

Intelligence and Development Scales-2 (IDS-2) for children and adolescents with visual impairments

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- ⇒ Background
- ⇒ Intelligence and Development Scales-2 (IDS-2)
- ⇒ From IDS-2 to IDS-2-bs
- ⇒ Discussion and Outlook

Background

- ⇒ Intelligence testing and assessing the developmental status of children and adolescents with visual impairments (VI) are of great importance
- ⇒ The **perceptual approach to the world and developmental pathways differ** between children and adolescents with and without VI
- ⇒ Thus, for a fair test, **accessible test materials** as well as **group specific norms** are required
- ⇒ However, there are only a few specific intelligence and developmental tests for the blind and visually impaired

Background

- ⇒ **Intelligence tests for VI**, e.g., WIT (1956), BLAT (1971), TTBC (1977), ITVIC (1993)
- ⇒ Outdated or lack norms
- ⇒ Use of only verbal subtests limits construct validity
- ⇒ No German intelligence test for VI
- ⇒ **Developmental tests for VI** are mostly for young children (up to 6 yrs) and mostly informal (i.e., without norms) or norms refer to sighted children
- ⇒ e.g., Reynell-Zinkin Scales (1979), BAYLEY-III (2014), Bielefelder Beobachtungsbögen (1999)

- ⇒ Intelligence **and** Development Scales (IDS, 2009)
- ⇒ IDS is based on the intelligence model of Binet and Simon, **IDS-2 (2018)** refers to the Cattell-Horn-Carroll theory (CHC)
- ⇒ Children and adolescents **aged 5 to 20**
- ⇒ **Six functional domains**
 - 1) Intelligence (14 subtests)
 - 2) Executive functions (4 subtests)
 - 3) Psychomotor skills (3 subtests)
 - 4) Socio-emotional competencies (3 subtests)
 - 5) School achievement (4 subtests)
 - 6) Achievement motivation (2 subtests)

From IDS-2 to IDS-2-bs

- ⇒ IDS-2 suitable for adaptation due to its multidimensional concept
- ⇒ IDS-2-bs (blind-sehbehindert) for children and adolescents who are blind or severely visually impaired
- ⇒ IDS-2 for children and adolescents with milder forms of visual impairments planned

From IDS-2 to IDS-2-bs

⇒ Adaptation challenges and requirements

- ⇒ Visual tasks have to be transferred into **haptic tasks** measuring the same intellectual abilities
- ⇒ Haptic tasks require **simplification**
- ⇒ Haptic tasks require **more time**
- ⇒ Tasks have to be **resolvable by touch and/or vision**, enabling a combination of haptic and visual exploration strategies
- ⇒ Materials and procedures have to **meet the needs of VI**, e.g., written tasks have to be provided in **different braille systems** (i.e., full braille, contracted braille, computer braille) as well as in **large print** (24, 36, 48 pt)

⇒ Principles of adaptation

- ⇒ Subtest reduction
- ⇒ Item reduction
- ⇒ Complexity reduction
(e.g., less dimensions, less colours)
- ⇒ Reduction of alternative solutions
- ⇒ Clear contrasts, no combination of red and green
- ⇒ Colours correspond to textures
(red = smooth, blue = rough, yellow = ribbed)
- ⇒ Provision of user-friendly materials and procedures for the VI (e.g., non-slip mats, extended time limits)

⇒ Overview IDS-2-bs

- 1) Intelligence (11 subtests, 4 of them verbal)
 - 1 verbal and 2 visual subtests dropped
- 2) Executive Functions (2 subtests, 1 of them verbal)
 - 2 visual subtests dropped
- 3) Psychomotor Skills (3 subtests)
 - Gross Motor Skills, Fine Motor Skills, Spatial Relationships
- 4) Socio-emotional Competencies (3 subtests)
 - Emotion Recognition, Emotion Regulation, Social Competent Behavior
- 5) School Achievement (4 subtests)
 - Mathematical Reasoning, Verbal Abilities, Reading, Spelling
- 6) Achievement Motivation (2 subtests)
 - Conscientiousness, Achievement Motivation

From IDS-2 to IDS-2-bs

1) Intelligence, e.g., **Copying figures**

- ↪ 13 instead of 20 items
- ↪ Figures with up to 6 instead of 8 parts (rectangles and triangles)
- ↪ Patterns: thermoform plastic sheets above coloured print
- ↪ Clear contrast, magnetic underlay, extended time limits

IDS-2

IDS-2-bs

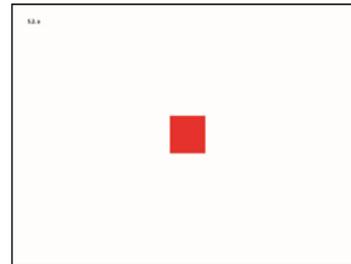


From IDS-2 to IDS-2-bs

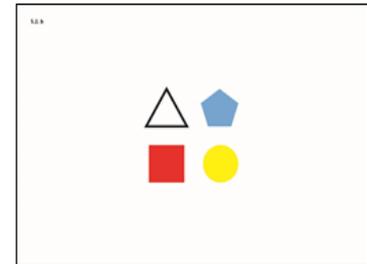
1) Intelligence, e.g., **Figure Recognition**

- ↪ 13 instead of 23 items
- ↪ Recognition of up to 5 out of 8 figures instead of 13 out of 20
- ↪ Less dimensions, colour corresponds to texture (thermoform plastic sheets above coloured print), extended exposition times

IDS-2



IDS-2-bs



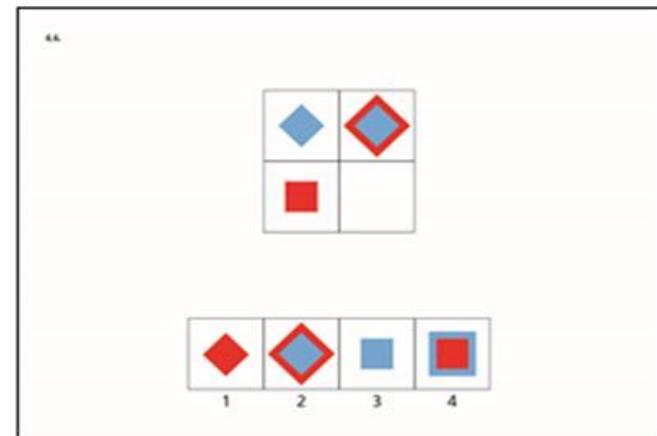
From IDS-2 to IDS-2-bs

1) Intelligence, e.g., Matrix Reasoning

- ↪ 14 instead of 35 items
- ↪ Less colours, less alternative solutions, colour corresponds to texture (thermoform plastic sheets above coloured print), extended time limits

IDS-2

IDS-2-bs



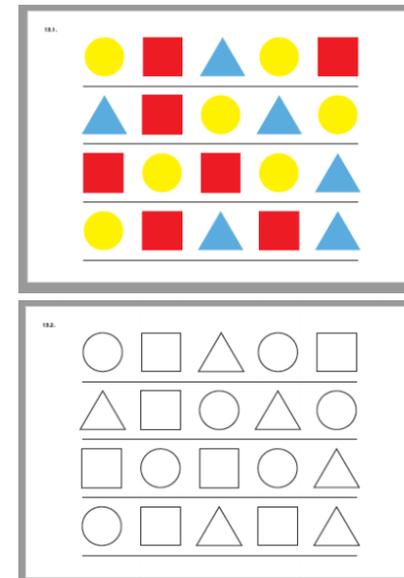
From IDS-2 to IDS-2-bs

2) Executive functions, e.g., Naming textures/colours

- ↪ Test person decides whether to name textures or colours
- ↪ Less colours, simpler figures, less figures, colour corresponds to texture (thermoform plastic sheets above coloured print)

IDS-2

IDS-2-bs



3) Psychomotor Skills, e.g., **Fine Motor Skills**

- ↪ Dark leather strap with wooden weight instead of transparent nylon thread to string beads

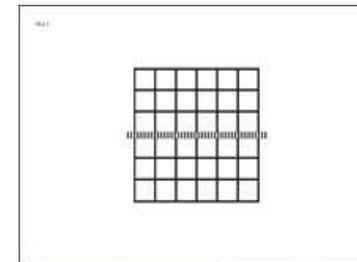
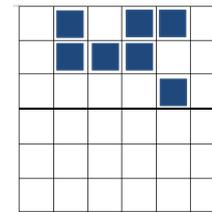


3) Psychomotor Skills, e.g., **Spatial Relationships**

- ↪ Replaces IDS-2 Visual-motor Skills, e.g., Mirroring Figures
- ↪ Magnetic underlay with non-slip film
- ↪ Grid with raised lines, magnetic platelets

IDS-2

IDS-2-bs



4) Socio-emotional Competencies, e.g., **Emotion Recognition**

- ↪ Emotionally spoken pseudo-sentences
("Tulifa bune muliso fakuse sonir.")
instead of photos
- ↪ "The person you hear speaks in a
foreign language. How is this person /
how does this person feel?"

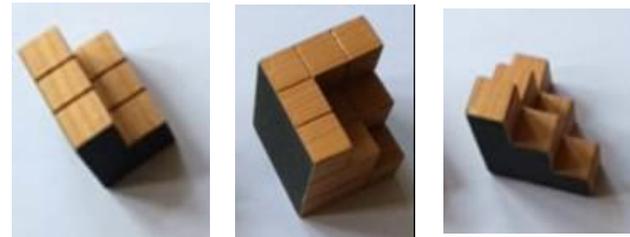
5) School Achievement, e.g., **Mathematical Reasoning**

↪ e.g., Cube tasks

↪ Areas that cannot be seen in the picture are masked by a rough surface

IDS-2

IDS-2-bs



6) Achievement Motivation

- ↪ Conscientiousness and Achievement Motivation questionnaires are read aloud by the tester
- ↪ This procedure is also scheduled in the IDS-2 in the case that the test person has reading problems

- ⇒ **First trials** with 3 children aged 5 to 7 years
 - ⇒ Material is well applicable
 - ⇒ Time limits are mostly adequate
 - ⇒ Testing takes a lot of time (about 4 hours)
 - ⇒ Some subtests might be too complex for the youngest test persons (e.g., Matrix Reasoning)
 - ⇒ Some instructions and procedures were slightly modified (e.g., implementation of example items)
- ⇒ Currently, **pretests** are conducted with test persons covering the whole age range
- ⇒ **Psychometric investigation** planned to begin in 2019



Thank you for your attention!

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