

Reading and the Autistic Child

The basis of a movement therapy programme, Sensory Integration Therapy for Neurological Rehabilitation being used in school environments dedicated to the education of special needs children has been established within the Westminster Governments' Department for Education and Skills. (1)

In their document "*Planning, teaching and assessing the curriculum for pupils with learning difficulties*", accessible via www.nc.uk.net/ld/index.html they offer the following guidance;

Physical education; Opportunities at Key Stage 1

Much of the programme of study at Key Stage 1 is relevant to pupils with learning difficulties. With modification, it can provide stimulating and challenging learning opportunities. All pupils can contribute in group work with others at their own level of ability.

The document suggests pupils explore basic body movements and actions using different parts of their bodies. To acquire and develop skills, suggesting, crawling, sliding, rolling, moving backwards and forwards. To select and apply skills, tactics and compositional ideas, be helped to follow and respond to simple instructions for example stop and start. At Key stage 2, the document suggests listening and responding to action words, for example, walking, marching on the spot. Suggesting, as part of games activities, ball games, catching, throwing, on the floor foot skills of passing, dribbling. Throwing and catching bean bags, all as part of hand eye coordination programme, to develop binocular vision.

The Welsh Assembly Government, in their recently published guidance document (2) "*Routes for learning*", affirms that, "This guidance document, written to support the use of the Routes for Learning materials, offers an overview of the main theories and background information, underpinning the effective teaching and assessment of learners with profound, and Multiple Learning Difficulties". In the Additional Guidance section, the document suggests that therapies, including movement therapy, and occupational therapy to address sensory impairment, could be included in the curriculum design. The rationale for this is explained in the premise that inhibiting factors in the student's ability to learn is irrefutably connected to sensory impairments exhibited by students with learning delay. The document outlines the reasons for the sensory impairments linked to retained inhibitive reflexes. Addressing these inhibitive reflexes being the key to improved learning ability.

It is essential to recognise that the physical exercise components of the DfES document, and movement therapy in the Welsh Document are the core elements of Delacato Therapy, evolved from the ideas of neurologist Dr Temple Fay (3).

In the published work (4) "*Using a developmental movement programme to enhance academic skills in grade 1 learners*" Fredericks, Kokot, Krog, describe a rigorous experimental programme to associate the benefits of physical exercise movement to cognitive learning and academic skills and investigate the efficacy of a movement programme on the academic skills of early learners

In their opinion "The results of the pre-testing and post-testing indicate that the learners of the experimental group showed a significant improvement in spatial development as well as in reading and mathematical skills, compared to the learners in the control group, free-play group and educational toys group".

In support of the rationale behind their experimental programme, the authors cite Summerford, (5), that physical education is often seen as a frill, and has been discontinued in many South African schools, which might be a misguided kind of thinking

The authors, drawing on the works of Kephart (6), Ayres (7), Delacato (8,9), and the recent works, brain research of Pica (10), De Jager (11), suggest, "in effect, that the body, as a sensory-motor response system, causes the brain to learn and thus to organise itself. The premise that movement (physical education programmes) is the sole mechanism for effective remedial action has to be viewed with caution. Feigley (12), (1990), proposes that physical education programmes need to more than mere physical fitness regimes. Likewise according to Corrie and Barratt-Pugh, (13), report on studies showing that certain perceptual motor training was not an effective intervention technique for academic cognitive or perceptual-motor variables. The results show little effect in any developmental domain, even on children's gross motor skills. Furthermore, the programmes made little difference to the reading, arithmetic, language or spelling of children with learning difficulties or of normally developing children. However, even though it may initially seem that Corrie and Barratt-Pugh do not accept the theory that movement leads to learning, they do state that it is not the importance of perceptual-motor development that is disputed, but the way of supporting and facilitating that development that is critical.

According to the authors Fredericks et, al a sensori-motor movement programme should be aimed at the root cause of learning difficulties. On the basis that vestibular, proprioceptive, tactile visual and or auditory systems are dysfunctional, the child will fail in its attempts at academic work. Kokot, S.J. (14)

For decades, it has been well established that one child in five has serious reading difficulties. Many systems of special teaching have been tried.

In his paper "Ontogeny of Reading Problems"(15) presented to Claremont Reading Conference in 1963, Dr Carl Delacato, Ed.D reasoned that "*the process by which one attains the ability to read – the ability to learn to express oneself starts at birth. If the child is not afforded the opportunity to develop total neurological organisation, 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 organisation been completed.*" The 1963 paper, and his book in 1970, both stem from original research. (16) In this paper the principles of Sensory Integration Therapy are proposed.

In 1970, Carl Delacato (17) proposed a new revolutionary concept together with a new curative therapy, outlined in his book, " A New Start for the Child with Reading Problems". In his book Delacato describes his work as being hard in as much as it presented a new approach to reading problems; reading problems were the result of lack of development of the nervous system, especially in the development of complete one-sidedness.

Delacato notes that the previous book relating reading to brain function was written in 1923 by Dr Samuel Orton, and now he was to resurrect and add fuel to that old fire in educational circles.

Dr Orton, a clinician and prominent dyslexia researcher, hypothesised that normally developing readers suppress the visual images reported by the right hemisphere of the brain because these images could potentially interfere with input from the left.

Using functional magnetic resonance imaging to study brain activity in children, researchers led by Dr Guinevere Eden (18) at Georgetown University Medical Center confirmed part of an eighty year old theory on the neurobiological basis of reading disability, and shed new light on brain regions that change as children become accomplished readers. Advanced technology allowed the researchers to discover that children do in fact turn off the right side of their visual parts of the brain, as they become accomplished readers. This confirms an aspect of Ortons' work - borne out of observations of individuals with reading disability - is correct.

To put this theory into its simplest terms, systems of reading and language difficulty, show up where there is conflict between one side of the brain and the other to gain language dominance.

In the human brain the language area is usually located in either, the left, or right side of the brain. Likewise, man is usually left- handed or right- handed.

Normally, dominance in the brain begins as soon as baby learns to speak, total dominance achieved around 7 to 8 years of age. Theoretically, a missing of any stage of development between crawling, creeping, walking, seeing, talking and writing creates problems in reading.

In November 2003 researchers led by Dr Mark Wallace (19), report that Dyslexia may stem from how the brain processes sight and sound together rather than simply a problem decoding the written word. They go on to suggest "For the first time, there is evidence that dyslexia is a *multi- sensory disorder*. It is not solely a problem with visual processing or with language", "our study suggests that it is actually a problem combining visual information with auditory information." "Early reading involves matching what you see with what you hear. The sights and sounds of words are inappropriately matched. So, while the average person very quickly matches the written word "dog" with the sound "dog", a child with dyslexia may have much more difficulty".

Man is unique in the fact that the species is the only life form that has developed a written form of communication, which developed from his ability to communicate orally in the form of speech. Having established this premise it has to be cautioned that the ability to read and write is not dependent on the ability of the individual to use coherent speech. This is true of many autistic children with little or no vocabulary being taught to read and write and autistic children with coherent language not being able to read and write. One thing however is certain that that both cohorts of children are capable of being taught reading and writing by developing the conditions that enable written language to be both taught and learnt.

A spoken and written language is the result of having sidedness and uniqueness of a brain, which contains an upper portion divided into two halves, the cortex. The uniquely human characteristic of sidedness developed in man has one half of the cortex becoming the dominant, language-controlling hemisphere, and the other becoming sub-dominant.

The ability of a child born without the encumbrance of a traumatic birth process and incident free pregnancy, to develop a written language is a precise process, any part of that process being missed or not totally developed compromises the process and inhibits the end result of written language and the ability to read written language.

To understand the reasons why the compromised process inhibits reading and writing is firstly to understand the precise developmental processes, which lead to reading and writing, and only then, can we understand why children, born with a traumatic birth procedure after a problem pregnancy, are unable to read and write. Only by this understanding can intervention be applied to correct these inadequacies.

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.

The remainder of the presentation goes on to outline the rationale of his premise, by presenting the etiology of brain injury, which leads to the development of sensory problems, and the retention of inhibitive reflexes, which hinder the natural development sequence, and create lost opportunities, such as, failing to crawl on hands and knees, before walking.

I have discussed elsewhere "Making Sense of the Senses"(19,20) the subject of sensory dysfunction of the autistic child as well as the subject of retained inhibitive reflexes, (acquaintance with the work of Sally Goddard on the reflexes is recommended).

Delacato goes on to say "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, and 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 addition 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 stereognosis 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.

Here is now outlined a beginner's guide to the causes, recognition of, and description of how to overcome the child's difficulty.

There is an increased risk of mild diffuse brain injury, leading to reading difficulty and learning delay, from, difficult pregnancy, difficult birth procedures, including emergency and elective Caesarian section delivery, and early post natal period up to 6 months. The child who misses a stage of development i.e. crawling and creeping increases the risk of reading problems and learning delay.

In the event that the parent believes that such an event, like viral or bacterial infections, risk of miscarriage during pregnancy, premature birth, a birth procedure longer than 12 hours or less than 2 hours, has occurred, should be aware of increased risk to the normal development of the child. A Caesarean Section birth, increases risk as this is invariably less than 2 hours.

The next critical stage is at approximately 5 months when the child should start to creep on hands and knees. In the event that the child wants to start to walk without creeping, the parent should ignore this wish, and encourage the child to creeps on hands and knees for at least 4 months. After which, walking erect is then allowed.

Should you now recognise that you have a problem with your child, then the following rehabilitation can be practised.

For children over the age of 2-3 years and up to the age of 5 years, the following exercises can be carried out.

Each exercise to be carried at least twice a day, for a duration of 2 minutes each exercise, for a minimum of 4 months until you believe your child has improved to your satisfaction

Creeping on hands and knees for at least 4 months.

Rolling the child on a well-carpeted floor or alternatively on the bed up and down. You do the rolling, do not allow the child to do it itself.

Slow controlled spinning in a revolving chair, alternatively rotating 3 times to right and 3 times to left. You spin the child, remember that children spinning and rolling themselves are self-stimulation, you spinning the child is therapy.

Catching and throwing balls, rolling balls, catching after one bounce, catching balloons, chasing bubbles, kicking balls.

Record the preference of which hand the child uses to pick up objects and holds a pencil. If the predominance is right hand, then you will create the brain dominance on the left side of the brain, left-hand preference creates right hand side dominance of the brain.

For the child older than 5 years of age the encouragement of the use of hand, eye, foot, and hearing on one side of the body only, is necessary to create the condition for effective reading and writing.

When you have determined which hand your child prefers to use you can then reinforce this preference to fix the handedness and make your child all one-sided, and achieve hemispherical dominance.

This you can do by ensuring he always uses his preferred hand to write, pick up objects, throw and catch balls.

Next ensure that when he starts to walk from a standing or sitting position, he starts to walk always using his leg which is on the same side as his preferred hand. With ball games roll the ball to the foot you want your child to kick back to you with.

A good exercise for footedness is to stand the child at the bottom of the stairs and have the child place the preferred foot on the first step and then return to normal standing position. Repeat the exercise until this becomes a natural instinct.

To ensure he only uses the correct eye we can use the effect of red/red or red/green filters when the child is writing or reading.

When writing with a red/orange pen/crayon/pencil the words disappear when viewed through a red lens.

Putting a green filter on a page of a book, the words disappear when viewed through red lenses.

To enable the child to use the correct eye, we cover the other eye with a red lens.

The child uses the red lens for 2 minutes twice a day for reading and writing exercises. These exercises continue until you the parent are satisfied that your child has successfully mastered reading and writing.

To complete the handedness and create one-sided dominance in the brain, hearing needs to be addressed. Spend two, five – minute periods each day talking or reading to your child. While sitting on the right side, ask your child to cover the left ear while listening to you. If left-handed, sit on the left side and cover the right ear during listening.

When your child is all one-sided, using eye, ear, hand and foot, on one side of the body only, neurological organisation is complete.

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