Primitive reflexes- a Mind Moves developmental program to support low vision

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This paper is presented from an educational perspective.

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Introduction

The way the eyes are used, and the way the world is perceived through the eyes are the result of a complex network of neural connections, which depend on the maturation of the Central Nervous System (Goddard, 2002). These networks are complex because the eyes are the last of the five senses to mature, building on the structure and functioning of the vestibular system, because visual input is:

- modulated by the vestibular system
- influenced by the limbic system (emotional brain) and
- controlled by the cerebral cortex.

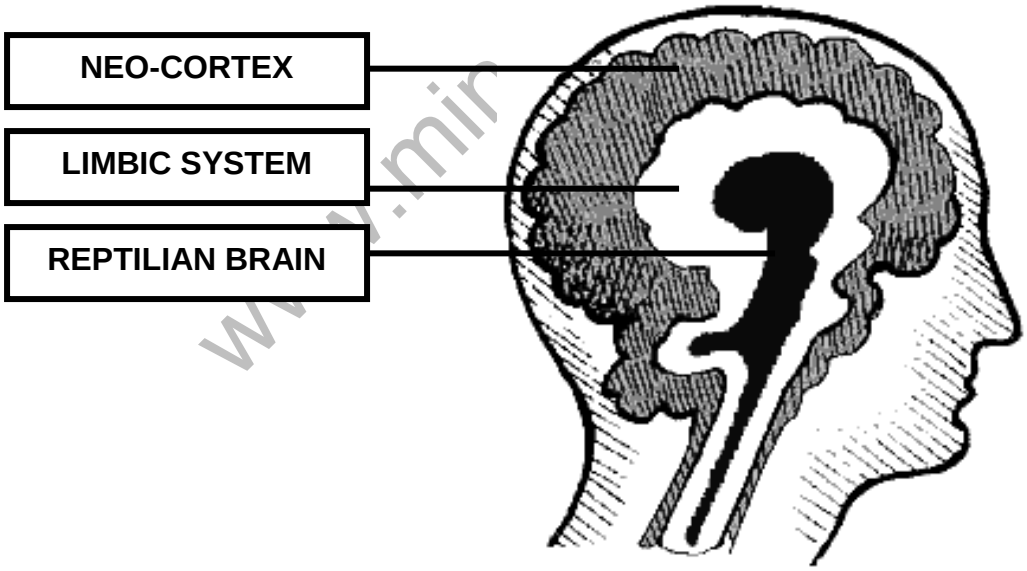

Figure 1 Paul MacLean's Triune brain theory (MacLean, 1990)

The function of the reptilian brain (other than to ensure survival) is to develop the mechanics of the learning process. The learning process is best described by the Information Processing Approach (Sigelman & Rider, 2002) as a process where the

sensory system receives input, the brain processes the information and the motor system acts on the information.

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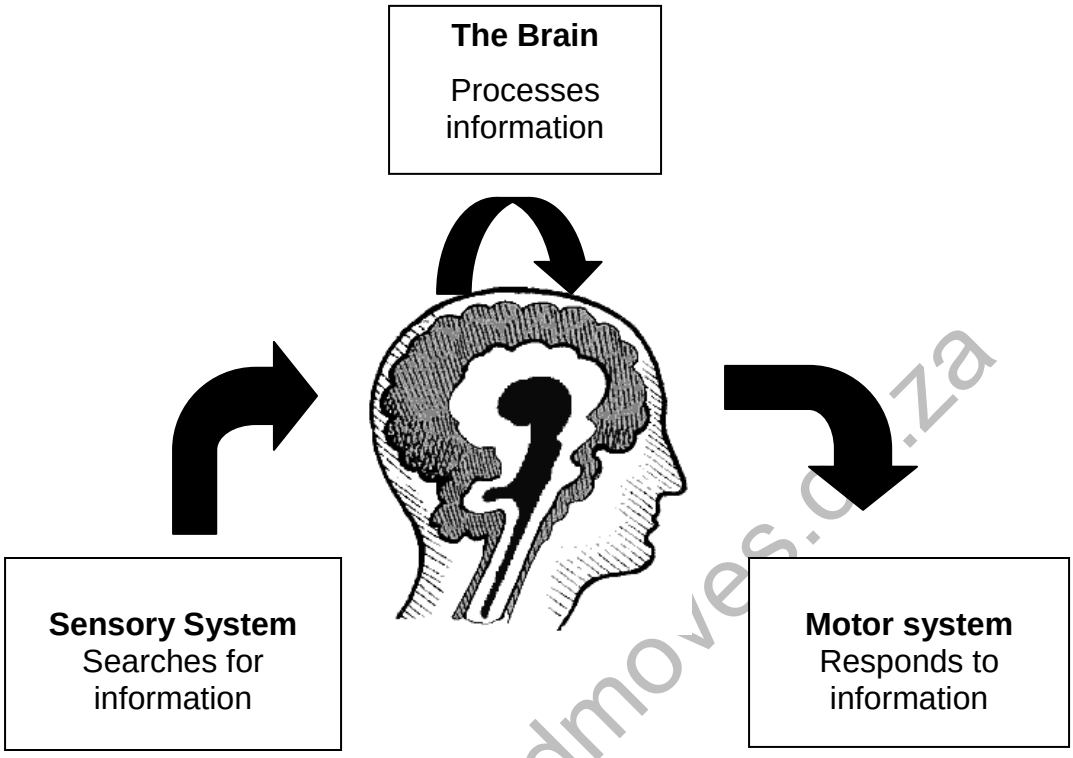


Figure 2 Information Processing Approach

The mechanics of the learning process are the senses, the brain, the muscles and the connective neural wiring. For the purposes of this presentation the focus will be on the development of the sensory and motor systems and the connective neural wiring in an attempt to support low vision.

The sensory and motor systems develop in a predetermined sequence, from the simple to the more complex:

Sensory system	**Motor system**
1. Sense of **touch**	Rooting & sucking
2. Sense of **balance**	Development of neck stability
3. Sense of **smell & taste**	Development of core stability
4. Sense of **hearing**	Rolling over
5. Sense of **sight.**	Sitting up
	Crawling
	Standing
	Walking & stopping.

The complex network of neural connections that ultimately supports the sense of sight develops as a result of a series of stereotype movements called primitive reflexes.

1. The Reflex System

The primitive reflex system is essential to the baby's survival since primitive reflexes act as basic training for all later skills such as sensing, perceiving, listening, talking, playing, drawing, paying attention, reading and writing. Each primitive reflex is an involuntary movement with the purpose of stimulating and strengthening a specific sensory-motor neural pathway. In the course of normal development, each primitive reflex emerges sequentially to fulfill a function before being inhibited, while the responsibility for continued development is then passed on to the next primitive reflex.

The reflex system develops chronologically, which implies that specific milestones should have been achieved by a certain age. Developmental milestones such as neck muscles strength or the ability to roll, sit, crawl, walk and talk are clear signals indicating the effectiveness of the baby's neurological development. Failure to reach these milestones is an indication of neurological immaturity, which may undermine the visual system.

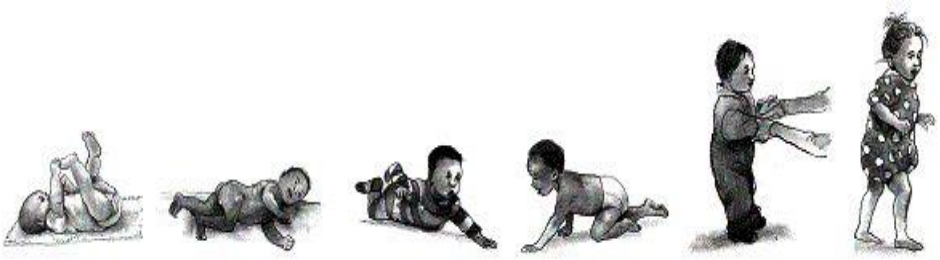


Figure 3 Developmental milestones are indicators of sensory-motor development

Primitive reflexes are specifically designed to have a limited lifespan. Once they have completed their developmental functions, these involuntary movements should retire and allow the rational brain to take control over physical movement. However, when a reflex does not fullfil its function fully, it remains active and acts as a signal indicating some neurological weakness.

Any interruption in the sequence of reaching development milestones result in earlier primitive reflexes remaining active in the system, disturbing the emergence of subsequent reflexes. As a result all further neurological development is be built on dubious foundations. The correct sequence of sensory-motor development is therefore crucial to neurological developmental, which is a vital precursor to motor, perceptual, emotional and cognitive development. If the primitive reflex sequence is interrupted the

body will attempt to compensate, which requires tremendous amount of energy and effort. When a person feels stressed and tired, he might not have enough energy to compensate and tend to struggle to cope. Under these circumstances the aberrant reflexive behavior often becomes more noticeable.

In order to understand what goes wrong when reflexes are aberrant (do not retire), it is important to know what function each individual reflex performs.

The following Primitive & Postural Reflexes are involved with visual development:

PRIMITIVE REFLEXES		
	REFLEX	**FUNCTION**
	Moro Reflex	Vestibular function Divergence/peripheral vision
	Rooting & Sucking Reflex	Eye teaming skills Convergent/central focal vision
	Tonic Labyrinthine Reflex	Near/far and far/near accommodation Vestibular-Ocular Reflex Arc
	ATNR	Eye-hand coordination Arm-length focal vision Horizontal tracking / ocular pursuit
POSTURAL REFLEXES		
	REFLEX	**FUNCTION**
	STNR	Binocular vision Vertical tracking
	LHRR & OHRR	Fixation Visual attention

The vestibular system is at the core of functioning - developed at 8 weeks in utero, operational at 16 weeks and myelinated at birth.

Body reactions and posture are mediated by the cerebellum (responsible for movement) together with the vestibular system (responsible for balance, direction and orientation). Problems in the cerebellum and/or vestibular system affect all sensory systems and posture “because all sensations pass through the vestibular mechanism at brain stem level before being transmitted elsewhere for analysis” (Goddard, 2002).

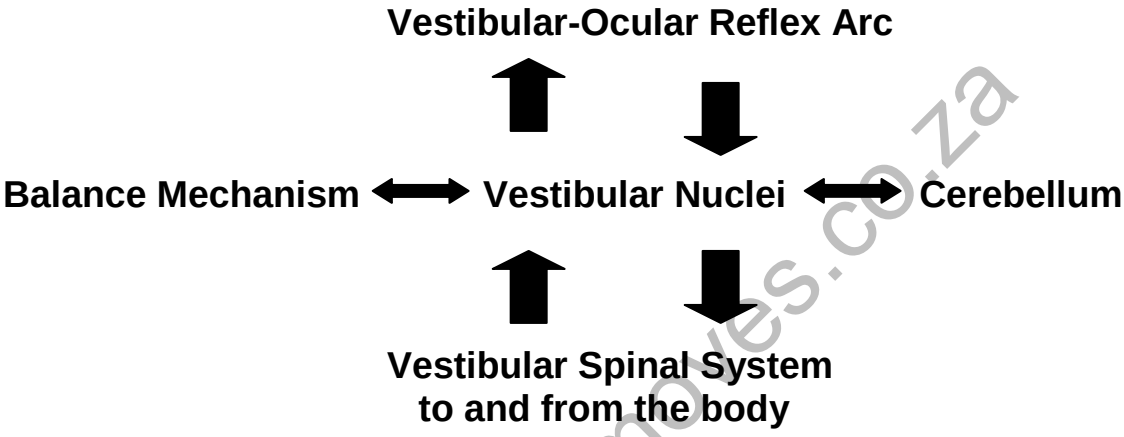


Figure 4 Vestibular-Ocular Reflex Arc

King & Schrager (1999) confirms the importance of vestibular involvement by stating that 90% of the cells in the visual system respond to vestibular activation. Both the vestibular and reflex systems act as substructures upon which oculo-motor; visual-perceptual skills and eye-movements are built (Goddard, 2002).

It then follows that specific movements (as stimulated by the reflex system) develop and strengthen the complex nerve networks, which are at the foundation of optimal vision and improved posture.

Once you have eliminated the impossible, whatever remains, however improbable,
must be the truth.
Sherlock Holmes

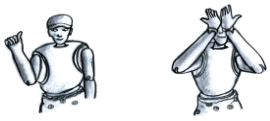
Mind Moves® and the development of the visual system

If primitive reflexes are still functional (aberrant) in a person older than 12 months, a reflex inhibition program is necessary to develop the corresponding immaturities in the CNS (Blythe, 1979:12; De Jager, 2006:49-52; Goddard, 2002:1).

Mind Moves is a reflex inhibition program using simple physical movements to mimic the natural reflexive patterns as seen in babies. As each reflex is responsible for the development of a specific part of the CNS, the purpose of Mind Moves is to activate those aberrant reflexes casing neurological immaturities. With repetitive activation of the aberrant reflex(es), the corresponding parts of the CNS can be developed and the function of the reflex would be fulfilled. The reflex would then become inhibited and stay in a state of rest ready to be reactivated when injury to CNS occurs due to injury or trauma.

As with emotional or mental barriers to clear vision, neurological immaturities can not be addressed with lenses only. Lenses may enable a person to compensate for neurological immaturities, but to promote a flexible visual system – a reflex inhibition program is recommended.

Mind Moves to stimulate and inhibit primitive reflexes involved with visual development

REFLEX	FUNCTION	MIND MOVES
Moro Reflex	Peripheral vision	**Rise and Shine** 
Rooting & Sucking Reflex	Eye teaming skills Central focal vision	**Power On** 
TLR	Near/far and far/near accommodation Vestibular-Ocular Reflex Arc	**Focus Adjuster** 
ATNR	Eye-hand coordination Arm-length focal vision Horizontal tracking/ocular	**Visual Workout** 

	pursuit	
STNR	Distant vision Binocular vision Vertical tracking	**Mouse Pad** 
LHRR & OHRR	Fixation Visual attention	**Abs Trainer** 

* These are samples of Mind Moves, for more comprehensive information or to order a copy of ***Mind Moves – moves that mend the mind*** by M de Jager visit www.mindmoves.co.za.

It is commonest of mistakes to consider the the limit of our power of perception is also the limit of all there is to perceive.
C.W. Leadbeater

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