


Sowing Seeds for The Future in Ayres Sensory Integration

Zoe Mailloux, OTD, OTR/L, FAOTA

Baltic-Nordic Sensory Integration Congress

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We have a long and rich history of assessment
occupational therapy
~especially in Ayres Sensory Integration



A. Jean Ayres

With an enduring commitment to scholarship and as a tireless advocate for children, Ayres sought to ensure that the underlying sensory integration factors which interfered with function were understood so that effective treatment was possible



She continually coupled her “clinical questions” with research, resulting in the discovery of factors which laid the building blocks for her theory of sensory integration

Ayres Process

Clinical challenges presented by children

Assessment tools aimed at understanding the problems

Research studies that helped Ayres to see the relationships that helped her to explain sensory integration

Treatment strategies to address the problems

Ayres began
developing
assessment tools
early in her career

The Ayres Space Test

1962

1966

The Southern California
Kinesthesia and Tactile
Perception Tests 1966

Gold Standards for Assessment



Patterns of Perceptual-Motor Dysfunction in Children: A Factor Analytic Study

A. Jean Ayres⁵

First Published April 1, 1965 | Research Article | [View Full Text](#) | [Download PDF](#)

<https://doi.org/10.2466/pms.1965.20.2.335>

[Article information](#) ▾



Abstract

Analysis of test scores made by 100 children with and 50 without suspected perceptual deficits lead to hypothesizing five syndromes characteristic of dysfunction: (a) developmental apraxia, distinguished by deficits in motor planning, tactile perception and finger identification; (b) tactile, kinesthetic and visual perceptual dysfunction in form and position in space; (c) tactile defensiveness, demonstrated by hyperactive-distractible behavior, faulty tactile perception and defensive responses to tactile stimuli; (d) deficit of integration of the two sides of the body, identified by difficulty in right-left discrimination, avoidance in crossing the mid-line, and incoordinate bilateral hand movements; (e) deficit of visual figure-ground discrimination.



Conducting and setting the stage for decades of research, during and after her time, Ayres left us with a deep understanding of the ways in which sensory integration supports

“living life to the fullest”

So...where are we
now?





So many
accomplishments...

Investigators in the FPG Autism Evidence-Based Practice Review Group narrowed down the 60,000 articles on ASD published between 1990 and 2017 to nearly 1,000 that met set standards for methodological quality. Through this review, the team found FIVE new EBP categories, bringing the total to 28.


Evidence-Based Practices for Children, Youth, and Young Adults with Autism

Jessica R. Steinbrenner, Kara Hume, Samuel L. Odom,
Kristi L. Morin, Sallie W. Nowell, Brianne Tomaszewski,
Susan Szendrey, Nancy S. McIntyre,
Şerife Yücesoy-Özkan, & Melissa N. Savage

A National Center for
Autism Evidence & Practice

One of the FIVE:

Sensory integration: interventions (originated by A. Jean Ayres) that target the ability to integrate sensory information from the body and environment in order to respond using organized and adaptive behavior.



But along with
accomplishments,
disparities have continued



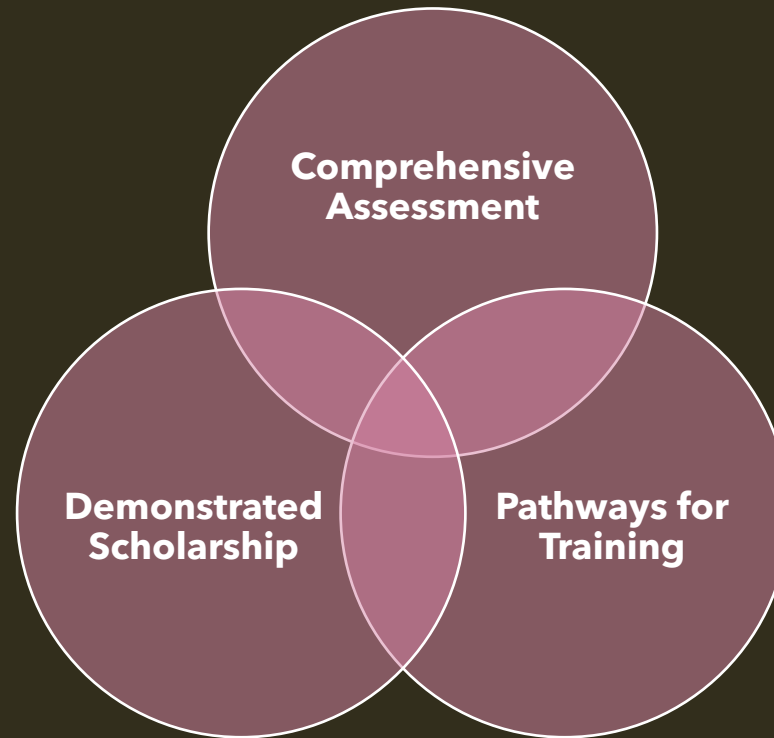
2014:
Initiation of the Ayres Sensory Integration 2020 Vision

Ayres Sensory Integration will have a strong, international presence with demonstrated scholarship, means for valid, comprehensive assessment and pathways for training to ensure the ongoing development, standards of excellence and effective implementation of this important work.





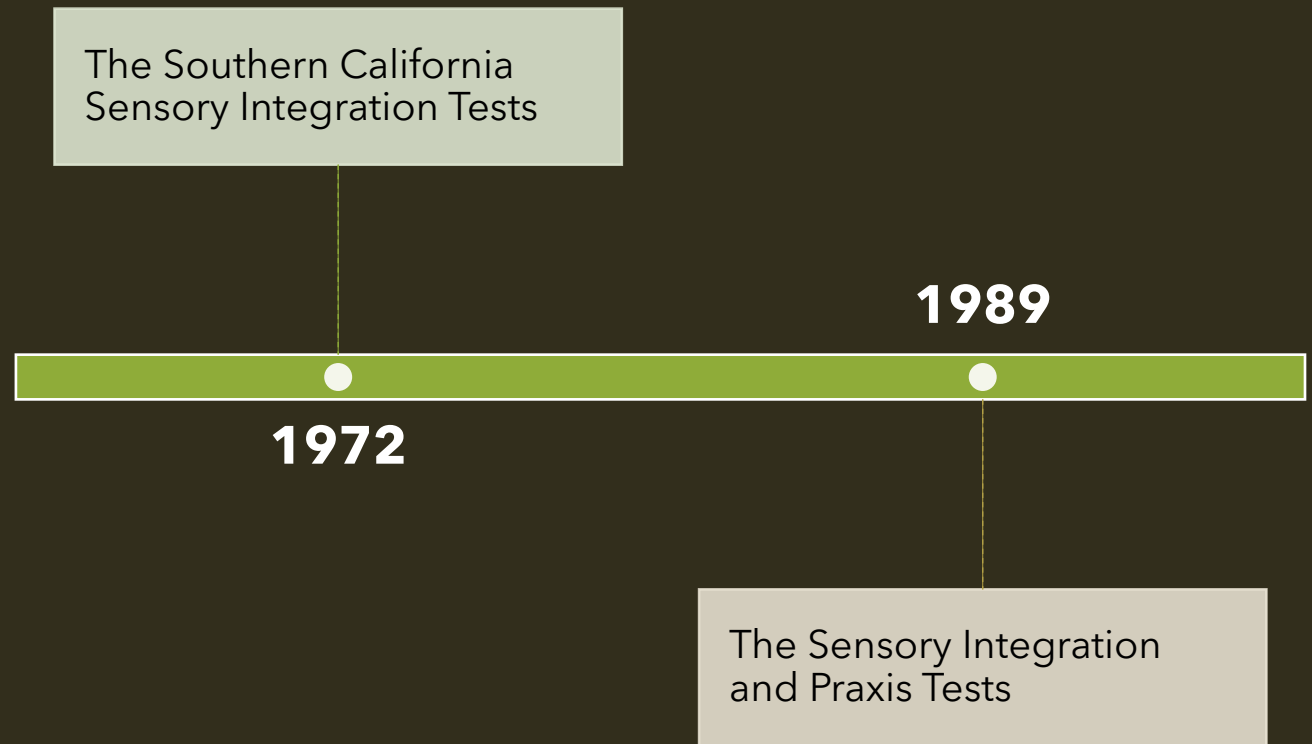
Strong International Presence



Standards of Excellence ~ Effective Implementation

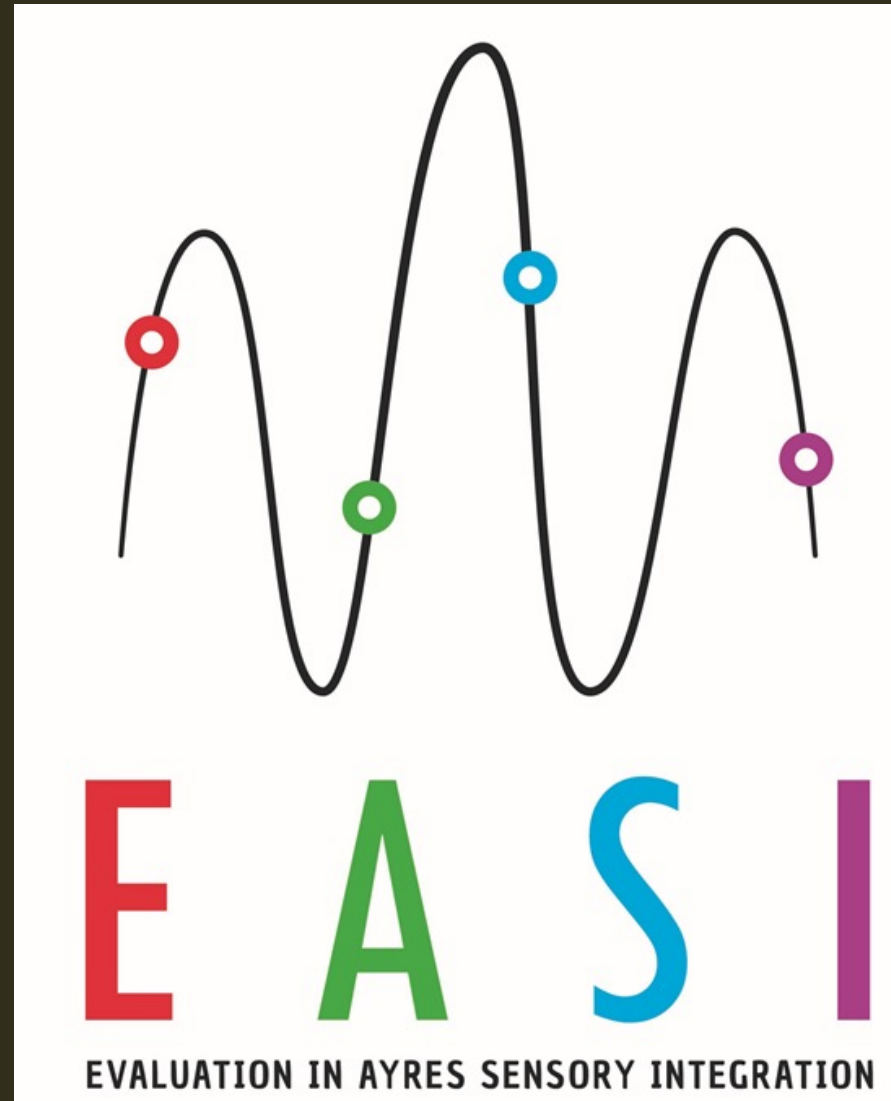


To achieve the goal
of making
comprehensive
assessment
available,
internationally, in
an equitable way...



The EASI

The Evaluation in Ayres Sensory Integration (EASI) is a set of 20 tests designed to measure core sensory integration functions



We designed the EASI to address the functions identified through decades of research

Sensory Perception
Vestibular
Proprioception
Tactile
Visual
Auditory (Localization)

Ocular, Postural, &
Bilateral Integration

Praxis

Hyper and Hypo
Sensory Reactivity

Aims



Assess all the key constructs of ASI



Minimal influence of language, cultural and experiential factors



Low to no-cost access for test sheets, manual and scoring



Strong psychometric properties



Feasible to give in 1 to 1.5 hours



Global representation

ASI Constructs and How They are Tested with the EASI

Sensory Perception

Tactile Perception (TP)

TP: Localization
 TP: Designs
 TP: Shapes
 TP: Oral

Proprioception (Prop)

Prop: Force
 Prop: Joint Position

Vestibular (Vest)

V: Nystagmus

Visual (VP)

VP: Search

Auditory (A)

A: Localization

Praxis

Somatosensory Based

Praxis (Pr):

Pr: Positions
 Pr: Sequences

Ideation Based Praxis (Pr)

Pr: Ideation

Visual Based Praxis (Pr):

VPr: Designs
 VPr: Construction

Language Based Praxis (Pr)

Pr: Following Directions

Ocular

Postural

Bilateral

Ocular (O)

O: Motor & Praxis

Postural Control (PC) & Balance (Bal)

Bilateral Integration (BI)

Sensory Reactivity

HYPER of HYPO

Item Scores:
 ALL Tactile Perception Tests
 GI items on V:N and PC
 Auditory on A:L

Sensory Reactivity Test (SR)

Tactile
 Auditory
 Olfactory
 Gravity & Movement



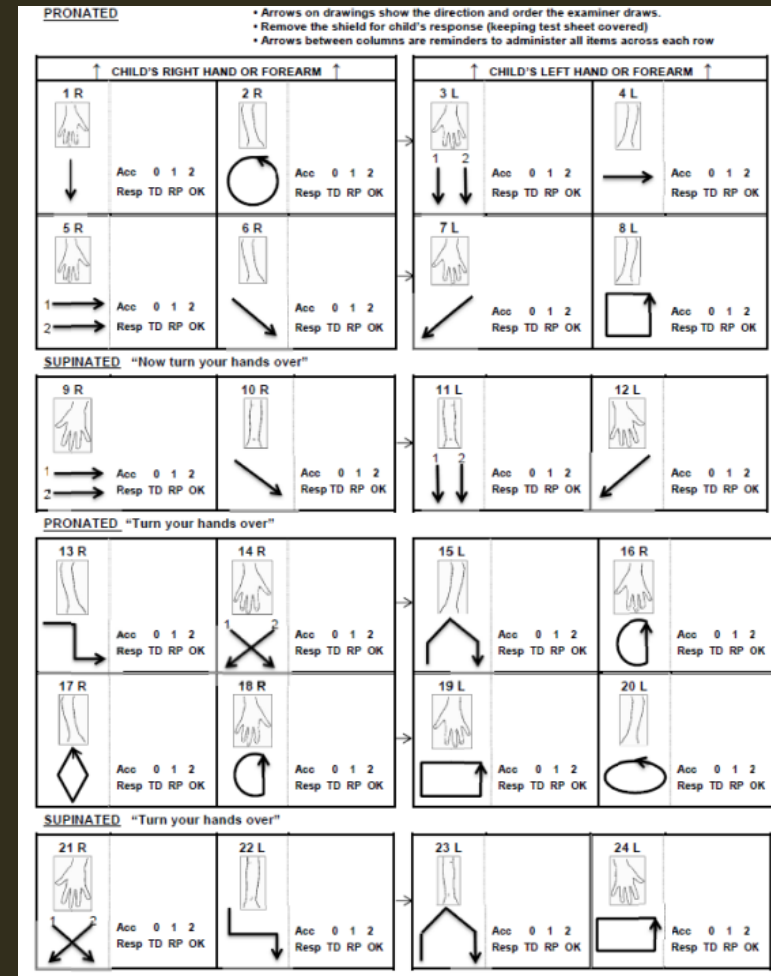
Measures of Sensory Perception

Measures of Tactile Perception

Tactile Perception: Localization

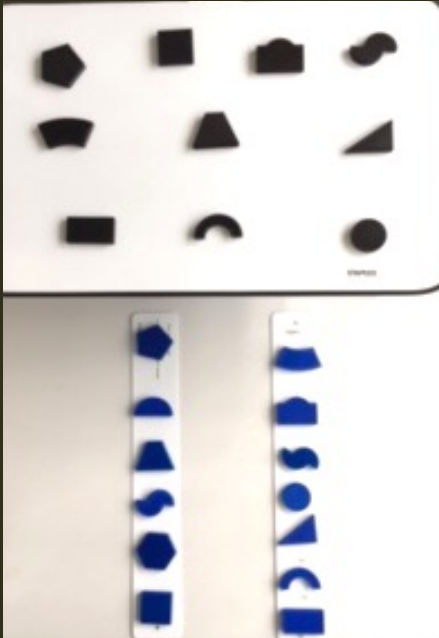


Tactile Perception: Designs

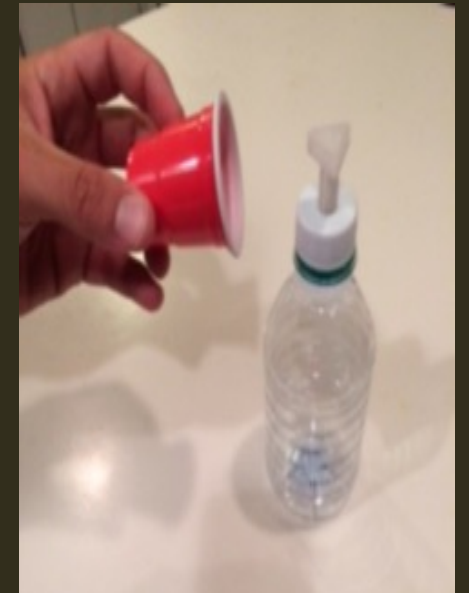
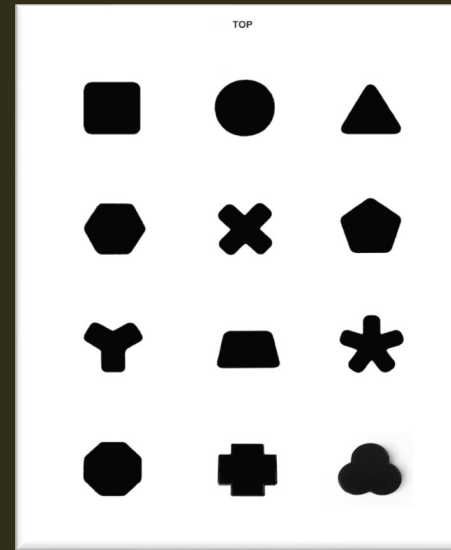


Measures of Tactile Perception

Tactile Perception: Shapes

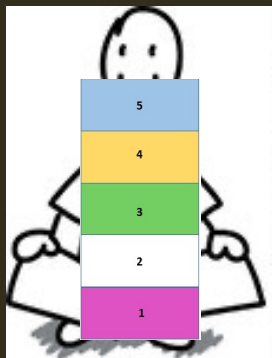
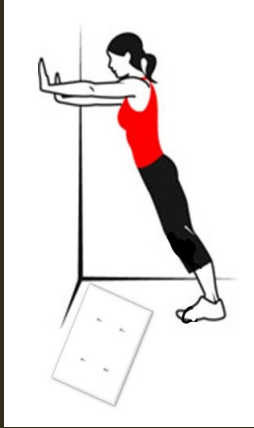
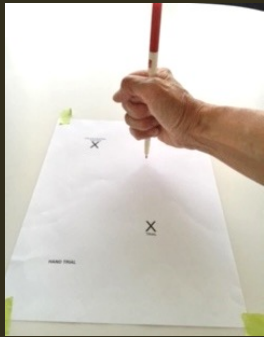


Tactile Perception: Oral



Measures of Proprioception

Proprioception: Joint Position



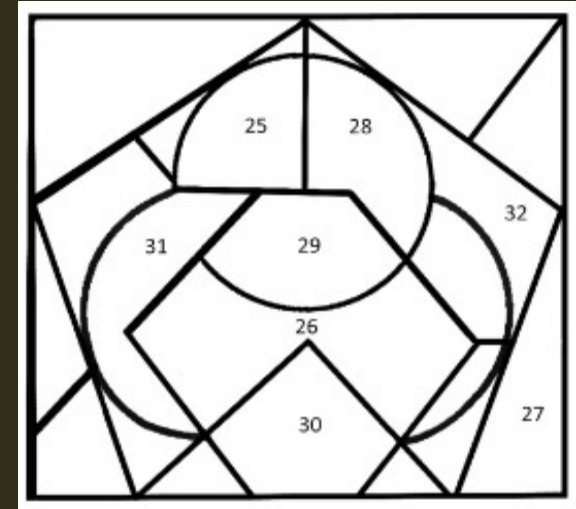
Proprioception: Force



Vestibular Nystagmus



Visual Perception



Auditory: Localization



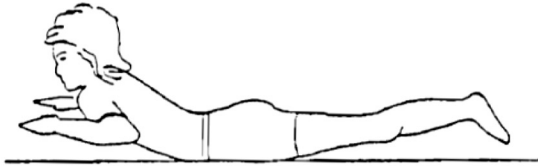
Ocular: Motor & Praxis

TEST ITEMS 1-6		correct direction and to correct position.		
Say, Keep your eyes on the eraser. Don't move your head Move pencil in each motion as shown in the diagram. Move eraser end of pencil to positions 1-3 in a <u>continuous</u> motion (i.e. do NOT stop between items 1-2-3). After item 3 score items 1-3, before going on to item 4. After entering scores for items 1-3, move through positions 4-6 in a <u>continuous</u> motion (again, do NOT stop between items 4-5-6); then score each.		0 Loses visual grasp of eraser at any time, jerky eye movements, does not disassociate head and eye movements or goes to incorrect position or in incorrect direction.		
1. Start 2.5 cm to the side of child's left eye; move up from eye level to top of head		2	1	0
2. Move diagonally down from left side top of head to right side of chin		2	1	0
3. Move horizontally from right side to left side of chin (Score then go on to item 4)		2	1	0
4. Start at right side, top of child's head and move down to right side of chin		2	1	0
5. Move back up from right side of chin to right side, top of head		2	1	0
6. Move diagonally across down to left side of chin		2	1	0



Postural Control

Figure 1
Prone extension posture



(Head, shoulders, arms, lower thighs, knees, and feet off floor)



Balance



Bilateral Integration



Measures of Praxis

Praxis: Positions



Praxis: Sequences

6B. (total actions: 6)

						2:
						1:
						0:

2H. (total actions: 3)

			2:
			1:
			0:

9F. (total actions: 4) - Raise eyebrows 2 times; - Blink both eyes; - Raise eyebrows.	2: Completes 4 actions in correct sequence and in correct positions. 1: Completes 2 or 3 of the actions in correct sequence and in correct positions; OR all 4 actions in correct position, but not in correct sequence. 0: Completes 1 or less of the actions; or adds extra actions.
10F. (total actions: 5) - Make non-voiced sounds P-K-P-T-K.	2: Completes 5 actions to make unvoiced sounds, in correct sequence. 1: Completes only 3 or 4 of the actions in correct sequence and with correct sounds; OR all 5 actions with correct sounds, but not in correct sequence. 0: Completes 2 or less of the actions to make sounds; or adds extra actions.

Measures of Praxis

Praxis: Following Directions

6B.	2
“Put one arm up, one arm down, and one foot back”	1
	0

1H.	2
“Put your thumb on one finger of the other hand”	1
	0
2H.	2
“Make a ball with this piece of paper” (Give the paper to the child)	1
	0

1F.	2
“Open your mouth and cover your teeth with your lips”	1
	0
2F.	2
“Open your eyes really big and close your mouth all the way.”	1
	0

Praxis: Ideation



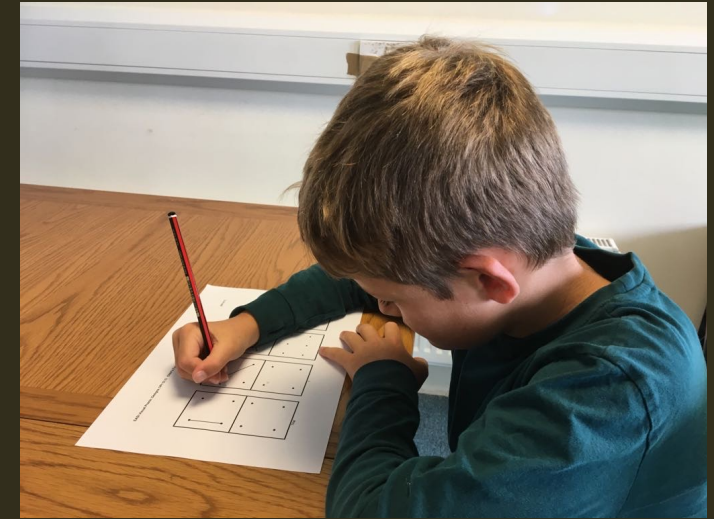
Measures of Praxis

Visual Praxis: Designs

1. EASI Visual Praxis: Designs (VPr:D)® Child's Form (10/10/18)
Print these pages single sided, so designs don't show through from the other side

Trial 1 2

ID# _____ EASI Visual Praxis: Designs (VPr:D)® Research version. Do not duplicate without permission 1
(This line should be 3 cm in length)



7 8 9 10

11 12 13 14

Measures of Praxis

Visual Praxis: Construction



Measures of Sensory Reactivity

Performance Measures

Tactile Sensory Reactivity Scores on the 4 EASI Tactile Tests-Tactile Perception: Localization; Tactile Perception: Designs; Tactile Perception: Shapes; and Tactile Perception: Oral

Gravitational Insecurity Scores on several items of the EASI Postural Control Test

Auditory Reactivity Scores on the EASI Auditory Localization Test

The EASI Sensory Reactivity Test which includes tactile, auditory, olfactory & vestibular





EASI Coordinating Team

Regional Leads

Country Leads

Country Teams

INDC Testers

EASI Authors



Zoe Mailloux, OTD, OTR/L, FAOTA



L. Diane Parham, PhD, OTR/L, FAOTA



Susanne Smith Roley, OTD, OTR/L, FAOTA



This project has kept a focus on the functions needed for satisfying and successful participation-worldwide!

A group of children are gathered around a large sheet of paper, drawing various school-related items. The drawings include a school building with a clock tower, a globe, a backpack, a calculator, a computer monitor, a paint palette, a ruler, a lightbulb, a pencil sharpener, a pair of scissors, a kite, a girl, a boy, a stack of books, a bell, a magnifying glass, and various school supplies. The text is overlaid on the central part of the drawing.

Over 2000 Volunteers
In over 100 Countries
Coming together so that
Children Can be More Fully
Understood...
our unifying theme



Over 4000 children tested to-date.
Data collection to be completed as
soon as pandemic allows



More than 50 countries have already contributed data with many more ready to test children when feasible



The background features a blurred financial dashboard with several data points and line graphs. Visible text includes: 'OMX18 25 INDEX' with values 1172.94 and 0.87%; 'OMX18' with values 10916.69 and 10847.17; 'OMX18GI' with values 984.13 and 0.87%; 'INDEX' with values 57.3180, 6025.9680, and 5993.7030; 'OMX18' with values 599.40 and 28289.06; and 'OMX18' with values 1632.51 and -0.30%. The text 'Preliminary Data Analysis' is overlaid in white on a dark blue background.

Preliminary Data Analysis



Patricia Grady Dominguez
Analyzing EASI data for PhD
(under direction of Dr. Anita
Bundy at CSU)

&

Dennis Dominguez
Computer Programmer
developing EASI Scoring
Program

RASCH ANALYSIS OF THE EVALUATION IN AYRES SENSORY INTEGRATION: A Global Effort to Establish Evidence for Validity and Reliability



E A S I
EVALUATION IN AYRES SENSORY INTEGRATION

1.

SI impacts
every
occupation

2.

Scientific
progress in
SI relies on
assessment

3.

Thousands
of children
receive SI-
based OT
every day

This work will touch
countless lives across
the world.



Low

Average

High

-3

-2

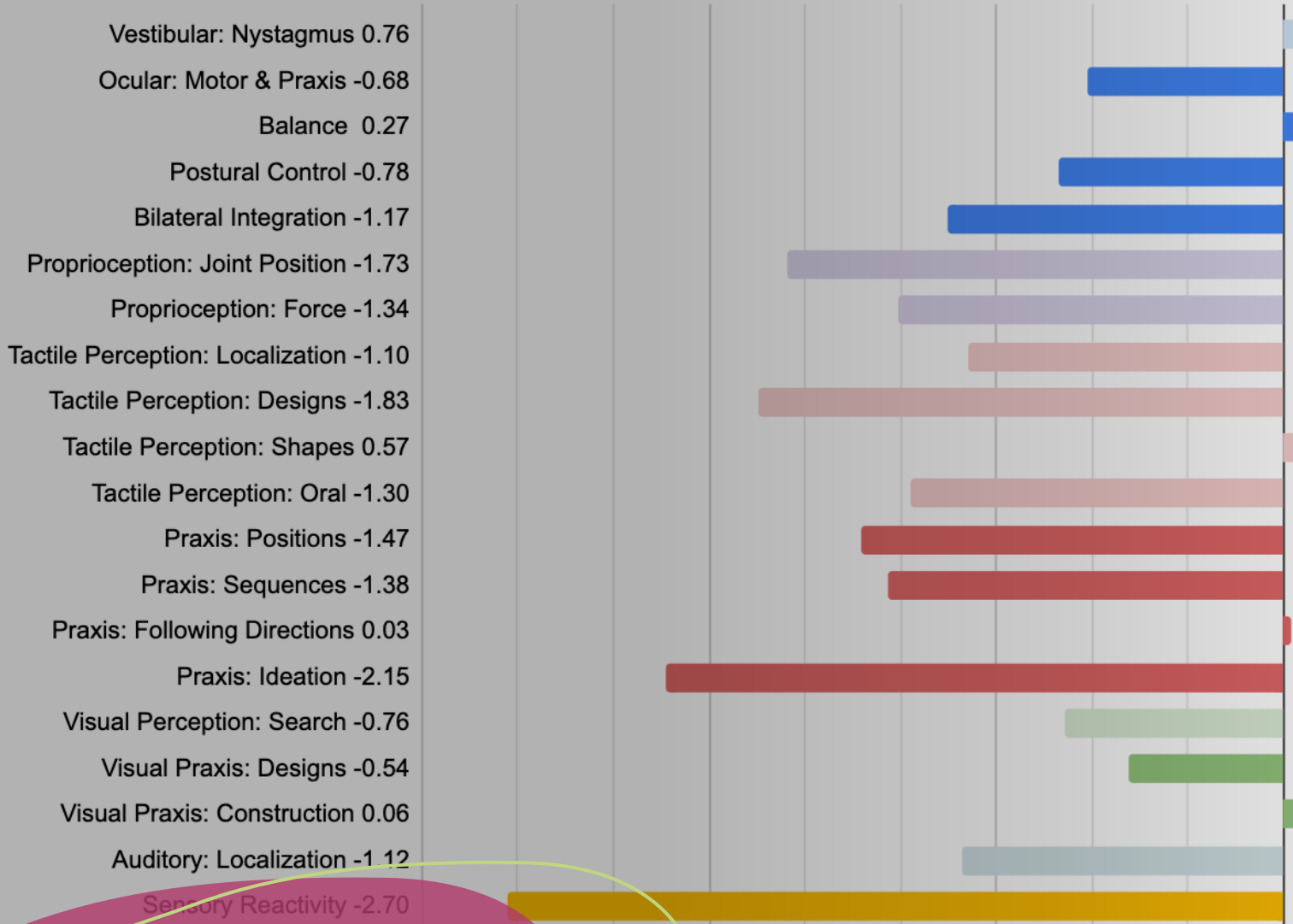
-1

0

1

2

3



We hope to have first edition of the EASI Scoring Program (ESP) SOON!

The Psychometrics Centre

Cambridge Judge Business School

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Collaboration

Services

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Concerto platform for the development of online adaptive

We are happy to be partnered with Concerto to offer the ESP- with options for Computer Adaptive Testing & Artificial Intelligence for Scoring in the future

THE OPEN-SOURCE ONLINE
ADAPTIVE TESTING PLATFORM

Computer-Adaptive Testing Made Easy



We will need to rely
on research-to-date
for interpretation of
scores...

...That is, until everyone
contributes to our future
knowledge!

cop·y·right
'kăpē, rīt/
noun

1.

the exclusive legal right, given to an originator or an assignee to print, publish, perform, film, or record literary, artistic, or musical material, and to authorize others to do the same.



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Author

- Author: Zoe Mailloux
Author Created: text
Work made for hire: No
Citizen of: United States
Domiciled in: United States
- Author: J. Diane Pacharn
Author Created: text
Citizen of: United States
Domiciled in: United States
- Author: Suzanne Smith Roley
Author Created: text
Citizen of: United States
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three papers published; two
more accepted for
publication; many in process



When we have comprehensive assessment data,
we can plan and implement more effective and meaningful intervention...



...and when children are more fully understood, they and everyone around them, will be more comfortable, happy, and successful.

We know that ASI will continue to enrich lives worldwide and we can't wait to see the ways in which you ALL will contribute!



Maybe you can join us?

ISIC 2022
CALIFORNIA

SENSORY NEURAL FOUNDATIONS
FOR SOCIAL CONNECTION



Register
TODAY

Join in-person or virtually

July 14 - 16, 2022

Redondo Beach, California



Thank you

zoemailloux@gmail.com