Wechsler Adult Intelligence Scale

Authored by

mohammad looti

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The Wechsler Adult Intelligence Scale (WAIS) intelligence quotient (IQ) tests are the primary clinical instruments used to measure adult and adolescent intelligence. The original WAIS (Form I) was published in February 1955 by David Wechsler, as a revision of the Wechsler-Bellevue Intelligence Scale. The fourth edition of the test (WAIS-IV) was released in 2008 by Pearson.

The Wechsler-Bellevue tests were innovative in the 1930s because they gathered tasks created for nonclinical purposes for administration as a "clinical test battery". Because the Wechsler tests included non-verbal items (known as performance scales) as well as verbal items for all test-takers, and because the 1960 form of Lewis Terman's Stanford-Binet Intelligence Scales was less carefully developed than previous versions, Form I of the WAIS surpassed the Stanford-Binet tests in popularity by the 1960s.

Wechsler defined intelligence as "... the global capacity of a person to act purposefully, to think rationally, and to deal effectively with his environment."

WAIS

The WAIS was initially created as a revision of the Wechsler-Bellevue Intelligence Scale (WBIS), which was a battery of tests published by Wechsler in 1939. The WBIS was composed of subtests that could be found in various other intelligence tests of the time, such as Robert Yerkes' army testing program and the Binet-Simon scale. The WAIS was first released in February 1955 by David Wechsler.

WAIS-R

The WAIS-R, a revised form of the WAIS, was released in 1981 and consisted of six verbal and five performance subtests. The verbal tests were: Information, Comprehension, Arithmetic, Digit Span, Similarities, and Vocabulary. The Performance subtests were: Picture Arrangement, Picture Completion, Block Design, Object Assembly, and Digit Symbol. A verbal IQ, performance IQ and full scale IQ were obtained. This revised edition did not provide new validity data, but used the data from the original WAIS; however new norms were provided, carefully stratified.

WAIS-III

Wechsler Adult Intelligence Scale subscores and subtests

The WAIS-III, a subsequent revision of the WAIS and the WAIS-R, was released in 1997. It provided scores for Verbal IQ, Performance IQ, and Full Scale IQ, along with four secondary indices (Verbal Comprehension, Working Memory, Perceptual Organization, and Processing

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Speed).

Verbal IQ (VIQ)

Included seven tests and provided two subindexes; verbal comprehension and working memory.

The Verbal comprehension index included the following tests:

Information
Similarities
Vocabulary

The Working memory index included:

Letter-Number Sequencing and Comprehension are not included in these indices, but are used as substitutions for spoiled subtests within the WMI and VCI, respectively.

Performance IQ (PIQ)

Included six tests and it also provided two subindexes; perceptual organization and processing speed.

The Perceptual organization index included:

Block Design
Matrix Reasoning
Picture Completion

The Processing speed index included:

Digit Symbol-Coding
Symbol Search

Two tests; Picture Arrangement and Object Assembly were not included in the indexes. Object Assembly is not included in the PIQ.

WAIS-IV

The current version of the test, the WAIS-IV, which was released in 2008, is composed of 10 core subtests and five supplemental subtests, with the 10 core subtests comprising the Full Scale IQ. With the new WAIS-IV, the verbal/performance subscales from previous versions were removed and replaced by the index scores. The General Ability Index (GAI) was included, which consists of

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the Similarities, Vocabulary and Information subtests from the Verbal Comprehension Index and the Block Design, Matrix Reasoning and Visual Puzzles subtests from the Perceptual Reasoning Index. The GAI is clinically useful because it can be used as a measure of cognitive abilities that are less vulnerable to impairment.

Indices and scales

There are four index scores representing major components of intelligence:

Verbal Comprehension Index (VCI)
Perceptual Reasoning Index (PRI)
Working Memory Index (WMI)
Processing Speed Index (PSI)

Two broad scores are also generated, which can be used to summarize general intellectual abilities:

Full Scale IQ (FSIQ), based on the total combined performance of the VCI, PRI, WMI, and PSI
General Ability Index (GAI), based only on the six subtests that comprise the VCI and PRI

Subtests

The Verbal Comprehension Index includes four tests:

Similarities: Abstract verbal reasoning (e.g., "In what way are an apple and a pear alike?)
Vocabulary: The degree to which one has learned, been able to comprehend and verbally express vocabulary (e.g., What is a guitar?)
Information : Degree of general information acquired from culture (e.g., Who is the president of Russia?)
Comprehension : Ability to deal with abstract social conventions, rules and expressions (e.g., What does Kill 2 birds with 1 stone metaphorically mean?)

The Perceptual Reasoning Index comprises five tests

Block Design: Spatial perception, visual abstract processing & problem solving
Matrix Reasoning: Nonverbal abstract problem solving, inductive reasoning, spatial reasoning
Visual Puzzles: non-verbal reasoning
Picture Completion: Ability to quickly perceive visual details
Figure Weights: quantitative and analogical reasoning

The Working Memory Index is obtained from three tests

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Digit span: attention, concentration, mental control (e.g., Repeat the numbers 1-2-3 in reverse sequence)
Arithmetic: Concentration while manipulating mental mathematical problems (e.g., How many 45-cent stamps can you buy for a dollar?)
Letter-Number Sequencing : attention and working memory (e.g., Repeat the sequence Q-1-B-3-J-2, but place the numbers in numerical order and then the letters in alphabetical order)

The Processing Speed Index includes three tests

Symbol Search: Visual perception, speed
Coding: Visual-motor coordination, motor and mental speed
Cancellation : visual-perceptual speed

Standardization

The WAIS-IV was standardized on a sample of 2,200 people in the United States ranging in age from 16 to 90. An extension of the standardization has been conducted with 688 Canadians in the same age range. The median Full Scale IQ is centered at 100, with a standard deviation of 15. In a normal distribution, the IQ range of one standard deviation above and below the mean (i.e., between 85 and 115) is where approximately 68% of all adults would fall.

Other test variants and uses

The WAIS-IV measure is appropriate for use with individuals aged 16-90 years. For individuals under 16 years, the Wechsler Intelligence Scale for Children (WISC, 6-16 years) and the Wechsler Preschool and Primary Scale of Intelligence (WPPSI, 2½-7 years, 3 months) are used.

A short, four-subtest version of the WAIS-III battery has been released, allowing clinicians to form a validated estimate of verbal, performance and full scale IQ in a shorter amount of time. The Wechsler Abbreviated Scale of Intelligence (WASI) uses vocabulary, similarities, block design and matrix reasoning subtests similar to those of the WAIS to provide an estimate of full scale IQ in approximately 30 minutes.

Intelligence tests may also be utilized in populations with psychiatric illness or brain injury, in order to assess level of cognitive functioning, though some regard this use as controversial. Some neuropsychologists use the technique on people suffering brain damage as it leads to links with which part of the brain has been affected, or use specific subtests in order to get an idea of the extent of the brain damage. For example, digit span may be used to get a sense of attentional difficulties. Others employ the WAIS-R NI (Wechsler Adult Intelligence Scale-Revised as a Neuropsychological Instrument), another measure published by Harcourt. Each subtest score is tallied and calculated with respect to non-normal or brain-damaged norms. As the WAIS is

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developed for the average, non-injured individual, separate norms were developed for appropriate comparison among similar functioning individuals.

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