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INTELLECTUAL DISABILITY

PRACTICAL TRAINING

NeuCare Diploma
www.neucare.eu

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OBJECTIVES OF THE TRAINING:

- Conceptualize the neuropsychological assessment in children and adolescents with intellectual disability.
- Becoming familiar with the use of the WISC-V to assess children and adolescents with intellectual disability.
- Description of a case report of intellectual disability: Correction and interpretation of WISC-V scores (primary indexes and full scale IQ).



Contents

1. DEFINITION AND DIAGNOSIS OF INTELLECTUAL DISABILITY (ID)

2. NEUROPSYCHOLOGICAL ASSESSMENT IN INTELLECTUAL DISABILITY

2.1. Cognitive assessment

2.2. Adaptive behavior assessment

3. NEUROPSYCHOLOGICAL ASSESSMENT IN INTELLECTUAL DISABILITY: BATTERIES AND TEST

4. INTRODUCTION TO WISC-V

5. CASE REPORT: LAURA



1. DEFINITION AND DIAGNOSIS OF INTELLECTUAL DISABILITY (ID)



Intelligence is the general mental capacity that involves reasoning, planning, solving problems, thinking abstractly, comprehending complex ideas, learning efficiently and learning from experience (AAIDD, 2010).

INTELLECTUAL DISABILITY (ID):

It is a **neurodevelopmental disorder** characterized by 3 features:

- Deficits in cognition.
- Deficits in adaptive behavior.
- Onset during the developmental period (childhood or adolescence).

Classifications of Intellectual Disability

- International Classification of Diseases (ICD-10) (WHO, 1992).
- Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (APA, 2013)
- American Association on Intellectual Developmental Disabilities (AAIDD, 2010)
- The International Classification of Functioning, Disability, and Health (ICF) (WHO, 2001).



DSM-5 (APA, 2013). DIAGNOSTIC CRITERIA OF INTELLECTUAL DISABILITY

- **Criterion A.** Deficits in **intellectual functions** (reasoning, problem solving, planning, abstract thinking, judgment, academic learning, and learning from experience, confirmed by both clinical assessment and individualized, standardized intelligence testing).

IQ scores are normally distributed with a mean of 100 and a standard deviation of 15. IQ scores approximately two standard deviations below the mean (i.e., $IQ < 70$) can indicate significant deficits in intellectual functioning. The measurement error of most IQ tests is approximately 5 points; consequently, **IQ scores between 65 and 75** are recommended as cut-offs in determining intellectual deficits.

- **Criterion B.** Deficits in **adaptive functioning** that result in failure to meet developmental and sociocultural standards for personal independence and social responsibility. Without ongoing support, the adaptive deficits limit functioning in one or more activities of daily life, such as communication, social participation, and independent living, across multiple environments, such as home, school, work, and community.

The Diagnostic and Statistical Manual of Mental Disorders identifies **three domains of adaptive functioning** (Criterion B): conceptual, social, and practical. To be diagnosed with ID, individuals must show impairment in at least one domain. Usually, children with ID experience problems in multiple areas:

The conceptual (academic) domain involves competence in memory, language, reading, writing, math reasoning, acquisition of practical knowledge, problem solving, and judgment in novel situations, among others.

The social domain involves awareness of others' thoughts, feelings, and experiences; empathy; interpersonal communication skills; friendship abilities; and social judgment, among others.

The practical domain involves learning and self-management across life settings, including personal care, job responsibilities, money management, recreation, self-management of behaviour, and school and work task organization, among others.

In DSM-5, **individuals with intellectual disability are characterized by the presence in significant deficits in both intellectual functioning (criterion A) and adaptive behaviour (criterion B).**

- **Criterion C.** Onset of intellectual and adaptive deficits during the developmental period (childhood or adolescence).

Classification of Intellectual Disability severity according to DSM-5

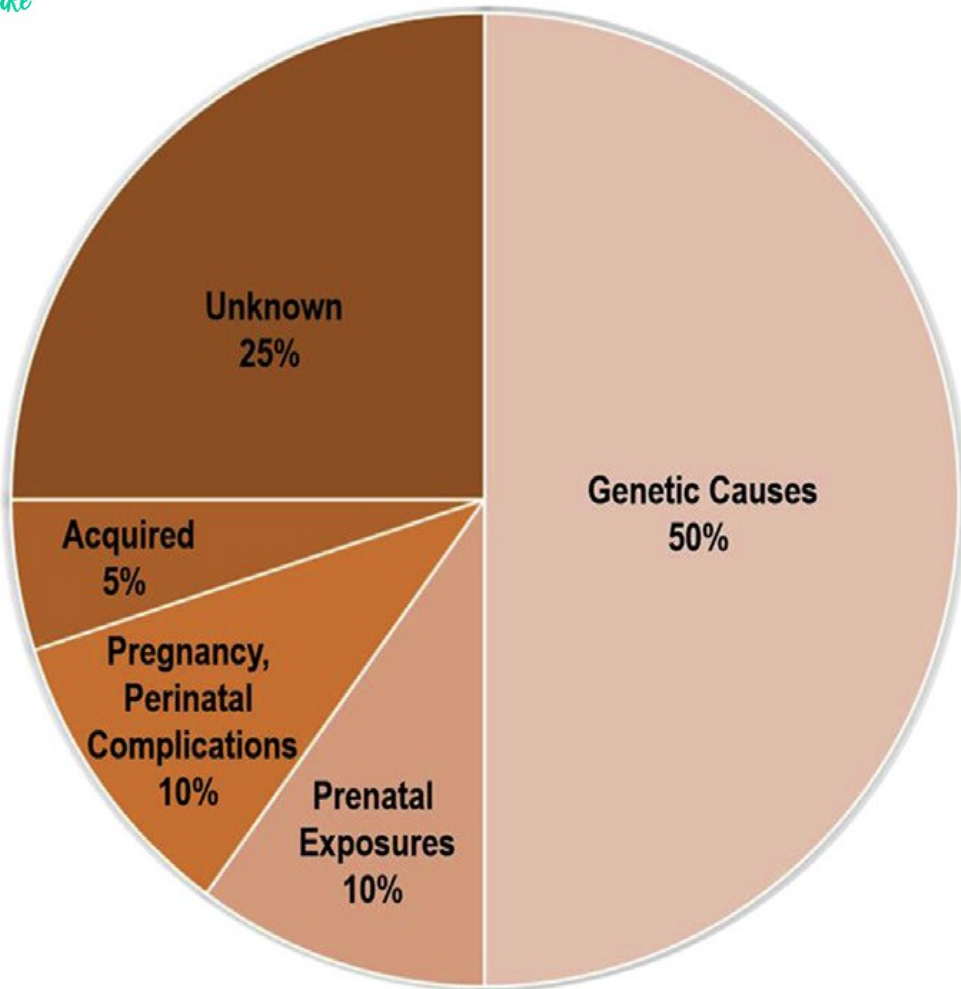
Adapted from: Boat, T.F. & Wu, J.T. (2015)

Severity category	Approximate percent distribution of cases by severity	DSM-5 Criteria (severity classified on the basis of daily skills)
Mild	85%	Can live independently with minimum levels of support.
Moderate	10%	Independent living may be achieved with moderate levels of support, such as those available in group homes.
Severe	3.5%	Requires daily assistance with self-care activities and safety supervision.
Profound	1.5%	Requires 24-hour care.

ETIOLOGY AND PREVALENCE RATE



Causes of ID and their respective percentages



Genetic Testing	
Tier 1	Chromosomal Microarray (CMA) Fragile X genetic testing Karyotype (suspected Down or other chromosomal syndrome) 1 st tier metabolic testing *carnitine profile *amino acids *urine organic acids, *glycosaminoglycans *oligosaccharides *purines *pyrimidines *GAA/creatine metabolites.
Tier 2	X-Linked ID panel & X-CMA (men with suggestive family history) MECP2 study (women) 2 nd tier metabolic testing – based on symptom profile
Tier 3	Whole-exome sequencing

Prevalence between 1% and 3%. Males are more likely than females to be diagnosed with ID (male/female ratio: 1.6/1). The majority of ID diagnoses takes place between 4 and 7 years old.



2. NEUROPSYCHOLOGICAL ASSESSMENT IN INTELLECTUAL DISABILITY



- Two main approaches:

1. Comparing individual test scores to **normative data** that approximates as closely as possible the **general population** (e.g., ID vs. General population) (AIM: DIAGNOSIS) (Strauss et al., 2006).
2. Comparing individual test scores to **normative data** that matches as closely as possible **the group to which the examinee belongs** (e.g., ID vs. ID) (AIM: characterize cognitive strengths and weaknesses) (Strauss et al., 2006).

➤ **Neuropsychological impairment:** Cutoffs between ≥ 1 and ≥ 2 SD below de mean (Eglit, 2019).



IMPORTANT ASPECTS TO CONSIDER IN THE ASSESSMENT of ID:

- Availability of cultural adapted and validated neuropsychological tests.
- When assessing an individual with a known syndrome, review literature for the most up-to-date information on cognitive profiles/behavioural phenotypes (British Psychological Society, 2015).

Factors that can impact on cognitive functioning/test performance

A number of factors may influence an individual's cognitive function and their performance on neuropsychological tests. Moreover, psychologist must address them in considering which test to use. These factors include (British Psychological Society, 2015):

- Motivation and effort
- Fatigue
- Epilepsy
- Medication/use of drugs
- Head injury
- Physical and mental health
- Motor/sensory impairments
- Culture/diversity

❑ A typical assessment in Neuropsychology involves the administration of a multitude of cognitive and behavioral tasks.

❑ Integration of quantitative and qualitative data.



EXAMPLE: Working memory task

Task: Examiner presents visual items where quantity of items is gradually increased.

Examinee 1: recalls 10 images. Makes mistakes and correct answers in an alternate way

Examinee 2: recalls 10 images. Makes mistakes in the first 5 images and correctly recalls the 5 last images.

Same scores but different performance: examinee 1 has impairments in attention and examinee 2 presents impairments in working memory.

❑ Neuroimaging also provides relevant information and represents another essential research method in Neuropsychology.



2. NEUROPSYCHOLOGICAL ASSESSMENT IN INTELLECTUAL DISABILITY

2.1. Core domains of neuropsychological cognitive assessment in ID:

- Attention
- Memory
- Executive functions
- Language

Varied etiology of ID: There is no a strong body of knowledge about impaired cognitive profiles of cognitive functions.

2.2 Adaptive behavior assessment

- Typically, reports of adaptive skills are given by caregivers. However, it can be helpful to obtain information regarding adaptive functioning from multiple sources, including employers, job coaches, teachers, and, in some cases, the individual being assessed, in order to generate a wide-ranging assessment of strengths and weaknesses (Cervantes, Shalev & Donnelly, 2019).



3. NEUROPSYCHOLOGICAL ASSESSMENT IN INTELLECTUAL DISABILITY: BATTERIES AND TESTS

INTELLECTUAL FUNCTIONING ASSESSMENT

Early childhood assessment	Ages
- Bayley Scales of Infant and Toddler Development-Third Edition (Bayley-3)	1-42 months of age
School aged assessment	
- Wechsler Intelligence Scale for Children-5th Edition (WISC-V)	6-16 years old
Measures with minimal verbal requirement	
- Leiter International Performance Scale-Third Edition (LEITER-3)	+ 3 years old
- The Test of Nonverbal Intelligence- Fourth Edition (TONI-4)	+ 6 years old
- Comprehension Test of Nonverbal Intelligence-Second Edition (TONI-2)	+ 5 years old

ASSESSMENT OF ADAPTIVE SKILLS

The Adaptive Behavior Assessment System- Third Edition (ABAS-3)	Ages
- Parent and teacher forms	0-21 years old
- Adult form (self report)	Individuals over 16 years old

NEUROPSYCHOLOGICAL TOOLS

GENERAL BATTERIES	AGES
- NEPSY-II	From 3 to 16 years and 11 months old
SPECIFIC MEASURES	
Learning and memory	
- Rey Complex Figure	4-15 years old; adults
- Test of Memory and Learning (TOMAL)	5-19 years old
- Benton Visual Retention Test (BVRT)	From 8 years old
Processing speed	
- Symbol search subtest of WISC-V	6-16 years old
Sustained attention	
- Children's Color Trail Test (CCTT)	8-16 years old
- Digits subtest WISC-V	6-16 years old
- Corsi Block-Tapping Test	Children, adolescents and adults
Selective attention (sustained + inhibitory control)	
- Conners Continuous Performance Test (CPT-II)	+ 6 years old
- Perception of Differences Test (FACES)	6-18 years old
Alternating attention	
- Trail Making Test B (TMT-B)	+ 5 years old
Language	
- Peabody Picture Vocabulary Test (PPVT-III)	+ 2.5 years old
- Illinois Test of Psycholinguistic Abilities (ITPA-3)	3-10 years old
EXECUTIVE FUNCTIONS (EF)	
Multiple EF	
- Behavior Rating Inventory of Executive Function (BRIEF-P)	From 2 to 5 years and 11 months old
- BRIEF-2	5-18 years old
Working memory	
- Digit span, Picture Span, digit span backwards (subtest WISC-V)	6-16 years old
- Letter-number sequencing (subtest WISC-V)	6-16 years old
Verbal inhibition	
- Stroop task "day-night"	3-7 years old
- Stroop task "dogs and cats"	+7 years old
- Stroop task "finger-hand"	+ 7 years old
Motor inhibition	
- Go no Go	+ 3 years old
Verbal fluency	
- Semantic: words that belongs to a established category (e.g., things that we can eat or drink)	+ 7 years old
- Phonological: words that begin with "p"	+ 7 years old
Cognitive flexibility	
- Wisconsin Card Sorting Test (WCST)	+ 6.5 years old
Planification	
- London Tower	+ 7 years old
Decision taking	
- Iowa Gambling Test (IGT)	+ 9 years old

4. INTRODUCTION TO WISC-V





Full Scale

**Verbal
Comprehension**

Similarities ✓

Vocabulary ✓

Information

Comprehension

**Visual
Spatial**

Block Design ✓

Visual Puzzles

**Fluid
Reasoning**

Matrix Reasoning ✓

Figure Weights ✓

Picture Concepts

Arithmetic

**Working
Memory**

Digit Span ✓

Picture Span

Letter-Number
Sequencing

**Processing
Speed**

Coding ✓

Symbol Search

Cancellation

✓ Full Scale IQ (FSIQ):

- Most reliable score – good predictor of important life outcomes.
- Derived from a sum of 7 subtest scaled scores.
- Considered the score that is most representative of global intellectual functioning (g).
- Traditionally, FSIQ has been the first score to be considered in profile interpretation.



Primary Index Scales

**Verbal
Comprehension**

Similarities

Vocabulary

**Visual
Spatial**

Block Design

Visual Puzzles

**Fluid
Reasoning**

Matrix Reasoning

Figure Weights

**Working
Memory**

Digit Span

Picture Span

**Processing
Speed**

Coding

Symbol Search

The primary index scores, along with the FSIQ, are recommended for a comprehensive description and evaluation of intellectual ability.

VERBAL COMPREHENSION INDEX

- It is a measure of the child's ability to access and apply acquired word knowledge.
- The application of this knowledge involves verbal concept formation, reasoning and expression

Word knowledge acquisition

Information retrieval

Ability to reason and solve verbal problems

Communication of knowledge

VISUAL-SPATIAL INDEX

Measures the child's ability to evaluate visual details and to understand visual spatial relationships to construct geometric designs from a model

Visual spatial reasoning

Integration and synthesis of part-whole relationships

Attentiveness to visual detail

Visual-motor integration

WORKING MEMORY INDEX

Measures the child's ability to register, maintain, and manipulate visual and auditory information in conscious awareness.

Registration requires attention, auditory and visual discrimination, and concentration.

Maintenance is the process by which information is kept active in conscious awareness, using the phonological loop or visual sketchpad (see Baddeley, 2012).

Manipulation is mental resequencing of information based on the application of a specific rule.

Attention	Concentration	Mental Control	Visual and Auditory	
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PROCESSING SPEED INDEX

Measures the child's speed and accuracy of visual identification, decision making and decision implementation.

Involves the child quickly and correctly scanning of discriminating between simple visual information

Short term visual memory	Visual-motor coordination	Visual discrimination	Visual scanning	Concentration	Cognitive flexibility	Rate of test-taking
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FLUID REASONING INDEX

Measures the child's ability to detect the underlying conceptual relationship among visual objects and to use reasoning to identify and apply rules.

Inductive and
quantitative
reasoning

Broad visual
intelligence

Simultaneous
processing

Abstract thinking



ESCALA DE INTELIGENCIA DE WECHSLER PARA NIÑOS-V

ANNOTATION SHEET

Nombre del niño: _____

Examinador: _____

Cálculo de la edad cronológica

	Año	Mes	Día
Fecha de aplicación	<input type="text"/>	<input type="text"/>	<input type="text"/>
Fecha de nacimiento	<input type="text"/>	<input type="text"/>	<input type="text"/>
Edad cronológica	<input type="text"/>	<input type="text"/>	<input type="text"/>



Full Scale IQ (FSIQ)

Total Raw Score to Scaled Score Conversion

Prueba	PD	Puntuación escalada				
Block design	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Similarities	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Matrix reasoning	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Digit Span	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Coding	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Vocabulary	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Figure weights	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Puzles visuales	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	()
Span de dibujos	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	()
Búsqueda de símbolos	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	()
Información	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	()
Letras y números	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	()
Cancelación	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	()
Comprensión	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	()
Aritmética	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	()
Suma puntuaciones escaladas		<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Scaled scores profile

	verbal			pacial		fluido			de trabajo			procesamiento			
	S	V	I	CO	C	PV	M	B	A	D	SD	LN	CL	BS	CA
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1

Profile of composed scores

	ICV	IVE	IRF	IMT	IVP	CIT
160						
155						
150						
145						
140						
135						
130						
125						
120						
115						
110						
105						
100						
95						
90						
85						
80						
75						
70						
65						
60						
55						
50						
45						
40						

Conversion of sum of scaled scores to composed scores

Escala	Suma punt. escaladas	Puntuación compuesta	Rango percentil	Intervalo de confianza 90% o 95%
Verbal Comprehension	<input type="text"/>	ICV <input type="text"/>	<input type="text"/>	<input type="text"/>
Visual spatial	<input type="text"/>	IVE <input type="text"/>	<input type="text"/>	<input type="text"/>
Fluid reasoning	<input type="text"/>	IRF <input type="text"/>	<input type="text"/>	<input type="text"/>
Working memory	<input type="text"/>	IMT <input type="text"/>	<input type="text"/>	<input type="text"/>
Processing speed	<input type="text"/>	IVP <input type="text"/>	<input type="text"/>	<input type="text"/>
Total Scale	<input type="text"/>	CIT <input type="text"/>	<input type="text"/>	<input type="text"/>



Start



	Diseño	Presentación	Cubos necesarios
6-7	1. Niño Examinador	Modelo e imagen	4
	2. Examinador	Modelo e imagen	8
8-16	3. Niño Examinador	Modelo e imagen	8



Reverse



If an examinee to obtain a perfect score on either of the first two items administered, the preceding items should be administered in reverse order until a perfect score on two consecutive items is obtained.



Discontinue



These rules typically require that a certain number of consecutive zero-point responses be obtained prior to discontinuing the subtest. Discontinue points are easily found in the Record Form at the beginning of each subtest.

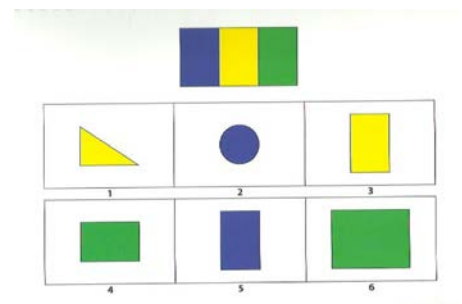
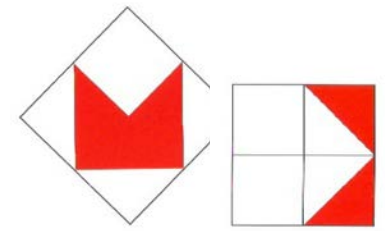


**Verbal
Comprehension**
Similarities
Vocabulary

**Visual
Spatial**
Block Design
Visual Puzzles

Subtest	Description
2. Similarities	The examinee is required to describe how two words that represent common objects or concepts are similar.
6. Vocabulary	The examinee is required to name pictures or provide definitions for words.

Subtest	Description
1. Block Design	The examinee is required to replicate a set of modeled and/or printed two dimensional geometric patterns using red-and-white blocks within a specified time limit.
8. Visual Puzzles	The examinee is required to select three response options that combine to recreate a completed puzzle within a specified time limit.



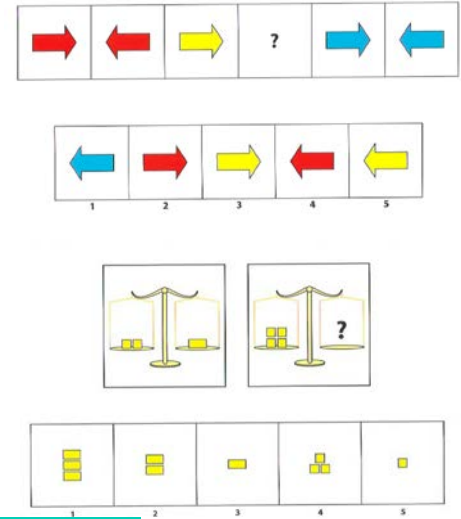


Fluid Reasoning
Matrix Reasoning
Figure Weights

Working Memory
Digit Span
Picture Span

Subtest Description

- 3. Matrix Reasoning** The examinee is required to complete the missing portion of a picture matrix or series by selecting one of five response options.
- 7. Figure Weights** The examinee is required to select a response option that will keep a scale with missing weights balanced within a specified time limit.



Subtest Description

- 4. Digit Span** On Digit Span Forward, the examinee is required to repeat numbers verbatim as stated by the examiner. On Digit Span Backward, the examinee is required to repeat numbers in the reverse order as stated by the examiner. On Digit Span Sequencing, the examinee is required to repeat numbers in ascending order as stated by the examiner.
- 9. Picture Span** The examinee is shown one or more pictures on a stimulus page and then required to select those pictures (in sequential order if possible) from a response page.





Processing Speed
Coding
Symbol Search

Subtest	Description
5. Coding	The examinee is required to copy symbols that are paired with either geometric shapes or numbers using a key within a specified time limit.
10. Symbol Search	The examinee is required to scan a search group and indicate the presence or absence of a target symbol(s) within a specified time limit.

- Administration Time:
 - Primary Subtests: 56 – 67 minutes
 - FSIQ Subtests: 41 - 49 minutes



CAUTION

- Record **everything** the child says and does.
- A **common error** is to establish a basal, but not to give full credit for all items below the basal when calculating the total raw score for that subtest. When multiple issues of establishing a basal are encountered, this may be a sign that the test may not be the appropriate instrument for the individual.

3. Matrices

Comienzo		Retorno		Terminación		Puntuación		
Edad 6-8: ítems de ejemplo A y B e ítem 1. Edad 9-11: ítems de ejemplo A y B e ítem 5. Edad 12-16: ítems de ejemplo A y B e ítem 9.		Si se obtiene 0 puntos en uno de los dos primeros ítems aplicados, aplicar los ítems anteriores en orden inverso hasta obtener dos respuestas perfectas (máxima puntuación) consecutivas.		Después de 3 puntuaciones de 0 consecutivas.		0 o 1 punto. Las respuestas correctas están en color.		
Ítem	Respuesta	Puntuación	Ítem	Respuesta	Puntuación	Ítem	Respuesta	Puntuación
6-16	Ej. A 1 2 3 4 5		11.	1 2 3 4 5 0	1	23.	1 2 3 4 5 0 1	
	Ej. B 1 2 3 4 5		12.	1 2 3 4 5 0	1	24.	1 2 3 4 5 0 1	
6-8	1. 1 2 3 4 5 0	1	13.	1 2 3 4 5 0	1	25.	1 2 3 4 5 0 1	
	2. 1 2 3 4 5 0	1	14.	1 2 3 4 5 0	1	26.	1 2 3 4 5 0 1	
	3. 1 2 3 4 5 0	1	15.	1 2 3 4 5 0	1	27.	1 2 3 4 5 0 1	
	4. 1 2 3 4 5 0	1	16.	1 2 3 4 5 0	1	28.	1 2 3 4 5 0 1	
9-11	5. 1 2 3 4 5 0	1	17.	1 2 3 4 5 0	1	29.	1 2 3 4 5 0 1	
	6. 1 2 3 4 5 0	1	18.	1 2 3 4 5 0	1	30.	1 2 3 4 5 0 1	
	7. 1 2 3 4 5 0	1	19.	1 2 3 4 5 0	1	31.	1 2 3 4 5 0 1	
	8. 1 2 3 4 5 0	1	20.	1 2 3 4 5 0	1	32.	1 2 3 4 5 0 1	
12-16	9. 1 2 3 4 5 0	1	21.	1 2 3 4 5 0	1			
	10. 1 2 3 4 5 0	1	22.	1 2 3 4 5 0	1			

Puntuación directa Matrices (Máximo = 32) ~~8~~ 12

PRACTICE 1

Block design



WISC-V

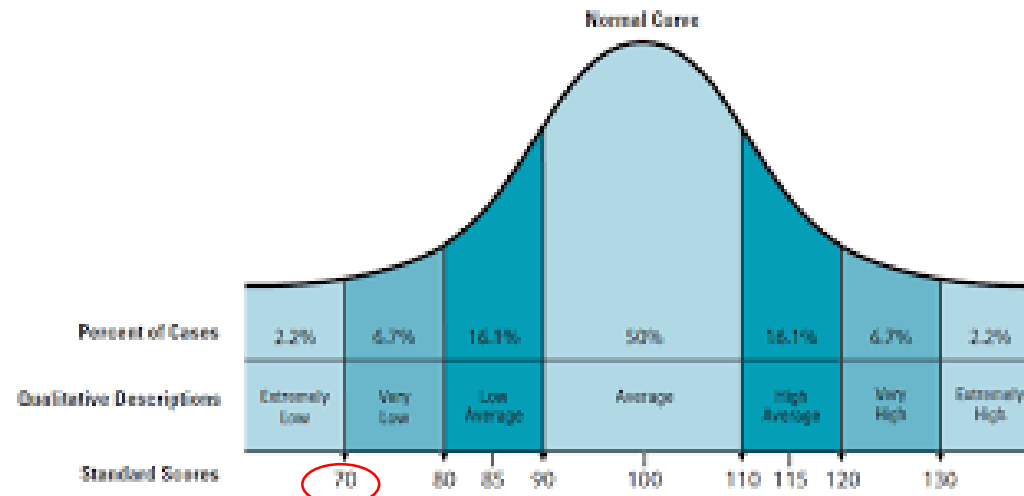
for

Intellectual Disability

Table 1.8. Summary of Special Group Studies With the WISC-V for Primary Index Scales and FSIQ

Source: Adapted from *WISC-V Technical and Interpretive Manual* (Wechsler, 2014b) and reformatted by Sattler, Dumont, and Coalson in *Assessment of Children: WISC-V and WPPSI-IV* (2016), with permission of Jerome M. Sattler, Publisher, Inc.

Special Group	Primary Index Scale												
	Verbal Comprehension Index			Visual Spatial Index		Fluid Reasoning Index		Working Memory Index		Processing Speed Index		FSIQ	
	N	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Mild Intellectual Disability	74	66.0	10.9	66.0	9.9	67.0	11.0	65.1	10.5	71.6	16.2	60.9	8.9
Moderate Intellectual Disability	37	55.2	11.3	56.8	9.6	58.6	12.0	58.3	10.6	59.3	15.8	49.7	8.9



- **For an individual suspected of intellectual disability or low cognitive ability, the examiner may administer any subtest starting with the first item, regardless of the recommended age-based start point.** This is an acceptable practice and helps reduce the likelihood of encountering the awkwardness of administering items in reverse order until a basal is established. However, there is no merit in starting below the suggested start point unless an intellectual disability or low cognitive ability is suspected or for another clinical relevant reason.
- To give the examinee more practice or to have him or her receive more success (or other such reasoning) on easy items is not helpful as there is generally sufficient practice in the instructions of the subtest to ensure the examinee understands the task. Starting early on each subtest lengthens the entire test which introduces an unintended variable into the test: extended testing time. It is recommended that examiners begin subtests at the recommended start point unless there is a good clinical reason to deviate from this general rule.



5. CASE REPORT: LAURA

DESCRIPTION OF THE CASE REPORT: LAURA

Laura is a 8 years and 4 months old girl who was referred for a neuropsychological assessment because she had difficulties at school as well as daily life.

Family history: She has a sister and she is the youngest. Both, mother (39 years old) and father (41 years old) are healthy.

Personal history: The pregnancy was good and the mother did not have any significant problems. Breastfeeding until 8 months old.

Psychomotor development: social smile at 1 month old; sitting at 10 months old. She walked without help at 21 months old. First bisyllable at 2 years old. Use of comprehensible words at 4 years old.

Early intervention services assessed Laura when she was 3 years old and stated that she had a global developmental delay. When Laura was 3 years and 6 months old she was assessed by a pediatric neurologist who did not observe any significant impairment. Genetic tests were negative.

Nowadays, she has difficulties when running and she falls down frequently. She does not speak fluently. Parents tell that she understands better than she speaks although it seems that she does not pay attention. She needs help and supervision in her daily life activities such as shower and eating. She attends school and needs some extra-supports. In general, academic learning is below the expected although reading and writing are in a good track development. She has difficulties with maths. She is integrated in class although it is necessary to direct her attention constantly.

Neuropsychological tests administered

- Orientation Subtest (personal, temporal and spatial).
- Pathways and Interference Subtest (ENFEN), Neuropsychological Evaluation of Executive Functions in Children (Portellano et al., 2011).
- Visomotor Auditive Attention (NEPSY-II), Child Neuropsychological Battery (Korkman et al., 2014).
- **WISC-V. Primary Index Scales (Wechsler, 2015).**
- TAMV-I. Verbal learning and memory test for children (Rivera et al., 2017; Arango-Lasprilla scale, 2017).
- Rey's Complex Figure Test (Rey, 1941; Osterrieth, 1944; Arango-Lasprilla scale, 2017).
- Copy of simple figures.
- Language sub-items of PROLEC, PROLEXIA and PROESC (Cuetos).
- Instruction Comprehension Subtest (NEPSY-II), Child Neuropsychological Battery (Korkman et al., 2014).
- Verbal Fluency Subtest (NEPSY-II), Child Neuropsychological Battery (Korkman et al., 2014).
- Vismotor Precision Subtest (NEPSY-II), Child Neuropsychological Battery (Korkman et al., 2014).
- Fingertip Tapping Subtest (NEPSY-II), Child Neuropsychological Battery (Korkman et al., 2014).
- ABAS-II. Adaptive Behavior Assessment System (Harrison and Oakland, 2008; Spanish adaptation of Montero and Fernández-Pinto, 2013).



Primary Index Scales

**Verbal
Comprehension**

Similarities

Vocabulary

**Visual
Spatial**

Block Design

Visual Puzzles

**Fluid
Reasoning**

Matrix Reasoning

Figure Weights

**Working
Memory**

Digit Span

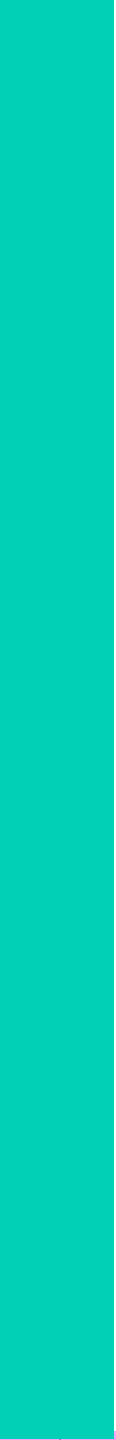
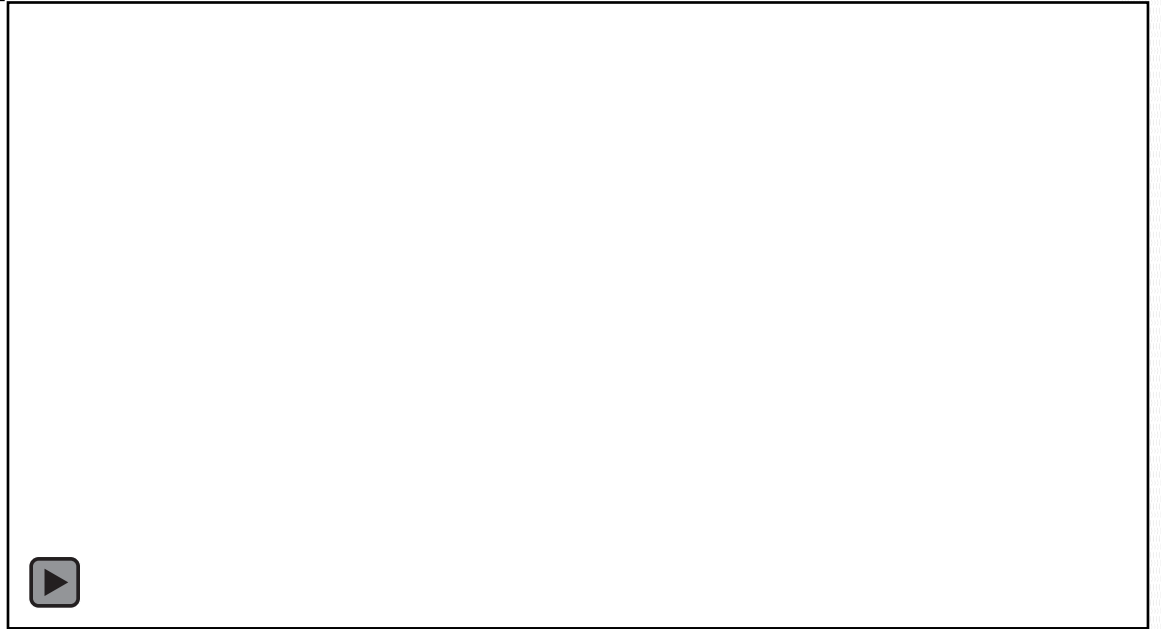
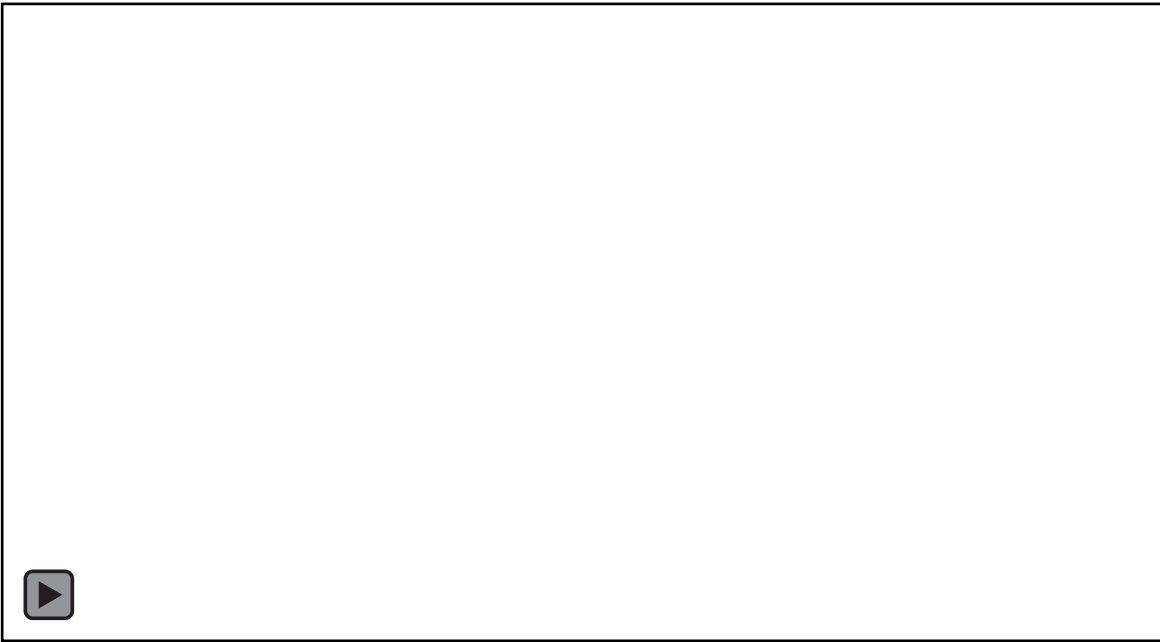
Picture Span

**Processing
Speed**

Coding

Symbol Search

The primary index scores, along with the FSIQ, are recommended for a comprehensive description and evaluation of intellectual ability.



- She is not able to replicate the geometrical pattern.
- As we can see, she presents visual-spatial and visual-constructive difficulties.
- Block design requires:
 - Attention.
 - Visual perception.
 - Component analysis of blocks and their spatial orientation.
 - Performance control (planification, working memory, solving problems)

PRACTICE 2

Calculate Composite Score

Subtest		Scaled Score					
Block Design	5		3				3
Similarities	8	4					4
Matrix Reasoning	3			2			2
Digit Span	10				4		4
Coding	16					4	4
Vocabulary	6	2					2
Figure Weights	9			5			5
Visual Puzzles	5		4				()
Picture Span	7				3		()
Symbol Search	11					5	()
Sum of Scaled Scores		6					24
		Verbal Comp.	Visual Spatial	Fluid Reas.	Work. Mem.	Proc. Speed	Full Scale

Tabla A.2. Conversión suma de puntuaciones escalares a ICV

Sum of Scaled Scores	Composite Score	Percentil Rank	Confidence Interval	
			90%	95%
2	45	< 0.1	44-58	42-60
3	50	< 0.1	48-63	47-64
4	55	0.1	53-67	51-69
5	59	0.3	56-71	55-72
6	62	1	59-73	58-75
7	65	1	62-76	60-78
8	68	2	64-79	63-80
9	70	2	66-81	65-82

Escala	Sum of Scaled Scores	Composite Score	Percentil Rank	Confidence Interval 90% - 95%
Verbal Comprehension	6	ICV 62	1	58-75

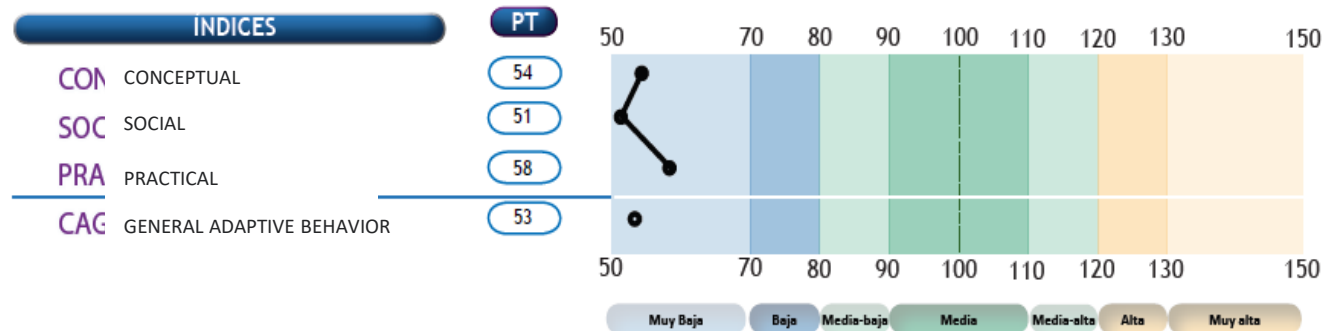
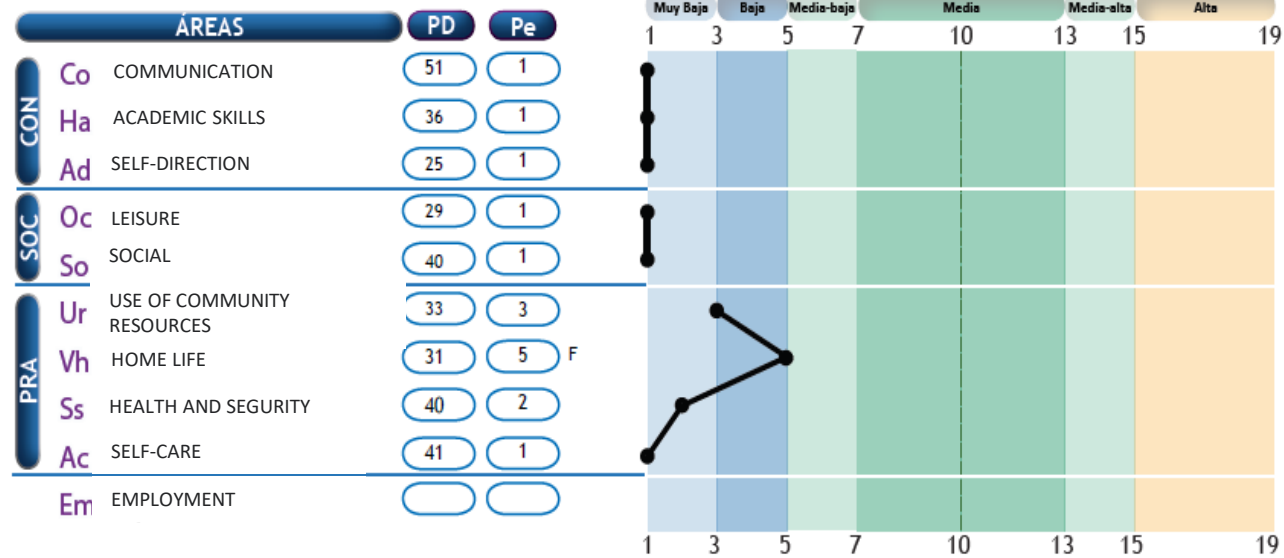


Sum of Scaled Scores	6	7	7	7	6	24
	Verbal Comp.	Visual Spatial	Fluid Reas.	Work. Mem.	Proc. Speed	Full Scale

Escola	Sum of Scaled Scores	Composite Score	Percentil Rank	Confidence Interval
				90 % o 95 %
Verbal Comprehension	6	ICV 62	1	58-75
Visual spatial	7	IVE 64	1	59-76
Fluid Reasoning	7	IRF 64	1	59-74
Working memory	7	IMT 65	1	60-76
Processing speed	9	IVP 69	2	64-82
Total Scale	24	CIT 56	0,2	52-64

ABAS-II

SCHOOL-PARENTS



Nota Pe: Puntuación escalar con media = 10 y desviación típica = 3.
 Nota PT: Puntuación típica con media = 100 y desviación típica = 15.

F: Punto fuerte significativo.

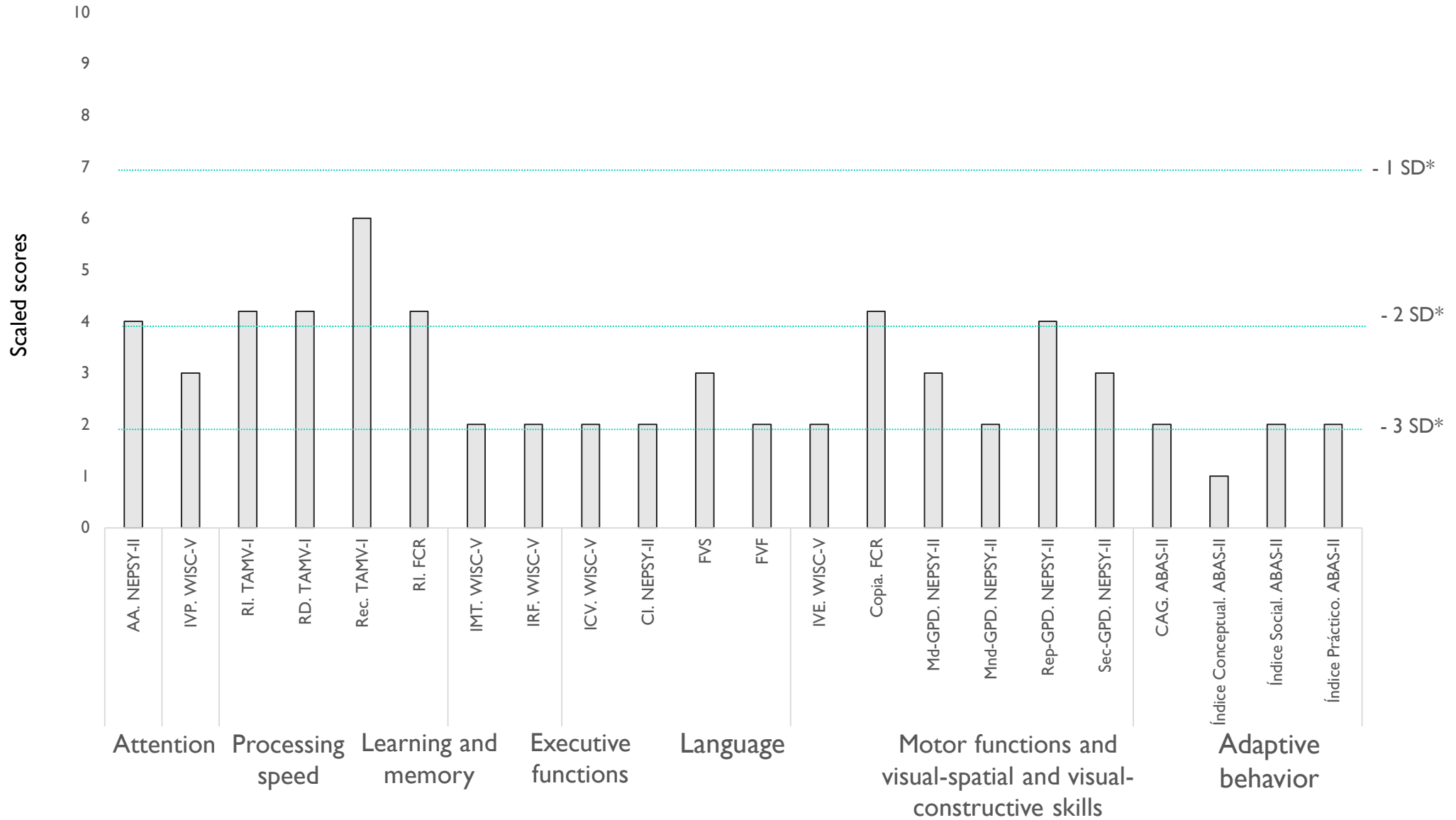
Results

Cognitive functions	Test		Direct Score	Standardized Score (IQ/De/Ss)*
General Index	FSIQ.WISC-V		24	IQ: 56
	General Adaptive Behavior (CAG).ABAS-II		-	Ss: 2
Attention	Pathways. ENFEN	S1	6	De: 1
		S2	4	De 1
	Auditory attention. NEPSY-II	Total	-	Ss: 4
		Correct	20	-
		Commission	6	-
		Omission	10	-
Processing Speed	Coding.WISC-V		16	Ss: 4
	Symbol Search.WISC-V		11	Ss: 5
Learning memory	Verbal. TAMV-I	Immediate recall	19	Ss: <5
		Delayed recall	4	Ss: <5
		Recognition	10	Ss: 6
	Visual. FCR	Immediate recall	4	Ss: <5
Executive functions	Working memory. Digit Span.WISC-V		10	Ss: 4
	Working memory. Picture Span.WISC-V		7	Ss: 3
	Reasoning. Matrix Reasoning.WISC-V		3	Ss: 2
	Reasoning. Figure Weights.WISC-V		9	Ss: 5
	Inhibition. Interference. ENFEN		12	De: 1

Cognitive functions	Test		Direct Score	Standardized Score	
Language	Similarities.WISC-V		8	Ss: 4	
	Vocabulary.WISC-V		6	Ss: 2	
	Instruction Comprehension. NEPSY-II		12	Ss: 2	
	Semantic verbal fluency. NEPSY-II		12	Ss: 3	
	Phonological verbal fluency. NEPSY-II		0	Ss: 2	
Motor functions and visual- and visual-constructive	Block design.WISC-V		5	Ss: 3	
	Visual puzzles.WISC-V		5	Ss: 4	
	Copy. FCR		11	Ss: <5	
	Fingertip tapping. NEPSY-II	Dominant hand		18+22	Ss: 3
		Non-dominant hand		25+33	Ss: 2
		Repetitions		18+25	Ss: 4
		Sequences		22+33	Ss: 3
	Adaptive behavior	Conceptual index.ABAS-II		-	Ss: 1
- Communication area		51	Ss: 1		
- Academic skills area		36	Ss: 1		
- Self-direction area		25	Ss: 1		
Social index.ABAS-II		-	Ss: 1		
- Leisure area		29	Ss: 1		
- Social area		40	Ss: 1		
Practical index.ABAS-II		-	Ss: 2		
- Community resources area		33	Ss: 3		
- Home life area		31	Ss: 5		
- Health and safety area		40	Ss: 2		
- Self-care area		41	Ss: 1		

*IQ: Intelligence quotient (mean 100, Sd 15, Ss: Scaled score (mean 10, Sd 3; De: Decatype (mean 5,5, Sd 2).

Results



*SD: Standard Deviations below the mean

Conclusions

Neuropsychological deficits:

- ❑ General Intellectual Ability: low score (WISC-V; FSIQ = 56)
- ❑ Impairments in selective and sustained attention. Slow at processing information and it affects to verbal learning.
- ❑ General impairment in executive functions (working memory, reasoning and inhibition).
- ❑ Language: difficulties at expressive language, comprehension and verbal fluency.
- ❑ General difficulties in adaptive skills , specially practical adaptive skills.
- ❑ Strengths: verbal memory and working memory

Bibliography

American Association on Intellectual Developmental Disabilities (AAID). Intellectual disability: Definition, classification and systems of supports. Washington, DC: Author; 2010.

American Psychiatric Association. The diagnostic and statistical manual of mental disorders (5th ed.). Washington DC: Author; 2013.

Boat, T.F. & Wu, J.T. (2015). *Mental disorders and disabilities among low-income children*. Washington: The National Academy Press.

British Psychological Society (2015). Guidance on neuropsychological testing with individuals who have intellectual disabilities. Retrieved from <https://www.bps.org.uk/sites/bps.org.uk/files/Member%20Networks/Faculties/Intellectual%20Disabilities/Guidance%20on%20Neuropsychological%20Testing%20with%20Individuals%20who%20have%20Intellectual%20Disabilities.pdf>

Cervantes P, Shalev R, Donnelly L. Definition and diagnosis. In J.L. Matson, editor. Handbook of intellectual disabilities. Integrating theory, research and practice. Switzerland: Springer; 2019.

Echevarría-Ramírez L, Tirapu-Ustárróz J. Exploración neuropsicológica en niños con discapacidad intelectual. Rev Neurol 2021; 73: 66-76.

Eglit GML. Neuropsychology. In J.L. Matson, editor. Handbook of intellectual disabilities. Integrating theory, research and practice (pp. 461-481). Switzerland: Springer; 2019.

Marrus N, Hall L. Intellectual disability and language disorder. *Child Adolesc Psychiatr Clin N Am*. 2017; 26: 539-54.

Matson, J.L. (2019). Handbook of intellectual disabilities. Integrating theory, research and practice. Switzerland: Springer; 2019.

Wechsler, D. (2014). Wechsler Intelligence Scale for Children, Fifth Edition. Pearson



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