

Viewpoint: Correcting Clinical Facts- Abnormal Primitive Reflexes in Behavioural Optometry and Vision Therapy

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Abstract

As early as 1969, the role of retained or residual primitive reflexes was discovered, by one of the authors of this paper (Blythe), to play a significant role in specific learning difficulties, agoraphobia and panic disorder. At the same time, a protocol for neuro-diagnostic assessment based on standard medical tests was devised to detect the presence of aberrant reflexes (neuromotor immaturity) in older children and adults, and developmental movement programmes were devised to inhibit and integrate aberrant reflexes. This system, now known as The INPP Method, has been shown in peer reviewed journals to bring about remission of presenting difficulties both educational and medico-psychological.

Evidence has emerged showing that a number of behavioural optometrists and practitioners of vision therapy are using clinically unknown diagnostic procedures to test for the presence of aberrant reflexes, misinterpreting observations during the assessment of primitive reflexes, and applying clinically unproven reflex inhibition programmes without a clear understanding of the developmental basis for some of the exercises used in relation to primitive reflexes. These failures appear to be the result of inadequate and misleading training which is being communicated to others through various publications, training courses, seminars, and information given out to patients and families of patients. This viewpoint article highlights some of the issues involved.

Key Words

assessment, primitive reflexes, reflex inhibition, remediation, theory, training

Introduction

In 1995 an article, *“The role of primitive reflexes in the development of the visual system,”*¹ written by one of the authors (Goddard), was published in the *Journal of Behavioral Optometry*. Since that time the authors have been made aware of an increasing body of incorrect information concerning the assessment, interpretation, and remediation of primitive reflexes appearing in publications and training materials disseminated amongst practitioners of vision therapy and behavioural optometry.

It is not possible to produce an exhaustive list of all examples as the distribution appears to have been widespread from disparate sources over a number of years, and has spilled over to and from other professions. Some examples, which are listed in two sections below, provide evidence that a problem exists, and that there is a need for rigorous academic review of the literature being produced for the purposes of training, assessment, and remediation of primitive reflexes amongst practitioners of behavioural optometry and vision therapy to insure the integrity of the profession and to safeguard patients.

Section 1 lists errors which relate to the administration of test procedures for the assessment of primitive and postural reflexes and the interpretation of the function of primitive reflexes in normal development, followed by factual clinical comments.

Section 2 lists examples of distorted interpretation or potential misuse of existing methods for remediation of aberrant reflexes, followed by factual clinical comments.

Section 1. Examples of errors in test procedures and interpretations

Issue 1

Two publications produced for optometrists advocate use of test procedures designed to elicit “soft signs” of neurological dysfunction to identify signs of abnormal primitive and postural reflexes. These are described in the first publication² as:

- a) *Walking with the feet turning in (pigeon toed)*
- b) *Walking with the feet turning out (Charley Chaplin position);*

and in the second publication³ as:

- c) *The “Duck” Walk (walking with the feet turning out)*
- d) *The “Pigeon” Walk (walking with the feet turning in).*

In the first publication, under the heading *“Clinical Picture if Sustained,”* it is said that if in the above test procedures *“any movement of the feet triggers an obligatory movement of the arms”* (vertical synkinesis (VS)), such signs are *“possibly caused by the amphibian, labyrinthine or Moro reflex.”*

Issue 2

In the second publication, the “Duck” walk is described as a definitive test for the Moro reflex.

“Moro Reflex Testing Procedure

You will be determining if the reflex is present or not present

Test Part 1: Duck Walk

Instruct the participant to stand with toes turned outward (heels pointing towards each other) and walk forwards 10 steps. Then walk backward 10 steps.

Observations

If the reflex is present, you will observe one of the following. Please check the item as it occurs when testing:

- Inability to turn feet outward
- Any movement of the upper body such as bending forward
- Movement in hands and arms, such as arms turning outward
- Rotation of the hips or upper body, forward posture or an unbalanced posture
- Awkward extension of upper body
- Walking in a stiff or unnatural motion, inability to walk smoothly

If the reflex is not present, you will observe that the participant will effortlessly turn feet outward; the participant will walk forward and backward smoothly while the upper body remains relaxed and hands remain at sides.”

A reflex is an involuntary muscle reaction to a specific type of stimulation in which certain sensations or movements are known to produce specific muscular responses.⁴ Recognised standard tests with defined observations and criteria have been developed and established to assess the presence of reflexes in the neonate⁵ and in the older child.⁶

The Moro Reflex

The Moro reflex is elicited by any movement which suddenly moves the head in relation to the spine. It can be produced by the head and neck muscles participating in a generalised startle reflex,⁷ as in the manoeuvre described by Moro.⁸ It is primarily a vestibular reflex, which is elicited in the neonate by slapping the mattress or by lifting the child from the supine position, and letting the head fall back onto a padded surface.⁹

This reaction occurs in the infant before head-righting reflexes and muscle tone to support posture have developed, and is a reaction to sudden stimulation of the labyrinth or the auditory system. As far as we are aware, there is no evidence to suggest that *altering position of the feet* (as in the Duck and Pigeon Walks) elicits the Moro reflex.

Observations listed under the tests for the Duck and Pigeon Walks may offer “soft signs” of neurological dysfunction, but these soft signs do not afford hard evidence of aberrant reflexes. There can be many reasons for these soft signs – age,¹⁰ orthopaedic structure, impairment of the later-developing inhibitory mechanisms responsible for mirror movements,¹¹ complexity of the movement, order of presentation, familiarity of the task, and lateralization with the non-dominant side exhibiting more overflow,¹² – for the appearance of vertical synkinesis (VS) on various tests for soft signs of neurological dysfunction. Some authors considered VS to be a secondary event linked to interhemispheric interaction in the functional organization of motor acts.¹³ Execution of useless movement during performance of motor activity and/or sleep may represent an expression of the slow maturation of structures responsible for achieving basic levels of inhibitory control,

which is reflected in the performance of complex tasks.¹⁴ It cannot be assumed that such signs elicited when altering position of the feet are a direct result of either retained Moro or Tonic Labyrinthine Reflexes or an absent or under-developed Amphibian Reflex as described above without additional supporting evidence from other recognised tests to assess the status of each reflex.

Issue 3

In the second publication, the author states that the Moro reflex helps the infant “to hold the correct vertical and horizontal positions of the head for the first two months of life.”³

Contrary to the statement made above, the Moro reflex is a reaction to **loss** of head control in the first 2 – 4 months of life. The Moro reflex gradually recedes as a result of maturation in the central nervous system (CNS) as head righting reactions and centres involved in the development of muscle tone and postural control mature.

Issue 4

Under symptoms of the Moro reflex the same author lists, “weakened adrenal glands.”³ No evidence or references to support this statement are provided.

Factual Clinical Comment

Goddard¹⁵⁻¹⁷ described how the continued presence of the Moro reflex in an older child can be associated with an exaggerated startle reaction, which can result in hypersensitivity in one or several sensory channels. This in turn may cause the child to over-react to certain stimuli, increasing activity in the sympathetic division of the autonomic nervous system and increasing the demand for production of adrenaline and cortisol. Such demand on the adrenal system could, in theory, compromise regulation of stress hormones normally reserved to respond to extreme stress and to support the functioning of the immune system. This process is not the same as having “weakened adrenal glands.”³

Issue 5

In a description of a test procedure for the Asymmetrical Tonic Neck Reflex (ATNR), the tester is instructed to place the subject “with hand and knees on the floor in a creeping position and head hanging downward,” and then to “rotate head right and left.”²

Issue 6

A description of the ATNR states that, “It not only assists in the birthing process but also is reinforced and activated by it. This twisting motion is the first experience of the infant to understand coordination of both sides of the body together. Many researchers believe that this is a contributing factor as to why children requiring forceps delivery or born by Caesarean section are at higher risk of experiencing developmental delays.”³ The same author goes on to state that, “one of the biggest factors that cause reflexes to be retained is a traumatic birthing process,” but does not provide evidence to support this assertion of a direct link between traumatic birth and retained reflexes.

Issue 7

Also in relation to the ATNR it is stated, “crawling and creeping are extremely important in the integration of the ATNR at the appropriate time, and children who stand and walk without these intermediate movements often experience a retained ATNR.”³

Asymmetrical Tonic Neck Reflex

The ATNR is elicited in the neonate as a result of head rotation to either side. A. Jean Ayres developed an additional test for assessing the continued presence of the ATNR in older children using the quadruped position.¹⁸ For this test, the head should be held level with the spine. By placing the subject in the quadruped position with “*head hanging downward*,” this procedure could also elicit the Symmetrical Tonic Neck Reflex (STNR) in flexion, causing the arms to flex even if the ATNR is not present,¹⁹ resulting in a false “positive” result for the ATNR.

Goddard¹⁵ suggested that the ATNR may play a part in the normal birth process by lending flexibility to the shoulders and the hips as the baby gradually works its way down the birth canal. It is a quantum leap from this suggestion to state that, “*this twisting motion is the first experience of the infant to understand coordination of both sides of the body together*,” or that “*many researchers believe that this is a contributing factor as to why children requiring forceps delivery or born by Caesarean section are at higher risk of experiencing developmental delays*,” without either providing references to substantiate these statements or making it clear that they are the conjecture of the author.

In a study which analysed responses from parents who had completed the Institute for Neuro-Physiological Psychology (INPP) Developmental Screening Questionnaire about their child, Goddard and Hyland found that problems during the birth process were only *one* of a cluster of factors in early development which could contribute to developmental delay later on. They went further and stated that problems during the birth process were also present in the developmental history of some children who did not experience developmental delay.²⁰

The statement which says, “*crawling and creeping are extremely important in the integration of the ATNR at the appropriate time, and children who stand and walk without these intermediate movements often experience a retained ATNR*” is ambiguous, as it is inhibition of the ATNR (circa 6 months of age), which is important for a child to be able to progress through subsequent stages of crawling and creeping.

Issue 8

Under a section entitled “Overview of the Tonic Labyrinthine Reflex (TLR)” it says, “*It (the TLR) aids in the integration of the vestibular, proprioceptive and visual systems, and is also needed in preparation for rolling over, crawling, standing, and walking.*”³

The TLR is elicited by change in the position of the head in space, which stimulates the otolithic organs of the two labyrinths. Bobath explained that as the labyrinths are fixed within the head, *it is the position of the head itself* which determines the distribution of hypertonus throughout the affected parts.²¹ The TLR is not elicited as a result of alteration of foot position (unless the head position is also adjusted) as suggested in earlier citations of descriptions of the Duck and Pigeon Walks; neither is it “*also needed in preparation for rolling over, crawling, standing, and walking.*” On the contrary, continued presence of the TLR in its crude state will interfere with the ability to roll, crawl, stand, and walk.

Issue 9

In a poster, “Optometric Correlates of Developmental Delay in a Population of Patients with Learning Difficulties,”²²

published online, the original version showed photographs of test procedures for five primitive reflexes in which the first two illustrations described, “*Assessment of the Strauss reflex response for the underlying Tonic Labyrinthine Reflex (TLR).*” The issue was reported to the author and a correction was made immediately, as it was admitted to be a simple mistake in labelling.

The Tonic Labyrinthine Reflex and Strauss Reflex

The test procedure shown for the TLR in the original online document²² is also a test for assessing presence of the Landau reflex. Used in isolation, the test as shown does not provide clear evidence of a retained Tonic Labyrinthine reflex.

It should also be noted that the Strauss and Tonic Labyrinthine reflexes are separate reflexes, which are distinct reactions to different stimuli.

The Strauss Reflex

The Strauss reflex is a startle response elicited by a sudden or unexpected stimulus. The original films of Strauss²³ and Landis and Hunt²⁴ show a difference between the fright (startle) reaction and the *Unklammerung* reflex described by Moro. According to Landis and Hunt, the startle reaction is originally a flexor reaction while the Moro clasping reflex is an extensor reaction. Clarke²⁵ observed that the Moro reflex is the first to appear in the course of development. Later some features of this reaction disappear and extension becomes flexion, as in the startle reaction. While Hunt²⁶ observed that both reactions can be elicited in the newborn during the course of normal development, as the Moro reflex is inhibited, the more mature “startle” response, sometimes referred to as the “Strauss” reflex, takes over. There is no recognised test for both the Tonic Labyrinthine and Strauss reflexes together. The photograph used in the original article is not a test for the Strauss reflex.

Issue 10

The description of the Duck and Pigeon Walks previously cited² stated that these procedures could also elicit possible signs of the amphibian or labyrinthine reflex.

The Amphibian Reflex

The Amphibian reflex is a postural reaction which develops in the infant from about 4 months of age. It is elicited by elevating the pelvis on one side when lying in the prone or supine positions. It enables the infant to use one quadrant of the body independently of the other three, and in the prone position, is a precursor to commando style crawling. Recognised tests for the assessment of the amphibian reflex in the prone position are available.²⁷ It cannot be assumed that signs of VS elicited in the upper body when carrying out either the Duck or Pigeon Walks are the result of an absent amphibian reflex.

The unqualified statement, “*possibly caused by the amphibian, labyrinthine or Moro reflex*” does not make it clear that it is the *absence* of the amphibian reflex in a child above the age of 6 to 8 months which provides an indication of neuromotor immaturity. When referring to the “*labyrinthine*” reflex, no distinction is made between the TLR and the Labyrinthine Head Righting Reflex. This distinction is crucial because the continued presence of the former in a child above 3½ years of age is abnormal, while the absence of the latter in an older child is a sign of neuromotor immaturity.

Issue 11

Under “Observations” for the Spinal Galant reflex, the following signs are listed as being indicative of the reflex being retained: “*arching of the back; curved toes; participant pulling away or bending downward; ticklish or touch sensitive; any motion, even slight, such as movement in the shoulders, back or bending of the arms. This movement may only be one side of the body.*”³

Spinal Galant Reflex

The Spinal Galant Reflex in the neonate is a reaction to stimulation of the dorsal skin in the lumbar region at the level of the first lumbar vertebra on one side.²⁸ “When the dorsal skin, near and along the vertebral column, is stroked, the infant forms an arch with his body; the concavity of the arch is directed toward the stimulated area, and by arching in the opposite direction the infant evades stimulus.”²⁹ In other words, the reaction is an outward movement of the hip on the stimulated side. In the neonate, “this response is elicited by stimulating the paravertebral area with the thumb nail or a sewing wheel going caudal from the lower thoracic to the sacral region. Truncal incurvature is elicited with flexion of the hips on the ipsilateral side.”³⁰ This is a specific reaction to the stimulus.

“*Arching of the back; curved toes; participant pulling away or bending downward; ticklish or touch sensitive; any motion, even slight, such as movement in the shoulders, back or bending of the arms*” could be caused by a number of factors, including tactile sensitivity or being ticklish, and are not a definitive response indicating that the Spinal Galant reflex is present.

Issue 12

Under “STNR Testing Procedure” the following observations are listed:

“*Movement of the head is restricted or there is resistance; the head drops or there are tremors in the body; shoulders/neck/arms are tense.*”³

Symmetrical Tonic Neck Reflex

The STNR, “produces symmetrical changes in the distribution of muscle tone in the limbs in reflex response to the symmetrical change in the position of the head with relation to the trunk. When the head is tilted back (extended), there occurs a reflex increase in tone of muscle groups which extend (straighten) the elbows, wrist and fingers, and a corresponding increase in tone of muscle groups which flex (bend) the hips and knees. On the other hand, when the head is bent forward (flexed), this pattern of muscle tone is reversed.”³¹

Observations for signs of the STNR when tested in the quadruped position are specifically related to specific changes in muscle tone in the arms or the legs in response to flexion or extension of the head. The other signs quoted above are not clear indicators of the STNR being retained.

Section 2. Examples of misinterpretation and inappropriate application of existing methods for the remediation of aberrant primitive reflexes:

Issues 1 & 2

In the preamble to the instructions for the use of an exercise called “The Starfish,” it is acknowledged that the exercise was “*borrowed from Peter Blythe*” and that the author had “*not been trained in Blythe’s methods.*” The author de-

scribes the exercise as: “*the child then thrusts both arms and legs apart and leans body and head backward, again for a count of 10. The child then repeats this two-step procedure several times, alternating right over left and left over right.*”²

In an essay, “The Primitive Reflexes: Considerations in the Infant,”³² a treatment programme for infants is described recommending use of the “Starfish” exercise for children under 5 years of age.

The “Starfish” exercise developed by Blythe in 1990 and originally named “Fetal Movement,” was devised for use with children over 7 years of age with specific diagnostic criteria following a full diagnostic assessment of all of the primitive and postural reflexes. The movement was only intended to be repeated twice at each session. Because the movement both simulates and stimulates the Moro reflex, over-stimulation or inappropriate use of the movement can result in increased hyper-sensitivity, over-reactivity, emotional regression and increase in symptoms in some subjects.³³ Fetal movement was also adapted for use in a school program (Sea Anemone exercise) developed by Goddard Blythe^{34, 35} in which there are only two repetitions of the movement carried out once a day.

Berne makes no attempt in the essay to define at what age “The Starfish” or other exercises outlined in the *Infant Movement Program* he describes might be appropriate, nor does he offer age norms for various tests shown to assess the presence of primitive reflexes in children under 7 years of age. For example, figures 8 and 10 in the publication illustrate quadruped testing positions for the ATNR and STNR in children considerably younger than 7 years of age. In 1975, Parmenter had found a visible ATNR response when tested in the quadrupedal position in most *normal* children through to the third grade.³⁶ In other words, if certain test procedures for reflexes designed for use with older children are used with younger children, the test can yield a false positive result because the test age norm is higher than the chronological age of the child being assessed.

Berne also quotes Goddard as a source to substantiate use of the *Infant Movement Program* described in the essay. He quotes a statement by Goddard made *specifically* in the context of exercises used as part of The INPP Method, “*the reflex movements are based on a thorough understanding of the primitive reflex sequence of development and normal child maturity.*”¹⁶ Goddard never recommended the use of the exercises described as part of the *Infant Movement Program* with this age group, in this context, or without more detailed assessment or further training in the diagnostic techniques and application of exercises which form part of The INPP Method.

Issue 3

In a publication referring to a primitive reflex training program “Vision Therapy at Home,” it is stated that “*The reflex activities included in the program have been proven by researchers and thousands of clinicians to be safe, extremely effective.....*”³

While specific reflex integration programs have been shown to be effective,³⁷⁻⁴⁰ the above statement does not make it clear that these programs are not the same as the one being prescribed in the Vision Therapy at Home program. No reference sources are provided to support the assertion that “*the reflex activities included in the program*” (Vision Therapy at

Home program) “have been proven by researchers and thousands of clinicians to be safe, extremely effective ...”²³

Summary

The examples listed above provide some illustrations of four distinct areas of misinformation:

1. Potential misdiagnosis of aberrant reflexes resulting from misapplication and misinterpretation of test procedures not recognised as valid tests for the reflexes described.

2. False baseline premise for research based on primitive reflexes resulting from use and interpretation of tests not recognised as valid tests for the primitive reflexes described.

3. Use of exercises originally designed for other purposes without training in their original application.

4. Lack of evidence provided to support claims made for specific programs professing to integrate reflexes.

It is our view that incorrect information concerning the assessment and remediation of primitive and postural reflexes is being replicated and distributed to other professionals through various training programs and publications produced for optometrists and parents of children receiving vision therapy. Practice based on this erroneous information appears to be spreading amongst practitioners, there may be some cross-contamination to and from other professions, and incorrect information is subsequently being disseminated as part of professional training to others in the field. In the interests of science, education, ethics, professional practice, clinical standards, valid research, and most importantly, providing better patient care in the future, this must be put right.

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Viewpoint Responses

Dear Dr Taub,

Having been cited in the article “Viewpoint: Correcting Clinical Facts - Abnormal Primitive Reflexes in Behavioural Optometry and Vision Therapy” by Peter Blythe, PhD, and Sally Goddard Blythe, MSc, I felt it would be appropriate to note more about my professional background and the legacy of our understanding of primitive reflexes.

Arnold Gesell, MD, worked with the primitive reflexes 19 years before Mr. Blythe and Ms. Goddard came on the scene. Both Drs. Albert A. Sutton and John Streff had various discussions with me about Gesell’s exploration into the primitive reflexes. My training with the reflexes came from Catherina Johanneson-Alvegard and her development of the reflex integration program in 1975. (There was and still is a dedicated group of optometrists developing and using the primitive reflex program in Scandinavia.)

Dr. Sutton invited Dr. Lena Rasmussen from Sweden (one of Catherina’s students) and Thorkild Rasmussen from Denmark to teach our first course on the primitive reflexes. Dr. Sutton and I also were interested in Goddard’s work and invited her to the United States to present a course, but she never responded to us.

Adding to this early training, I developed my own protocol for ADD-Autism Spectrum children, TBI and regular adult vision therapy patients, which I call The Berne Method.[®]

I have treated more than 2,000 patients using this method that combines Craniosacral therapy developed by Dr. John Upledger, Continuum Movement developed by Emilie Conrad, and the primitive reflex integration developed by Lena and Thorkild Rasmussen. The results have been excellent.

I have found that using the primitive reflex integration program can be volatile for the patient and must be done with the utmost care and monitoring. Both Continuum and Craniosacral soften the survival response that can occur from implementing the reflexes, and the combination of all three modalities can help the person integrate the reflexes. I do use the Starfish activity that I learned from Lena and Thorkild and also use other movement patterns to integrate the Moro reflex, depending on the severity of birth trauma and/or toxicity exposure in the gestation, birth and bonding period. As for age, I have worked with pregnant mothers near their delivery as well as early in the infant/toddler period. In terms of testing the ATNR, my clinical experience has shown that one can see the reflex in body movement without testing the reflex. I have been able to observe it by applying the 21-point analysis, saccadic testing, and paper and pencil testing.

I share Ms. Goddard’s impression that some optometrists might not be applying some of the primitive reflexes in what both of us deem as the appropriate manner. For example the duck or pigeon walk does not show the Moro reflex. I believe it does show how connected the pathway is from cortex to brainstem, which can be useful in understanding a child’s vision development. However, this can and does happen when one is dealing with a complex system. A similar scenario oc-

curs in clinical optometry: A purist of the 21-point analysis or graphical analysis might well be critical of the optometrist who uses his or her experience to modify either method. I am not familiar with Ms. Goddard’s INPP program and do not use it, so I cannot comment on what she is doing in her own reflex program. I think she brings into light the importance of receiving the proper training when implementing a reflex program. Perhaps we can have a symposium to discuss and share ideas, in the hopes of helping children reach their potential.

Sincerely,
Sam Berne, OD,
4 October 2012

Dear Dr Taub,

I write in response to your invitation to comment on the pre-publication copy of a paper by Peter Blythe and Sally Goddard, as my work is discussed within it. The paper also considers the work of Harry Wachs, Lori Mowbray and Sam Berne. I shall primarily limit my reply to the section relating to my work as I expect the others mentioned will also be responding.

I always test my patients for primitive reflex responses as part of my assessment of the patient’s vision and visual process. The visual process is pervasive in human thought and action. Vision is much more than eyesight, the visual process takes meaning from all sensory input, relates it to previous experience, and then is used to anticipate and direct action. It has been said that the primary purpose of the visual process is the direction of action. It is the observation, probing, testing and assessing of directed action and performance as a view of the visual process, that informs my examination of the patient.

The learning and development of the visual process is intertwined with the development of movement, postural control and perceptual processing skill in the first year of life, and continues thereafter. In 1949 Gesell¹ said that “The intimate interdependence of the visual and action systems is nowhere more significantly displayed than in the sequence and trends of child development.”¹

Hadders Algra’s² *Theory of Motor Development* is based on Edelman’s Neuronal Group Selection Theory³ (NGST) and describes a primary variability of movement patterns, followed by selection, and then a secondary (adapted) variability of movement patterns. The primary repertoire of movement variability begins in utero and is explored by self generated movements, based on the sensory afferent information. With time and practise, and as the child gains voluntary control, selection of movement patterns takes place, which is age related e.g. reaching and grasping selection takes place at about 4 months, selection for sitting at about 6-7 months. Then that is followed by a repertoire of secondary variability of movement patterns as the child practises their selected movement in different situations, e.g., can grasp when sitting, standing, lying, in different directions etc. Selection of movement pat-

terns in the secondary repertoire of movement takes place based on experience. The neurosensory cortical re-entrant pathways provide the reference back to previous experience³ in the visual process that is used in secondary repertoire selection. The mature situation occurs when the child can adapt each movement exactly and efficiently to task specific conditions and tasks.

The primitive reflexes are involved with the primary repertoire of movement variability, and remain available in the brainstem as a movement choice within the motor development hierarchy. Indeed, the Tonic Labyrinthine Reflex (TLR) and Tonic Neck reflexes are used at all times in the unconscious control of posture,⁴ as part of the neural substrate.⁵ Capute⁵ has shown that investigations using electromyography have demonstrated the universal persistence of the primitive reflexes into normal adulthood. Gesell¹ described the role of the tonic neck reflexes in the development and control of eye movement at length. The understanding and treatment of the motoric basis of visual process learning has been part of optometry for over 60 years.

Hadders Algra² said “The NGST advocates that intervention therapies for children with motor dysfunction at an early age should focus on the provision of variable sensorimotor experiences. The latter might be achieved by means of the application of variable postures which counteract the infant’s propensity for stereotyped activity.” This describes the learning of primary movement patterns from the primitive reflexes as part of a motor intervention strategy.

When it comes to making an assessment of primitive reflexes response the appropriate stimulus is used to elicit the reflex, and observation made to probe whether the patient has the cortical learning to have developed a primary and secondary movement repertoire to that stimulus. It questions whether the cortical learning has been made from the primitive reflex to gain voluntary control. If the cortical learning is in place completely then the reflex response will be absent.

Where there has been incomplete cortical learning from the primitive reflex movement development will be affected and is considered a primary course of delay in achieving motor milestones and performing coordinated movements.⁶

Impoverished and incomplete motor learning affects, and is affected by, the learning and development of visual skill, and is apparent in all performance and behaviours, e.g., coordination, school performance, fine hand control, sports skill, thinking, planning, sequencing, eye movement control. Piaget⁷ said that highest visual skills - attention, identification, localisation, apperception, mental synthesis and visualisation - are part of abstract thought. In turn abstraction is a high level experience that is a source for the development of intelligence. It follows that the visually directed cortical learning from the primitive reflexes in the first year of life is fundamental to the development of intelligence.

My assessment of a patient involves testing within my optometric examination room, and the assessment of primitive reflexes and gross motor skill movement patterns in my vision therapy room. There are many methods of testing for primitive reflex responses, e.g., by Fiorentino⁸ and Capute,⁵ not just those recommended by INPP. A lack of learning from the reflexes can be seen in posture, movement and gait when walking on a walking rail; when testing pupil reactions and at other times in the optometric examination of the patient.

A photographic description of the assessments I make for primitive reflexes was shown on the ICBO poster described by Goddard and Blythe as ‘Issue 9’ in their paper. As was pointed out I had a labelling error on my poster, and that has been corrected. But it was just that, a labelling error not an error of thinking. The poster now says, correctly,

Assessment of the Landau reflex response for the underlying Tonic Labyrinthine Reflex (TLR). Also, assessment of body awareness, the ability to follow instructions, balance, and core strength and stability.

The Landau reflex follows on from the Tonic Labyrinthine reflex (TLR), and develops as the child learns extensor control from the TLR. As I stated on my poster, I view the Landau reflex response in terms of learning from the TLR, so that where there has been incomplete learning from the TLR the development of the Landau reflex will be incomplete, and the development of the extensor tone will be poor.⁴

In my practice, testing for any primitive reflex does not take place in isolation, but is viewed as part of the patient’s overall performance, as described above. Goddard⁹ states in her book, *Reflexes, Learning and Behaviour*, that “the Landau reflex acts as an inhibitory influence upon the TLR,” but has neglected to mention that in this paper, preferring to give a lesson on the Strauss reflex which was the reflex mentioned in the labelling error. The Strauss reflex does not play any part of my assessment of the Landau reflex and learning from the TLR.

I have been working in this way for over 12 years including motor developmental learning in my Optometric Vision Therapy (OVT) programme, with excellent success. In order to reach their full potential, patients need to complete a programme of OVT that includes learning from the primitive reflexes, through gaining the ability to move accurately, automatically and gracefully through space with the eyes, body and mind, as they have for over 60 years.

By coincidence, optometrists may now choose to gain a greater appreciation of both the benefits and limitations of the INPP approach of reflex stimulation and inhibition programmes by attending Goddard and Blythe’s newly launched course for behavioural optometrists.

Yours sincerely,
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