

# **THE 3 R's**

**READING RIGHTING  
REHABILITATION**

**Neurological Rehabilitation**

**THE DELACATO  
METHOD**

**Robin Burn I Tech. AIMMM**

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READING RIGHTING REHABILITATION  
NEUROLOGICAL REHABILITATION  
THE DELACATO METHOD**

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## PART ONE

# THE ONTOGENY OF READING PROBLEMS

Dr Carl H Delacato

The ability to learn to read, the ability to learn to express oneself starts from birth on. If one is not afforded the opportunity to develop total neurological organization, the child cannot become totally human and as a result cannot communicate at the level, at which the child might have been able to, had neurological organization been completed.

Based on the rationale of neurological organization, prevention of communication dysfunction is very possible. It must be based, however, on the premise that there are significant developmental stages of neurological organization which cannot be bypassed, and as the child reaches each stage chronologically he must be given every opportunity to master the functional neurological activities at that level before moving on to the next. With such a logical approach to child education we could, in the future, become able to prevent the problems which face us today by seeing that every child is given opportunity to develop wholly and completely in terms of functional neurological organization.

The title, " The Ontogeny of Reading Problems" is I am sure somewhat surprising. Instead of this title, we could entitle this paper, " The Development of a Reading Problem". In the field of the language arts, we have spent our greatest efforts in attempts to ameliorate such problems and it is my purpose here to present to you the development of such problems. Perhaps, viewing, our language problems from this point of view might give us a somewhat different form of insight into the types of problems which we encounter with children who are disabled in some phase of language and communication functions.

We would all agree that reading is a developmental process. I am sure that we would all agree that agree that reading is basically a receptive act, that it consists primarily of visual reception and, at some levels, auditory reception and perhaps kinesthetic reception are involved. We also know that we, as educators and as a reflection of a culture, measure the proficiency with which a human being deals with the process called reading, via expressive modalities. We, therefore, measure what is basically a receptive act by its expressive concomitants.

If we follow this sequentially we have the fact that the reading process is basically receptive and that we measure the effectiveness of the reading process primarily expressively .If one, therefore, has difficulty with the reading process, we know that he has difficulty with it because he lacks expressively, since we measure his function via an expressive mode.

Carried on step further, we ascertain the aggregate expressive distillate of the perceptual process of reading .We evaluate the percepts by measuring and evaluating the concepts formed on formed on the basis of those perceptual skills.

In the past we have confused the process of learning and mastery of communication skills by going from concept, which, we use as our measuring technique, back to percept. We must all agree that logically we develop perceptually and then move on to concept in the development of language abilities.

The great majority of our reading problems are receptive problems. They are problems of perception .We find that, even those children suffering from a lack of comprehension, which certainly indicates a conceptual lack, are suffering, not from conceptual problems but from perceptual problems. When we give such children instructions orally we find that they can understand and comprehend and conceptualize the same words and sentences which they cannot comprehend and conceptualize via reading. Our natural conclusion must be that this is the result of poor percepts on which they are basing their resulting inadequate concepts.

Receptive problems are the result of faulty or incomplete neurological organization. These problems are created long before educators, ever see the children. These perceptive problems can be diagnosed long before children are generally seen in pre-schools. These problems can be treated long before educators see them in schools. Finally these problems can be can be prevented.

A lack of adequate neurological organization can be the result of a genetic bias. This represents a very small percentage of our problems .A second area of etiology is a trauma This again is a small percentage of our population .The third etiological area is the area of lack of environmental opportunity for complete neurological organization. This group represents by far the greatest majority of our problems in the area of communication.

Diagnostically we can begin to assess the etiology of such problems prior to birth. A family history helps to give us an insight into the existence of that small group which is potentially genetic in etiology. Birth data of early childhood illness and trauma give us an insight into the second small group, the group which is the result of a traumatic etiology.

The third, and by far the largest group (that group which is the result of environmental deprivation) can be seen if we view the child in sequential stages from a developmental and functional neurological bias.

For our purposes of looking at the development of a reading problem, let us look at this largest group. Let us look at the significant stages of development to see how the lack of opportunity for complete neurological organization at each successive stage of neurological development relates to the ontogeny of a reading problem. For our purposes,

let look at the successive stages receptively in terms of audition, vision and expressively in terms of movement.

As the child who has had a non-traumatic birth arrives at 3 to 20 weeks of age we find that his mobility consists of creeping on his stomach in a homolateral pattern. That is, the child moves forward with the arm and leg on the same side of the body extended and the arm and leg on the opposite side of the body flexed. His head turns toward the flexed side and as he moves, this body position is reversed. The mobility is aimed in a two-dimensional world toward seeking vital and basically crude comfort. If we view the child at this age from a visual point of view, we note that this body position places eyes in such a position that the child is binocular in visual performance. That is, as the right arm and leg come up, the right eye looks at the right hand, the left eye does not. It remains somewhat strabismic. As the position is reversed, the left eye looks at the left hand and the right eye has no part in the visual process. At this stage the child operates visually binocularly, using only one eye at a time just as one side of the body at a time in the homolateral pattern.

The same is true in audition. At this stage the child cannot place sound in space simply because auditorially the child receives the stimulus from one ear or the other. This total performance lies in terms of neurological organization at the level of the Pons. This is basically a one-sided level of function. Mobility is homolateral, or one side used for propulsion at a time, vision is binocular, audition is binaural.

When the child moves on to the level of the mid – brain at the age of 7-9 months, we find a whole new area of function arising. The child, in terms of mobility, adds the third dimension to movement. The child now crawls on hands and knees and the stomach is no longer in contact with the floor. Significantly, as the child moves now, the opposite appendages are used for propulsion. In other words as the child moves, the right hand and left knee are used at one time and then the left hand and right knee are used for propulsion. The child has become a cross- patterned organism. The child no longer one-sided, but now is distinctly two -sided. The child has become a bilateral human being.

In vision, at this stage, the child begins to use eyes in concert. The child no longer uses one eye at a time in a monocular fashion. Instead, the child uses the two eyes in concert and here is the beginning of binocularity. Those children who present to us later in the developmental picture a lack of good binocularity are children who have not been given adequate opportunity to develop binocularity at this stage of development, which is the responsibility of the mid-brain. Such children, who are not given adequate opportunities for creeping, later develop problems for which binocularity is a variable.

In audition the same phenomenon takes place at the level of mid-brain. During the 7 to 9 month development levels the child learns to place a sound in space. The child becomes binaural, that is, tends to use two ears in concert. The stimuli are mediated and the child can place a sound in space.

We have all seen these children to whom we could not teach phonetics, no matter how hard we tried. In our investigations we find that those children are lacking in this very

basic binaural skill, which is a function of mid-brain and not of the cortex, as we had assumed in the past. Children who are not afforded the opportunities for development at the level of mid-brain in the area of vision, mobility and audition at the ages of 7 to 9 months are beginning to develop significant problems in communication. If they lack binocularity, binaural function and mid-brain overall responsiveness we have started them on their way toward a disability in language.

As children reach one year of age they become cortical creatures and they move from bilateral activity, binocular and binaural, to a new level of function, that is stereo or depth within their receptive and expressive mobilities. Children from the age of one on begin to develop stereopsis in vision. This must be superimposed upon strong binocularity. They begin to develop stereophonic abilities in hearing which must be superimposed upon strong binaural activities. They begin to develop true cross –patterned walking which must be superimposed upon the more elemental mid-brain cross-pattern crawling. Indeed at this time in the other areas of receptiveness they have developed from the level of the Pons, at which they were able to receptively discriminate between very painful and very strong stimuli along to the point at the level of the cortex wherein they have developed complete stereagnosis receptively.

In a few short years from birth the child has moved from being one-sided to being two-sided and now must move on to the final human level, that of developing or superimposing upon this developmental continuum cortical hemispheric dominance. Here is where man is unique in neurological terms. Man is the only creature who has developed one hemisphere, which is dominant over the other hemisphere. As a result man is the only creature who has a symbolic language.

As a child begins to make early choices of sidedness, the culture must give opportunities to reinforce this sidedness so that the child develops complete unilaterality, which results in one-sidedness, the child can begin the process of becoming completely human in terms of his receptive and expressive abilities.

This sequential continuum, called neurological organization, ends at about the age of six, or about the age when generally we begin the formal teaching of reading. To recap, the whole process of development of readiness to read begins at birth. It goes on to the level of Pons , which functions in an alternating one-sidedness, to the level of the mid-brain which is two-sidedness, to the level of the cortex, which encompasses stereo functions, to the level of the development of complete cortical hemispheric dominance. This continuum forms the basis of human perceptual abilities.

Perception is a fundamental process. We learn to see in varying stages and in varying ways; we learn to move in varying stages and varying ways; we learn to hear in varying stages and varying ways; we learn to feel in varying stages and varying ways. There are no shortcuts to these developmental processes in any of the sensory modalities, sequentially, logically and according to the development of the human nervous system. Only by going through the process as nature intended it to be can we form good perceptual abilities.

Superimposed upon the development of perceptual abilities are the apperception's which we build from our experiences which, in turn, result in conceptualization and the ultimate in reading, which is human conceptual comprehension. The ability to learn to read and the ability to learn to express oneself starts from birth on. If one is not afforded the opportunity to develop this total neurological organization, they cannot become totally human, and as a result, cannot communicate at the level at which they might have been able to, had the neurological organization been complete.

To diagnose our language problems, therefore, we must start at the age at which we first see the child, but we must look back developmentally to the original area of the dysfunction. As a result, it may be that in terms of the diagnosis, some of our children are not well developed at the level of the Pons, some at the level of the mid- brain, some at the level of the cortex and some at the level at cortical hemispheric dominance. If we are to diagnose validly and reliably, we must go through each succeeding stage to assess the mastery of function at each stage.

Treatment must also follow this sequence. In treatment we must go back to the original point of departure from development norms and we must re-create for that brain level and that chronological level, those functions so that the child can go through the proper developmental stages and begin to move on to the establishment of complete neurological organization .In, we must start at the lowest level at which there appears to be a lack of neurological organization and we must give the child the opportunity to master the activities and functions of that level and of each succeeding level until we have mastered complete cortical hemispheric dominance.

Based on the rationale of neurological organization, prevention of communication dysfunction is very possible. It must be based, however, on the premise that there are significant development stages of neurological organization which cannot be by-passed and as the child reaches each stage chronologically he must be given every opportunity to master the functional neurological activities at that level before moving on to the next. With such a logical approach to child education we could, in the future, become able to prevent the problems which face us in education today by seeing that every child is given opportunity to develop wholly and completely in terms of functional neurological organization.

Presented to Claremont Reading Conference 1963

## PART TWO

# Neurological Organisation

### The Delacato Method for the Rehabilitation of Neurologically Dysfunctional Individuals

In his paper "Ontogeny of Reading Problems" presented to Claremont Reading Conference in 1963, Dr Carl Delacato, ED. D reasoned that the process by which one attains the ability to learn to read - the ability to learn to express oneself starts at birth .If the child is not afforded the opportunity to develop total neurological organization, the child cannot become totally " human ", and as a result cannot communicate at the level at which the child might have been able to, had neurological organization been completed.

Based on the rationale of neurological reorganization, prevention of communication dysfunction and, as well, the development of meaningful communication is very possible. It must be based, however, on the premise that there are significant development stages of neurological organization which cannot be bypassed, and as the child reaches each stage chronologically, it must be given every opportunity to master the functional neurological activities at that level before moving on to the next. With such a logical approach to child development, we could become able to deal with the problems that face us today, by seeing that every child is given the opportunity to develop wholly and completely in terms of functional neurological organization.

Prior to the presentation of this paper at the Claremont reading Conference, Carl Delacato had spent over 10 years developing the theories on which his paper was based; studying cultures around the world and working with and studying children and adolescents with varying degrees of communication and development delay problems. This research led to his premise that all the affected individuals studied, had either an incomplete neurological development, or had received, or been subjected to an event which interrupted the natural sequence of development leading to complete neurological development. His two books published in the period up to 1963 outline his rationale and treatment regime, which leads to neurological completion and thus to the individual to achieving meaningful communication.

It is the contention of Delacato International, that individuals exhibiting development delay, neurological dysfunction, behavioral problems, learning delay, communication problems, etc essentially came to be as a result of incomplete or disrupted neurological organization.

A lack of neurological organization can be the result of a number of factors. It can be the result of a genetic bias; this is known to represent a small percentage of the problems. It

should be pointed out that genetic research in this area is still ongoing, and experts agree that there is still not enough knowledge to be absolutely certain that this is a contributor. A second area of etiology is trauma (by this we mean physical, biological or environmental). The third etiological area is the area of the lack of environmental opportunity.

Diagnostically we can begin to assess the etiology of such problems prior to birth. A family history helps to give an insight into the existence of that small group, that which is potentially genetic in etiology. Birth data, early childhood data, illness, and encephalitis give us an insight into the second group of a traumatic etiology. The third, and that group, which lacked environmental opportunity, can be seen if we view the child in sequential stages from a developmental and functional neurological bias

Data collected from our clinics in Europe suggest that one third of children not attaining successful neurological development, were born with a problem which hindered complete neurological development, another third were subjected to birth trauma. The last third appear to be the result of environmental disturbance or environmental deprivation.

At the start of this treatise it was argued that neurological reorganization is the pathway to help neurological dysfunctional individuals overcome their problems. We now know that the root cause of neurological dysfunction that creates conditions that we label Dyslexia, Dyspraxia, ADD, ADHD, PDD, Asperger Syndrome, Autism etc, has its origins in a mild organic diffuse brain injury acquired by the individual in early stages of development, or as a result of incomplete neurological organization during development.

The acquired brain injury disturbs the functions of the central nervous system (CNS) and thus disturbs the sensory perceptual systems (i.e., hearing, seeing, smelling, touch and taste).

The use of EEG tracings, CAT scans, MRI scans, or other high definition images, can now detect even the smallest discontinuity or anomaly in the brain.

As an example, a recent study published August 2002 by Sommer, et al based at the Universities of Hamburg and Goettingen, who conducted research into individuals who stuttered using the latest high definition scanners, found structural anomalies in the left hemispherical cortex region of the brain.

Analysis of data available to Delacato organizations worldwide concerning individuals presenting with some form of brain scan and EEG's showed the following. There was a preponderance of mild dilation of the ventricular system visible in scans leading to a natural conclusion that these children surveyed as a group, lacked gross pathological defects of the structure of the brain, but still showed evidence of mild changes to the structure, and hence function of the brain. EEG studies tended to show dysrhythmia. Typically these disorganized EEG's showed a preponderance of slow wave activity with

a significant percentage showing “spiking” as well. Most of the EEG’s were abnormal and non-specific.

All individuals displayed soft neurological signs, lack of coordination, development delay, strabismus, laterality dysfunctions, toe walking, attentional aberrations, and significant learning delay.

Studies of individuals were and are carried out to ascertain the incidences of various types of sensory perception problems; within the groups the findings are as follows;

Tactility problems 90-100%.

Auditory problems 80-90%.

Visual problems 60-70%.

Taste and smell 25-30%.

Children with tactility problems presented a hypotactile picture in a 2:1 ratio over hypertactile. A great majority of hypertactile individuals present a sensitivity and or hyper-reactivity to food colourings, preservatives, drugs and certain food types.

A 3:1 ratio of hyperauditory over hypoauditory patients was observed.

A 3:2 ratio of hypervisual over hypovisual was reported.

Only a small percentage presented problems of smell and taste.

Children with at least 2 hyper areas (excluding taste and smell), e.g. vision, auditory or tactility, have a prognosis for progress is quite good, children with no areas of hyper senses but with all areas as hypo made least progress.

The basic treatment technique for all patients visiting the Delacato Clinics is firstly, an evaluation, secondly an individualized home programme specifically designed to normalize the sensory channels of that child. This programme is taught to the child’s parents to carry out at home. Later programmes are aimed at improving each patients general development based on progress and observations made during follow-up consultations.

The second stage of rehabilitation is to address the sensory problems identified and administer the programme therapy.

At this point it is important to understand what is termed neurological organization. Previously brain growth was considered a static and irrevocable fact, completed and unchangeable at birth and if injured could not be altered.

The theory of neurological organization views the growth and organization of the brain very differently. Recent studies confirm the ability to influence brain injury, growth and recovery.

Each child must follow an essential sequence of experiences and development laid down by revolutionary heritage. This development and organizational sequence begins prior to birth, progresses vertically through the spinal cord, then through the brain stem and medulla, the middle brain up through the two hemispheres of the cortex. In humans uniquely, there is one final stage in this developmental progression. This is a lateral

development wherein one hemisphere of the cortex becomes the language or dominant hemisphere of the brain.

As a result of this uniquely human final lateral stage, man becomes the only creature who is correctly one sided, that is right handed, right eyed, right eared and right footed or conversely, left side usage of all sensory gathering organs, and thus only man has been able to develop written or spoken language.

Treatment is based on recapitulation. If a development stage is missed or not completed, the child is given the opportunity to go back through the experience. We have seen many children who have completely missed the creeping stage (on hands and knees) of progression. It is known that the brain can become better organized if significant development milestones are retraced, and re-experienced. Children are taken back to a function typical of a younger age, we then have to practise the related motor functions that reinforce their sensory and neurological development. When lower level stages have been mastered, lateralisation can then take place making them all one sided.

Based on this theory, the child's development is evaluated based on significant areas of development. These areas are subdivided into the sequential order and time schedule in which they appear in non compromised children.

There are three major intakes or sensory areas.

1] Vision; beginning at birth with a light reflex and progressing through 7 stages to understanding writing.

2] Hearing; beginning at birth with a startle reflex and progressing through 7 stages to understanding speech.

3] Tactility; beginning at birth with tactile withdrawing reflexes and progressing through 7 stages to the ability to recognize two-dimensional objects through manual tactility.

The profile also contains 3 expressive areas each of which also progresses through 7 development stages.

1] Mobility; 7 stages through movement without mobility to normal walking.

2] Manual function; 7 stages from grasp reflex to ability to write.

3] Language ;7 stages from birth cry to human speech.

Treatment consists of providing the child with the opportunity to go back and re-experience the stage(s) in which it exhibits a weakness. Remember steps to speech and language reading and writing are through crawling on the stomach to creeping on hands and knees, to walking upright to language and recognition.

Final development only takes place when intermediate stages have been successfully accomplished.

At this point we can start to address the sensory perceptual problems of the individual.

Recall we mentioned the senses, which govern our lives and enable us to understand and interpret the world around us and survive in that world.

There are two major sensory dysfunctions, hypersensitivity and hyposensitivity plus a third, less prevalent one we call white noise. Hyper individuals receive too much information from the environment which overloads them, and may result in their “switching off” as a form of defense mechanism. Hypo individuals do not receive enough stimuli and are starved of outside information. White noise, like static on a radio also blocks out the normal stimuli.

To read the sensory problems of the individual, one need only observe the individual; the actions will point the observer to the problem. These actions can be viewed as the individuals attempt to treat it himself.

A fish out of water placed near to water will flap itself vigorously on the land. We may view its convulsions as a sad reminder of the frailties of life – the death throws of a “lost cause”, or are they an attempt to move itself back into the water its natural environment? If the fish is close enough to the water it will often succeed and thus save its life.

Recall the conclusions of studies of sensory impaired children. 90-100% have tactility problems.

Hypertactile children shy away from touch, they do not welcome contact and are sensitive to certain types of fabrics, are happier wearing loose fitting garments rather than tight fitting ones and take off any garments they are not comfortable with. These are the children you cannot take out of the bath, and the ones you cannot get into the shower.

Hypotactile children are the self mutilators, biting hands, fingers, hitting heads, sometimes against walls, doors, anything to try to induce a sensation.

Recall an earlier comment about children showing reactions to certain food types and foods containing preservatives flavour enhancers, food colourings, these are the children with severe hypertactility problems. The surface hypersensitivity is skin deep as our skin layer contains millions of nerve cells transmitting information back to the central nervous system. From a perceptual point of view, the skin on the outside of our bodies is essentially the same skin lining of our total digestive system. Hyper sensitivity on the outside becomes hypersensitivity on the inside increasing the chances of the chemicals in the food we eat, and the liquids we drink, reacting adversely on children with hypersensitive stomach linings.

Now to Auditory problems, we know that three times as many children are hyperauditory than hypo. These are the children who put hands to ears, put fingers in ears, run away from busy environments, scream in noisy rooms. These are the children, who can and do fail the standard listening tests because they have the ability to switch off their hearing when it becomes an overload for them.

In the inner ear we have the mechanism which maintains our balance, as hyper auditory children do not use their auditory system efficiently this balancing system is not being used effectively. Hyperauditory children often have no fear of heights can perform amazing balancing acts and can spin themselves without becoming dizzy.

Turning now to visual problems, again hypersensitivity is prevalent. This manifests itself by the children who do not make direct eye contact; often looking at you sideways. They blink in bright sunlight, and often perform visual stereotypes involving hands, paper, or strings.

These children are trying to reduce the amounts of visual stimuli entering the system, turning them off when they cannot cope.

Finally we come to taste and smell, usually these act in tandem, as these two sensory gathering systems are intimately connected. Only a small percentage of autistic children are affected. Hypertaste / smell children tend to be picky eaters, eating mainly bland foods, sometimes no solids at all, while hypotaste/ smell children eat and drink everything, especially strong taste and strong smell items – often to their own detriment.

As a rule, mildly affected individuals show two or more hypersensitivities and no hyposensitivities, and are the easiest to rehabilitate. Individuals with hyper and hypo take longer and need much more therapy.

On the positive side children having had hypervisual and hyperauditory sensory problems essentially see everything better than the average child, hear everything, miss nothing and have an incredible memory. This child has the ability to learn better than the average child yet is often misdiagnosed as mentally retarded.

These children do not have learning difficulties; they have essentially no problems with input only output. What underlines the sensory perceptual problems are development delays due to their adversely affected sensory systems. Once these sensory problems have been rectified, and the ability to learn and develop has been given back to our children, (ideally with hemispherical dominance being attained), the ability to master written and spoken language can be achieved.

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Robin Burn    Director

A NEW START FOR THE CHILD WITH READING PROBLEMS:  
A MANUAL FOR PARENTS

By CARL H. DELACATO, ED.D

This exciting book details a curative therapy for the serious reading difficulties which afflict many children. It presents Delacato's developmental approach to reading and learning; moving through creeping and crawling, through walking and on to brain and language dominance

In "A New Start for the Child with Reading Problems" Dr Carl Delacato suggests reimplanting the early stages of dominance training by repeating the early steps of crawling and other physical exercises that properly develop the receptivity of the language area of the brain.

Other Books by Dr Delacato;

"The Treatment and Prevention of Reading Problems"

"The Diagnosis and Treatment of Speech and Reading Problems"