness of children after the Delacato exercises. Their list of References lacks a number of the Delacato books, even though the study was reported in 1967. Their negative results in mathematics actually support the Delacato theory, but they do not seem to be aware of this fact and so they suggest that the findings might be spurious.²⁵

Delacato is now using computers to check the results of his own findings in an effort to detect significant trends.²⁶

The Institute now has a chair of Anthropology,²⁷ endowed by the United Steelworkers, and occupied by world-famous physician and anthropologist, Doctor Raymond Dart of South Africa. His work will supplement the studies which the Institute has been conducting among primitive tribes.

²³Melvyn Robbins, "A Study of the Validity of Delacato's Theory of Neurological Organization," Exceptional Children, April, 1966, pp. 517-523.

²⁴Melvyn Robbins, Delacato Revisited and Response, Exceptional Children, November, 1966, pp. 199-202.

²⁵Wyatt Stephens, Cunningham, and Stigler, "Reading Readiness and Eye-Hand Preference Patterns in First Grade Children," Exceptional Children, March, 1967, pp. 481-488.

²⁶John Bird, op. cit., p. 28.

²⁷Ibid.

CHAPTER III

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

SUMMARY

This review of literature investigated the Delacato theory of Neurological Organization in an effort to assess its usability as a deterrent or remedial tool in meeting the needs of a group of school children who are learning to read.

CONCLUSIONS

A consideration of the Delacato theory of Neurological Organization leads one to conclude that it might be well for classroom teachers to put the theory to a practical test in a regular classroom situation.

A normal reaction to the theory is that there might be problems involved which would require the help of a physician and/or ophthalmologist.

Wholehearted cooperation on the part of the parents would seem to be essential to the success of the program. It was also considered to be desirable to initiate a parent education program as a means of prevention of unnecessary problems.

RECOMMENDATIONS

On the basis of information gained from this review of the literature on Neurological Organization, this author re-

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RECOMMENDATIONS

On the basis of information gained from this review of the literature on Neurological Organization, this author re-

commends that classroom teachers acquaint themselves with the basic concepts of this relatively new theory with a view to possible research in this field. They would profit from gaining as much experience as possible and from observation at centers which are operating successfully. There are such centers springing up across the country, and this author is aware of a number of them, including the South Bend, Indiana Public School System which will apparently initiate the program for the coming school year.

A Certified Neurological Reading Specialist could be made available to teachers as a resource person.

A program of Delacato exercises initiated on the Kindergarten level might prove rewarding. Helpers could be utilized for more complete supervision of children during the exercises to insure effective procedures when the entire class is working in unison. Parents might be instructed in means of cooperation and reinforcement. The Delacato system might be worked into a physical fitness program with gratifying results. This area has not as yet been explored or the results have not as yet been made available for general use.

Members of the medical and visual professions could provide invaluable service in the testing of this theory if they participated in the one-week intensive orientation course given by medical doctors who are members of the training staff at the Institute in Philadelphia.

Teachers might try to interest their Administrative staff in the possibilities of such a program.

A "Game" approach to the experiment would insure that the children would give spontaneous response.

Group exercises could be efficient if helpers were available to ascertain that the exercises were being done correctly.

Slacks and coveralls would be desirable attire for the children. Knee pads could also be used, or strips of carpeting could be used as "trails".

A program of planned exercises (minimum) such as the following might be helpful:

Septemeber:

first half of the month: 15 minutes of crawling (homo-lateral)
 remainder of the month: 15 minutes of cross-pattern crawling

October and November:

ten minutes of crawling
 five minutes of creeping

December and January:

five minutes of crawling
 ten minutes of creeping

February:

ten minutes of creeping
 five minutes of cross-pattern walking

March:

five minutes of creeping
 ten minutes of cross-pattern walking

April:

ten minutes of cross-pattern walking
 five minutes of right hand-right eye dominance (or left for left-sided)

May and June

five minutes of cross-pattern walking
 ten minutes of right hand-right eye dominance (or left)

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