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A CRITIQUE OF NEUROLOGICAL ORGANIZATION AND READING

by Wilma H. Miller and
Gerald A. Koski

The techniques proposed by Carl Delacato of the Institute for the Achievement of Human potential in Philadelphia for the prevention and correction of reading disability have been used with children who are neurologically impaired, disabled in reading, or mentally retarded.

This article proposes to answer the following questions about neurological organization and reading:

What is the history of the study of neurological organization?

How is neurological organization related to reading?

What is the outline of the Delacato approach to neurological organization?

After evaluating objective research, what are the uses of the Delacato approach to neurological organization?

After reading the answers to these questions in this article, it is hoped that the reader can formulate his own reactions in the area.

What is the History of the Study of Neurological Organization?

This account of the history of the study of neurological organization necessarily must be quite brief. In 1896 Morgan was the first to describe a form of neurological disorganization which was related to reading as being congenital word blindness.⁽⁸⁾ Then in 1916 Hinshelwood suggested that word blindness might be the result of improper development of or damage to the visual memory centers of the

brain — the gyrus angularis and the gyrus supermarginlis of the left hemisphere of the brain.⁽⁸⁾ Therefore, until 1928 researchers believed that congenital word blindness was caused either by localized brain injury or improper development of certain focal areas of the brain.

However, in 1928 Orton, an American neurologist, proposed another type of neurological disorganization which he called strephosymbolia, which means "twisted symbols." He stated that strephosymbolia was related to reading problems, and was evidenced by mirror writing and mixed dominance. He also stated that there was no relation between malformation of the angular gyrus and reading disability.⁽⁷⁾ In 1937 Orton stated that if one brain hemisphere is injured, the other hemisphere takes over the functions of the injured hemisphere. He therefore thought that reading disability was a functional disorder which resulted from the failure of one brain hemisphere to be dominant over the other hemisphere.⁽⁹⁾

Influenced by the theories of Orton, Goody and Reinhold later said that children with congenital word blindness suffered from lack of asymmetrical function of the two brain hemispheres which resulted in an inability to coordinate sensory functions.⁽⁸⁾

Recently Kephart stated that a child must establish laterality if he is to be able to understand certain spatial relationships. If he cannot understand such relationships, he will not be able to distinguish such letters as "b" and

“d” or “q” and “p” or such words as “was” and “saw.”⁽⁶⁾

During the last decade Delacato has proposed his own theory of the relation between neurological organization and reading disability. According to Delacato, the vertical pattern of neurological organization progresses up through the spinal cord, medulla, pons, midbrain, cortex, and finally to cortical hemisphere dominance. Delacato suggested that damage at the midbrain level will block the development between this level and the cortical level hindering language and reading skills. In this case, Delacato said that a child can improve with proper patterning which serves to achieve the more complex organization which is required for cortical control, the highest level of human neurological organization. Delacato further stated that when his neurological organization is complete, a disabled reader will begin to improve.⁽⁴⁾

How is Neurological Organization Related to Reading?

Poor neurological organization can be related to some types of reading disability. For example, dyslexia often is defined as minimal brain dysfunction which results in reading disability. Alexia can be defined as reading disability which results from damage to the angular gyrus of the dominant brain hemisphere.

At present there is considerable confusion on the relation between laterality and reading disability. Belmont, for example, discovered that disabled readers performed significantly below normal levels of expectation on tasks of left-right orientation.⁽¹⁾ Benton and Kemble also have suggested that confusion in left-right orientation may well be related to verbal facility.⁽⁸⁾ Clements has found that laterality confusion seems to be more related to the

performance IQ rather than to the verbal IQ of a disabled reader. He also stated that in many disabled readers their left-right orientation seems to be more like that of younger children rather than that of children their own age.⁽⁸⁾

Delacato also has tried to relate neurological organization and reading. He has said that seventy percent of the disabled readers who are referred to reading clinics are afflicted with disorders which result from poor neurological organization. Delacato analyzed forty-five boys who are disabled readers. He found the following traits in these boys:

Fairly Common:

1. history of allergies, asthma or choking during the first six years of life.
2. hyperactivity in babyhood or childhood.

Common:

1. poor penmanship
2. poor gross coordination
3. poor manual dexterity
4. tendency to read or write backwards in the first grade
5. history of a severe childhood illness or head injury

Universal:

1. early childhood thumbsucking of the thumb on the dominant hand
2. posturalization during sleep with the subdominant hand
3. made a better score on test 5 or 6 (which tests the sub-dominant eye) on the Keystone Telebinocular
4. gave some evidence of perceptual confusion in spelling and reading
5. some birth complication or longer period of labor than other children in the family
6. some lack of unilaterality
7. understood and used more words than he could read⁽⁴⁾

What Is the Outline of the Delacato Approach to Neurological Organization?

If there is a relation between neurological organization and reading, one should know the assumptions on which the prevention and correction of reading disability caused by inadequate neurological organization are based. Delacato formulated the following five assumptions:

One: Date indicates that language is controlled at a cortical level in the following way. The dominant side of the cortex controls the skill facets of language, and the subdominant hemisphere controls the tonal facets of language.

Two: Man differs neuro-muscularly from lower forms of animals in that he operates in a dominant-subdominant pattern. In modern man one side of the cortex takes over most of the skill activity in which man is engaged.

Three: Cortical localization as an absolute, when dealing with the complexities of language, is invalid. Localization related to language must be made in terms of the dynamics of cortical function rather than in terms of specific topological or cellular locations of cortical function.

Four: Peripheral modalities such as vision dexterity, phonetic analysis and various reading techniques, are meaningless in correction if the total neurological organization is defective.

Five: Children must be evaluated and treated at a wholistic level.⁽⁴⁾

Delacato stated that both the prevention and correction of reading disability caused by poor neurological organization are the same in many ways. He believed that each child must progress through a series of activities which can help him to develop neurological organization. If an older

child is a disabled reader, the activities which he missed must be provided him. Delacato has developed a series of tests to discover which developmental state a child is functioning on, and the activities must begin on that stage.⁽²⁾ A complete description of the various stages is found in the books *A New Start for the Child with Reading Problems*⁽²⁾ and *Diagnosis and Treatment of Speech and Reading Problems*.⁽³⁾ However, here is an outline of these stages:

Stage 1 (birth to six months of age, level of pons)
one-sided crawling
the proper sleep position
one-eared conversation
visual practice

Stage 2 (six months to one year of age, level of midbrain)
cross-pattern creeping
hearing practice
using music such as primitive folk-type melodies
games requiring memories of sounds
visual practice following a moving target

Stage 3 (one year to eighteen months of age, cortical level)
cross-pattern walking
hearing practice
visual practice in the third dimension
general coordination practice involving running and jumping

Stage 4 (eighteen months to two years of age, cerebral dominance)
eliminating music from the environment
handedness activities
writing letters and numbers on the chalkboard
winking
sighting through a telescope or microscope
target sighting
peephole practice

After Evaluating Objective Research, What are the Uses of the Delacato Approach?

Since Delacato's neurological approach to reading disability is very different from traditional approaches, it has received much criticism. Most of the research studies involving these techniques have been criticized mainly in terms of research design rather than in terms of the technique themselves. For example, Glass has examined many of the research studies which used the Delacato techniques. He has criticized them greatly in terms of research design. Glass believed that Delacato did not understand the regression effect in research design. Of the eleven studies which he evaluated, five did not have a control group. In summary, Glass stated that the claims made by Delacato are not justifiable in terms of the design of the experiments.⁽⁵⁾

Reading disability is a very serious problem in the United States today, in the typical middle-class suburban school about twenty-five percent of all students are disabled readers, while in the typical inner-city school about fifty or more percent of the students are disabled readers. Therefore, any approach or theory which can help to prevent or to correct this serious problem must be examined very carefully.

Certainly poor neurological organization is not nearly so common a cause of reading disability as has been stated by Delacato. However, undoubtedly it does cause reading problems in some few students. It appears that no final determination can be made on the usefulness of the Delacato techniques until substantive objective research has been conducted which clearly proves their values with disabled readers. Since the research on these techniques has been so strongly criticized in terms of research design, they cannot now be recommended as a major method of preventing or treating reading disability. However, in an area as important as reading disability, we cannot afford to fail to put any theories to objective tests, no matter how unique they may seem to be.

Summary

This article presented the history of the study of neurological organization from 1896 until the present. It also described how neurological organization is related to reading in such areas as dyslexia, alexia, and left-right orientation. The article briefly gave the stages of development through which a child must pass in order to attain complete neurological organization according to Delacato. Also included in the article were recommendations on the present usefulness of the Delacato techniques.

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