

MOTOR OBSERVATIONS



[www. Motorobservations.com](http://www.Motorobservations.com)

February 11, 2011

Zandvoort, Netherlands

A comprehensive instrument
measuring a full range of motor performances

NEW
STANDARDIZED
MOTOR OBSERVATIONS
TEST

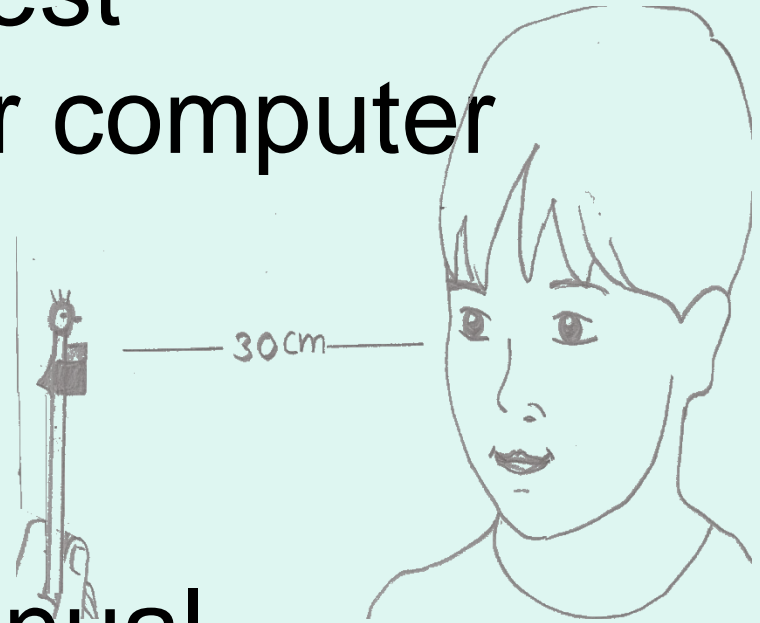
based on Ayres' clinical observations

Standardized Administration
Scoring
Computer Generated Results
Treatment Planning

- The Motor Observations is a standardized 36 item test of clinical observations based on the work of Dr. A. Jean Ayres.

The Motor Observations :

- Statistically based test
- Download from your computer



Has an Illustrated Manual

- 30 to 45 minutes to administer
- 18 minute color training video
- Scoring on a 5 point scale

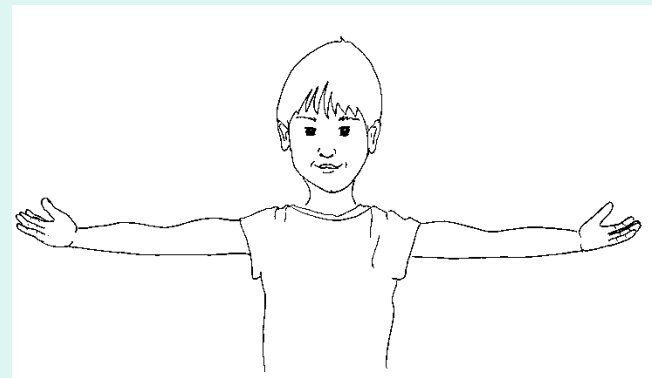
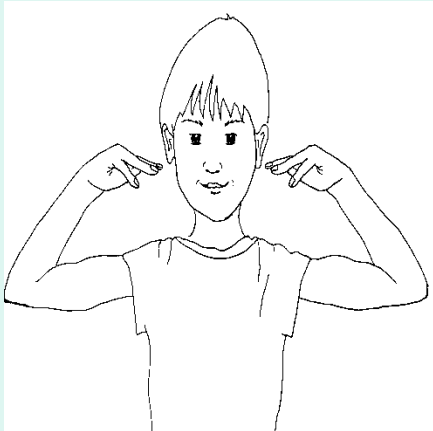
Dr. David Freides, neuropsychologist,
Emory University, published 1980

Blind Evaluation of Body Reflexes
and Motor Skills with Learning
Disability

Double Blind Study

Clinical Observations and other items were calibrated to allow grading on a 5 point scale

11 boys with an average I.Q. (age 9.2) to match group learning disability boys (age 9.8)



Double Blind Study

Five experienced clinicians scored each boy from a video.

Results:

45 of 97 items were reliable and valid.

Boys with learning disabilities were discernable from those without learning disabilities.

Exact Item Development

Smooth Eye Movements

Score:

5. Smooth, uniform following movements.
4. Generally smooth, slight hesitations or irregularities.
3. Irregular, saccadic eye movements during following, or blinking, or red eyes.
2. Generally not able to follow, loses object.
1. Is not sufficiently able to fixate on the object to start the movement.

General Scoring Guidelines

Scores:

5. this is the best score and fulfills all the criteria.
4. the performance is not quite perfect, with a small difficulty.
3. there are clear problems with performance.
2. the child attempts the item but performance is very poor.
1. the child cannot do the item.

Motor Observations' Statistics :

NORMED: Total N=199

The 82 American children met
statistical criteria and thus were able to be
combined with the 117 Dutch children.

Motor Observations

- Normative group n=199
- S.I. Therapy group-Dutch: n=196

Age groups: 5-0 to 5-11

6-0 to 6-11

7-0 to 7-11

8-0 to 11-11 months

For:

- ADHD and ADD,
- Learning Disabled
- Autistic Spectrum,
- Developmentally Delayed children,
- Children with speech and language disorders
- Children with cerebral palsy. etc.



Items can be flexible without effecting the statistics

Flexible

- Extra verbal explanation possible.
- Extra demonstration possible.
- Place child in position if necessary.

Non-flexible

- Required demonstration
- Required trial of item
- No extra's- means:
no extra verbal or physical demonstrations

ANALYSIS TO DETERMINE WHICH ITEMS QUALIFIED FOR THE MOTOR OBSERVATIONS

- Developmental Factors
 - 75%-high scores 5,4
 - ten point spread between youngest and oldest group
- Discriminates between “Normal” and SI Dysfunction group per item $p < .05$
- Inter-rater reliability $r > .70$

- **From 71 items to**

a final 36 items!!!

MOTOR OBSERVATIONS WORK SHEETS

Date of Birth and Age: _____

Date of Evaluation: _____

Name of Examiner: _____

Reason for Referral: _____

ITEMS:

Highest scores

Lowest scores

1. Smooth Eye Movements	-glasses off	5	4	3	2	1
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	-glasses on	5	4	3	2	1
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2. Following Circular Movements	off	5	4	3	2	1
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	on	5	4	3	2	1
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3. Independent Eye Movements	off	5	4	3	2	1
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	on	5	4	3	2	1
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4. Convergence-Left Eye	off	5	4	3	2	1
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	on	5	4	3	2	1
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5. Convergence-Right Eye	off	5	4	3	2	1
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STANDARD DEVIATIONS

- Use of standard deviations ?
to take a large amount of data to make it understandable
- Called “Normal distribution curve or Bell Shaped Curve or Gaussian Curve
- I.Q is on a Bell Curve
- For the Motor Observations : Understanding the results
and demonstrating progress

Bell Curve

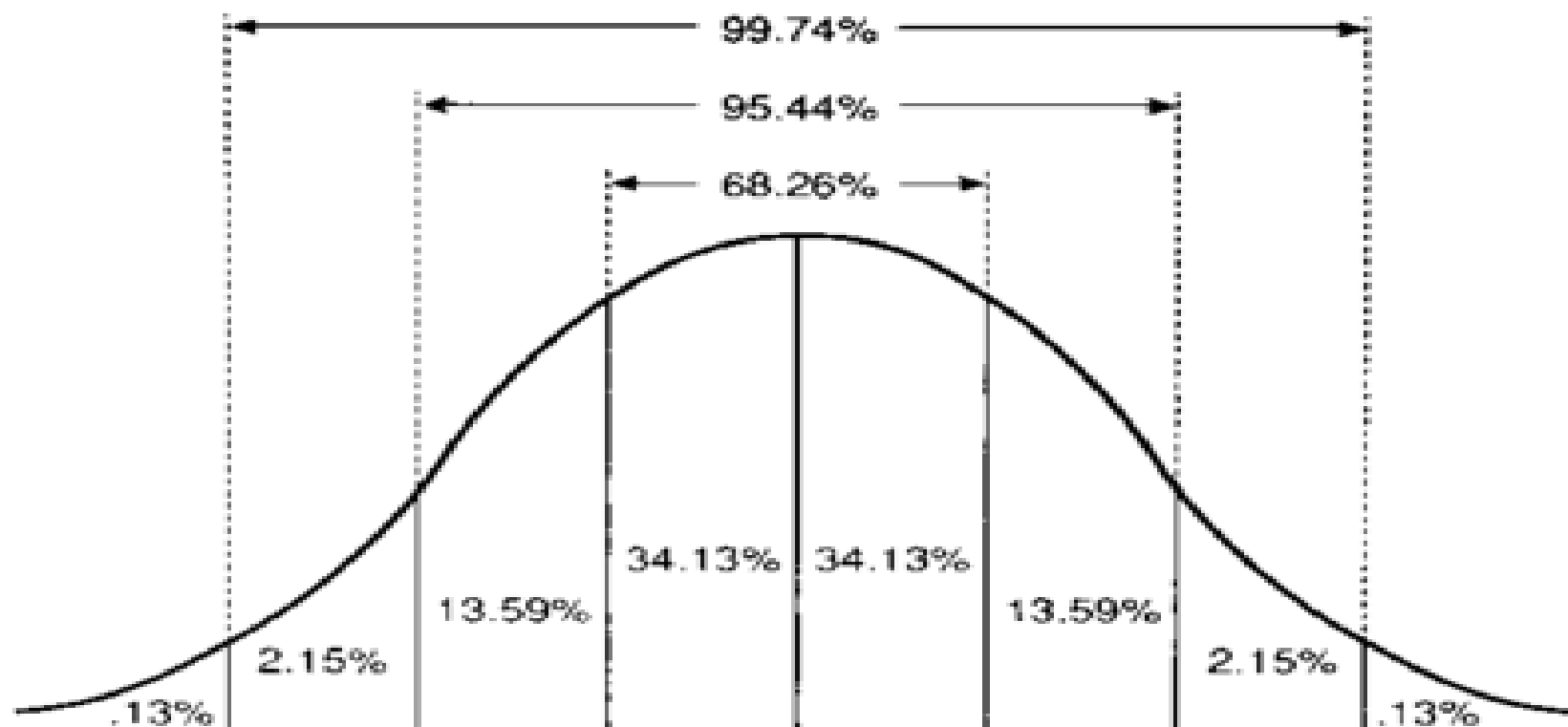
- To find out how a child's score compares to the scores of a group of children, in the same age
- Ex. Height of a child, bigger or smaller compared to a group of children, with the same factors- boys, age 7-8, living in Cozumel, Mexico.
- Place all boy's heights on continuum.
- Find the medium height, give this a value of 0.0.

How do the numbers spread

Using the standard deviation measure, determine what number of the boys fall where on the Bell Curve

very short/ short	Medium	Mean	Medium	tall / very tall		
-3.0	-2.0	-1.0	0.0	+1.0	+2.0	+3.0
	34.1%		34.1%			

Distribution of IQ Scores



Standard
Deviations

-3

-2

-1

0

+1

+2

+3

IQ Scores

55

70

85

100

115

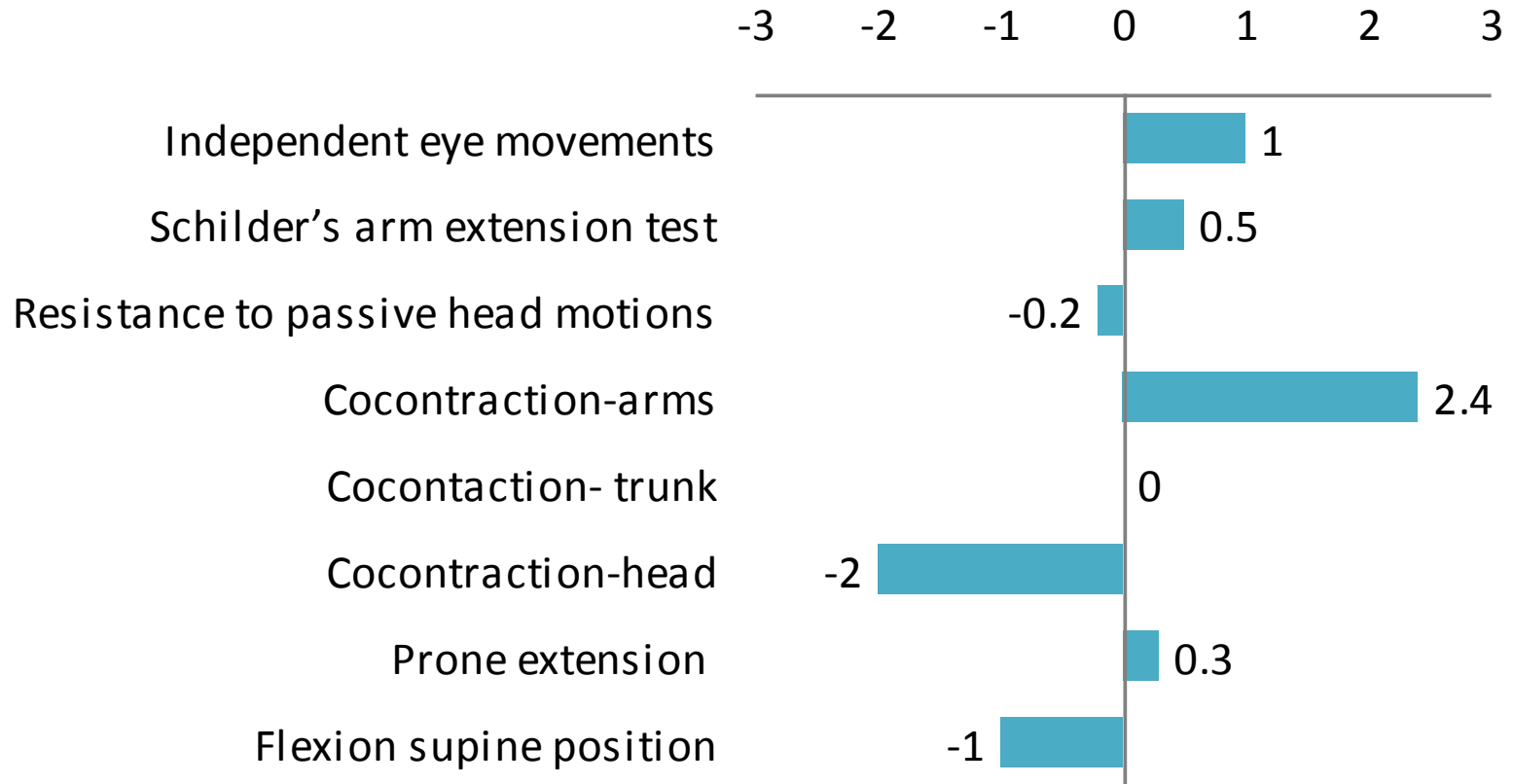
130

145

"SENSE AND NONSENSE ABOUT IQ"

Charles LOCURTO - Ed. Praeger (NY) 1991 - Page 5

Tone/ Stability



■ Tone/Stability average S.D. 0.13

Theoretical Groups

- one factor only, “the motor factor”,
on a varimax rotation

Bernadette v. Schaik, physical therapist and Lynn organized the Theoretical Groupings

Theoretical Groups

- Tone/Stability
- Equilibrium and Gravity Responses
- Rotation
- Slow Movements
- Motor Planning

Theoretical Groups

- Demonstrated significant differences between all ages
- Demonstrated significant differences between the normal and the dysfunctional children

Tone/stability

- Independent eye movements
- Schilder's arm extension test
- Co contraction-arms
- Co contraction- trunk
- Co contraction-head
- Prone extension
- Flexion supine position
- Resistance to passive head motions

- **Equilibrium and Gravity Responses**
- Dynamic tonic neck reaction left
- Dynamic tonic neck reaction-right
- Hopping-left
- Hoping-right
- Heel to toe walking-forward
- Heel to toe walking-backward
- Postural security on the ball

- **Rotation**
- Arm extension during passive head
- movements-portion of Schilder's
- Diadochokinesis-left
- Diadochokinesis-right
- Asymmetrical tonic neck reaction-left
- Asymmetrical tonic neck reaction- right
- Rolling- left
- Rolling -right

- **Smooth movements**
- Smooth eye movements
- Following circular eye movements
- Convergence- left
- Convergence- right
- Smooth movements- arms

- **Motor planning**
- Head turning, with eye fixation
- Motor planning of the mouth
- Throwing
- Catching
- Broad Jump
- Drawing a lazy eight with both hands
- at the same time
- Lazy eight -right
- Lazy eight –left

Pre and Post Testing

1. Quantifies progress
2. A factor, in determining continuation of therapy
3. Suggests areas for future emphasis
4. Demonstrates progress for insurance company re-imburement
5. Provides feedback to client, parent, staff

Extra Information on **Items 1,2**

- Child is not penalized for head movements and corrections on Item 1, 2.
- Head movements are scored on Item # 3-Independent Eye Movements.
- You may observe it and score it-but *what does it mean?*

What does it mean when...

- Item 3
- The child cannot move his eyes independently from his head.....
- Possible overall immaturity
- Possible low muscle tone in trunk, neck
- *****
- Possible torticollis
- Possible stiff neck on day of testing

What does it mean if child cannot do smooth eye pursuits?

Item 1 and 2

- Jerky or saccadic pursuits are *possibly* due to:

poor integration of the cerebellum,
specifically the **fastigial or flocculus
nuclei.**

Smooth pursuits problems

More possibilities:

- Specific CNS disorders
- “Attention problems”
- Visual problems
- Try to determine that it is NOT from poor physical posture.
- Medicine effects pursuits (and PRN scores.)

What does it mean when...

- over- shooting, not finding the target at first?
- It may mean a problem in the cerebellum with comparing the signal to the generator of movement

Problems with Smooth Pursuits

- not being able to stop at the end of the eye movement-**anticipatory behavior-cerebellar** mediated task.
- Understanding the task- being able to put the verbal task into appropriate action-a **motor planning task**.

Convergence –Item 4,5

This is a basic reflex. But the items are cognitive.

- restriction in range of movement
- jerky movements
- lack of symmetry

May all be signs of an ocular motor problem

In “lay” terms-called a “lazy eye.”

6. Head turning, with Eye Fixation

Possible problems:

- Vestibular systems' focus mechanism
- Understanding of the task
- Motor planning component

These are easy to distinguish.

7. Motor Planning of the Mouth

- Due to “true” planning problems caused by **poor proprioceptive** and **tactile** information.
- **Lack of imitation skills** without vision
- **Lack of build up of engrams- patterns**

8. Slow Movements

- Problems with **poor trunk control**
- Problems with **muscle tone**
- Possible problems with **cerebellum**

9.-11. Diadochokineses

- Problems with **muscle tone, arms and trunk**
- Possible problems with **cerebellum** for smooth alternating movements

12. Schilder's Arm Extension Test

- Problems with **total body tone**.
- Problems with **balance** and all the components of it: **proprioception, tone, equilibrium**

13. Arm Extension During Passive Head Turning

- Problems may be due to **extra fixation** to achieve stability.

Or..

- **Lack of stability**
- Check that it is **not tactile defensiveness.**

14. Resistance to Passive Head Motions

- Problems may be due to **extra fixation** to achieve stability.
- Or..
- **Lack of stability**
- Check that it is **not tactile defensiveness**

15. Asymmetrical Tonic Neck Reactions

- Immature central nervous system, which does **not allow differentiation of head from trunk.**
- **Poor proprioceptive** flow of information from **neck receptors to muscles**
- **Poor postural responses** are probably due to **low muscle tone**

17. Dynamic Asymmetrical Tonic Neck Reactions

- Same issues as the ATNR but this is a positions that puts child into **more of a “stress” situation.**
- May be due to **poor rotation in the trunk.**

19. Co contraction- Arms, etc.

- General **poor muscle tone** in upper body and arms.
- Due to **poor proprioceptive/kinesthetic** information flow, **poor muscular reactions**.

22. Prone Extension

- Possibly due to **excessive flexor tone**
- **Poor extensor tone** in total body
- Cannot build extensor tone for stability without **holding breath**

23. Supine Flexion Position

- Probably due to **poor flexion tone**.
- Possible due to some **physical abnormality**.
- Unable to stabilize without **holding breath**.

24. Rolling-Left

- Possible problem with rotation along the trunk.
- Asymmetrical muscle tone on one side of the body.
- Motor planning problems.
- Obvious autonomic reactions

26. Gravitational Security on the Ball

- Problems could be due to poor integration of vestibular/ visual and proprioceptive information.
- Specifically a certain head position or movement could be frightening or nauseating

27. Hopping

- Problems in general with **balance**.
- **Asymmetrical tone** on each side of the body.
- Smooth coordinated movements are due to **cerebellum problems**.

28. Heel to Toe Walking

- Due to poor vestibular/proprioceptive/
visual integration.
- Possible fear issue cause problems.

31. 32. Catching and Throwing

- Problem with **ocular motor processing** and appropriate timing of arms and body – the **muscular response**.
- Problem of a smooth response coordinated by the, **thalamus, superior colliculus, cerebellum**, which can result in **planning problems**

33. Broad Jump

- Possible problems with full range of movement in body. Symmetry.
- Lack of stability following a full movement.
- Possible problem with fear of loss of balance.
- Possible motor planning problem-imitation is needed for the fully coordinated pattern.

34. Drawing a Lazy Eight -two hands

- **Hand dominancy** and problem with coordinating a fine motor pattern across the midline. Possibly shows that the **two cortices** are not working together optimally.
- Problem of holding a **stability pattern on a mobility pattern**.
- Problem of using a **non-dominant hand with a dominant hand simultaneously**.

35. & 36. Drawing a Lazy Eight

- When using the **dominant hand**, problem visually guiding the hand **across the midline, while holding a stable trunk pattern.**
- Problem that the **non-dominant hand** cannot be **“flexible”** in a motoric sense to be able to **perform a new motor task.**