PEARSON

WAIS®-IV
WECHSLER ADULT INTELLIGENCE SCALE®– FOURTH EDITION

Administration, Scoring and Basic Interpretation

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Overview

- Introduction
- Test Structure
- Administration and Scoring
- Basic Interpretation
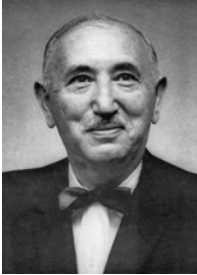
WAIS-IV Kit - Materials

David Wechsler 1896-1981

- Author of the WAIS, WISC, WPPSI, WMS
- Adapted tasks from existing tests (e.g., Army Alpha & Army Beta; Koh's Blocks) and incorporated them into scale
- Verbal IQ, Performance IQ, Full Scale IQ
- First to employ Deviation IQ
- A master clinician who often gave non-standardized intelligence tests

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Wechsler's Definition of Intelligence

"Intelligence is the aggregate or global capacity of the individual to act purposefully, to think rationally, and to deal effectively with his environment."

Wechsler, D. (1939). *The measurement of adult intelligence.* Baltimore: Williams & Wilkins, p. 229.

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WAIS-IV Content and Structure
Ages 16 – 90

Verbal Comprehension Scale

Core Subtests
Information
Similarities
Vocabulary

Supplemental Subtests
Comprehension

Perceptual Reasoning Scale

Core Subtests
Block Design
Matrix Reasoning
Visual Puzzles   New!

Supplemental Subtests
Picture Completion
Figure Weights (16-69)   New!

FSIQ

Working Memory Scale

Core Subtests
Arithmetic
Digit Span

Supplemental Subtests
Letter-Number Sequencing (16-69)

Processing Speed Scale

Core Subtests
Coding
Symbol Search

Supplemental Subtests
Cancellation (16-69)   New!

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Introducing the WAIS-IV

"I'll be asking you to do a number of things today. Some of the things may be really easy for you, but some may be hard. Most people do not answer every question correctly or finish every item, but please try your best. Do you have any questions?"

Subtests - Administration Order (See Record Form)

1. Block Design
2. Similarities
3. Digit Span
4. Matrix Reasoning
5. Vocabulary
6. Arithmetic
7. Symbol Search
8. Visual Puzzles
9. Information
10. Coding

11. Letter-Number Sequencing
12. Figure Weights
13. Comprehension
14. Cancellation
15. Picture Completion

Subtest Substitution

- Only ONE substitution is allowed for each index score
- NO MORE THAN TWO SUBSTITUTIONS ARE ALLOWED WHEN DERIVING THE FSIQ AND GAI
- Substitution introduces error but is preferable to prorating scores

Prorating

- Examiner uses prorating to derive a composite score when all needed subtest scores are not available
- A prorated sum of scaled scores from two core subtests can be used to derive the VCI and PRI
- A prorated sum of scaled scores is NOT available for deriving the WMI or PSI

Prorating - Tables

Pages 226-228
Administration and
Scoring Manual

Administration Guidelines

Start Points   ⬡ Start

Reverse Rules   ⇑ Reverse

Discontinue Rule   ✋ Discontinue

Administration Guidelines

Demonstration	Examiner explains task
Sample Items	Examinee practices
Teaching Items †	Teach if needed and prescribed

Administration Guidelines

- Queries – for responses that are marginal, generalized, functional, made with hand gestures
- Prompts
- Repetition

Recording Responses

Symbol	Use
Q	Administered query
P	Administered prompt
R	Repeated item
DK	Examinee indicated s/he did not know
NR	Examinee did not respond
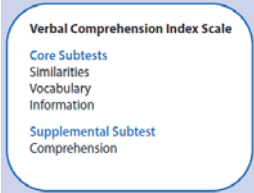
Verbal Comprehension Index Subtests

Measure

– verbal concept formation
– verbal reasoning
– Knowledge acquired from one's environment

Verbal Comprehension Index Scale

Core Subtests
Similarities
Vocabulary
Information

Supplemental Subtest
Comprehension

Similarities

Subtest	Description
Similarities	Examinee is presented two words that represent common objects or concepts and describes how they are similar. Measures verbal concept formation and reasoning.

Similarities – 12 new items

Now I am going to say two words and ask you how they are alike. How are . . . and . . . alike? How are they the same?

Vocabulary

Subtest	Description
Vocabulary	For picture items, the examinee names the object presented visually. For verbal items, examinee defines words presented visually and orally. Measures word knowledge and verbal concept formation.

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Vocabulary – 9 new items

Picture Items: "What is this?

Verbal Items: "I am going to say some words. Listen carefully and tell me what each word means."

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Information

Subtest	Description
Information	Examinee answers questions that address a broad range of general knowledge topics. Measures ability to acquire, retain, and retrieve general factual knowledge.

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Information – 11 new items

See Administration Manual.
Read each item verbatim.

Comprehension

Subtest	Description
Comprehension	Examinee answers questions based on his/her understanding of general principles and social situations. Measures verbal reasoning and conceptualization, verbal comprehension and expression, ability to evaluate and use past experience, ability to demonstrate practical knowledge and judgment.

Comprehension – 11 new items

See Administration Manual.
Read each item verbatim.

Perceptual Reasoning Index Subtests

Measure

– Perceptual and fluid reasoning

– Spatial processing

– Visual-motor integration

Perceptual Reasoning Index Scale

Core Subtests
Block Design
Matrix Reasoning
Visual Puzzles

Supplemental Subtests
Figure Weights (16–69 only)
Picture Completion

Changes to Perceptual Reasoning Subtests

Block Design

— Used Model and Stimulus Book for all teaching items

— Added 4-block diamond items before 9-block items

— Reduced # of items with time bonus

— Added BDN (No Time Bonus) process score

Changes to Perceptual Reasoning Subtests

Matrix Reasoning

– Retained 2 of 4 item-types (2x2 matrix items and series completion items)

– Added sample item for each type

– Clarified 30-second guideline

Picture Completion

– Enlarged visual stimuli

– Added ceiling items

Perceptual Reasoning Subtests

Subtest	Description
Block Design	Working within a specified time limit, the examinee views a model and a picture, or a picture only and uses red-and-white blocks to re-create the design. Measures the ability to analyze and synthesize abstract visual stimuli.

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Perceptual Reasoning Subtests

Subtest	Description
Matrix Reasoning	The examinee views an incomplete matrix or series and selects the response option that completes the matrix or series. Involves fluid intelligence, broad visual intelligence, classification and spatial ability, knowledge of part-whole relationships, simultaneous processing, and perceptual organization

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Perceptual Reasoning Subtests

Subtest	Description
Visual Puzzles	Working within a specified time limit, the examinee views a completed puzzle and selects three response options that, when combined, reconstruct the puzzle.

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Perceptual Reasoning Subtests

Subtest	Description
Visual Puzzles	Involves visual perception and organization, nonverbal reasoning, spatial visualization and manipulation, the ability to anticipate relationships among parts, including the ability to analyze and synthesize abstract visual stimuli.

Administration of Visual Puzzles (VP)

- Examinee must pick exactly 3 responses
- Demonstration Item: demonstrates task and teaches examinee not to stack pieces to get the answer and to choose exactly 3 responses
- Sample Item: practice for examinee, and teaches examinee that pieces may need to be turned to make them fit
- Items have either 20 or 30 second time limit
- Examinees receive a 10-second warning before time limit expires

Perceptual Reasoning Subtests

Subtest	Description
Figure Weights	Working within a specified time limit, the examinee views a scale with missing weight(s) and selects the response option that keeps the scale balanced. Assesses quantitative reasoning and analogical reasoning. Involves inductive and deductive logic. Requires working memory.

Administration of Figure Weights

- Items have either 20- or 40-second time limit.
- Examinees receive a 10-second warning before time limit expires.
- Remember to give prompt when moving to items with 3 scales.

Perceptual Reasoning Subtests

Subtest	Description
Picture Completion	Working within a specified time limit, the examinee views a picture with an important part missing and identifies the missing part. Measures visual perception and organization, concentration, visual recognition of essential details of objects.

Working Memory Index - Subtests

Measure

- attention
- concentration
- mental control
- reasoning

Working Memory Index Scale

Core Subtests
Digit Span
Arithmetic

Supplemental Subtest
Letter–Number Sequencing (16–69 only)

Changes to Working Memory Subtests

Digit Span
— Added new sequencing task
— Eliminated rhyming numbers

Working Memory Subtests

Subtest	Description
Digit Span	**DSF**: examiner reads a sequence of numbers; examinee recalls the numbers in the same order.
	DSB: examiner reads a sequence of numbers; examinee recalls the numbers in reverse order.
	DSS: examiner reads a sequence of numbers; examinee recalls the numbers in ascending order.

Why the changes in Digit Span (DS)?

♦ The shift from one Digit Span task to another requires cognitive flexibility and mental alertness.

♦ *Digit Span Forward* involves rote learning and memory, attention, encoding, and auditory processing.

♦ *Digit Span Backward* involves working memory, transformation of information, mental manipulation, and visuospatial imaging.

♦ *Digit Span Sequencing* is similar to other tasks that are designed to measure working memory and mental manipulation.

Changes to Working Memory Subtests

Arithmetic

— Omitted reference to English measurement system and currency

— Decreased emphasis on mathematical skills and increased emphasis on working memory

Working Memory Subtests

Subtest	Description
Arithmetic	Working within a specified time limit, the examinee mentally solves a series of arithmetic problems. Measures mental manipulation, concentration, attention, short- and long-term memory, numerical reasoning ability, and mental alertness.

Arithmetic

Introduction

"Now I am going to read you some problems. Listen carefully, you can only ask me to read each problem *one* more time."

Changes to Working Memory Subtests

Letter-Number Sequencing

- Eliminated rhyming numbers and letters
- Omitted use of L, I, O, and zero
- Implemented graduated teaching strategy

Working Memory Subtests

Subtest	Description
Letter-Number Sequencing	The examinee is read a sequence of numbers and letters and recalls the numbers in ascending order and the letters in alphabetical order. Involves sequential processing, mental manipulation, attention, concentration, memory span, short-term auditory memory.

Processing Speed Index - Subtests

Measure

- ability to quickly and correctly scan, sequence, and discriminate simple visual information
- short-term visual memory
- attention
- visual-motor coordination

Processing Speed Index Scale

Core Subtests
Symbol Search
Coding

Supplemental Subtest
Cancellation (16–69 only)

Processing Speed Index - Subtests

Subtest	Description
Symbol Search	Working within a specified time limit, the examinee scans a search group and indicates whether one of the symbols in the target group matches.
	Measures processing speed, short-term visual memory, visual-motor coordination, visual discrimination, psychomotor speed, speed of mental operation, attention, concentration.

Changes to Processing Speed Subtests

Symbol Search
 — Enlarged symbols
 — Revised format and instructions

Symbol Search Administration

- Demonstration and Sample items
  - Demonstration item teaches the task
  - Sample item allows examinee to practice
- Time limit = 120 seconds
- Examinee marks either matching symbol in search group or "NO" box
  - Allows for qualitative examination of errors

Processing Speed Index - Subtests

Subtest	Description
Coding	Using a key, the examinee copies symbols that are paired with numbers within a specified time limit. Measures processing speed, short-term visual memory, psychomotor speed, visual perception, visual-motor coordination, visual scanning ability, attention, concentration.

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Changes to Processing Speed Subtests

Coding
- Enlarged symbols and writing space
- Redesigned for more equivalent item difficulty across task
- Revised instructions for consistency with WISC-IV

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Processing Speed Subtests

Subtest	Description
Cancellation	Working within a specified time limit, the examinee scans a structured arrangement of shapes and marks target shapes. Measures processing speed, visual selective attention, vigilance, perceptual speed, visual-motor ability.

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Cancellation - Administration

- Demonstration and Sample items for each test item
  - Demonstration item teaches the task
  - Sample item allows examinee to practice
- Two test items; Time limit 45 seconds each

Scoring

- Calculate raw score for each subtest.
- Convert raw scores to scaled scores.
- Generate sums of scaled scores [indexes, Full Scale].
- Convert sums of scaled scores to composite scores.
- Perform discrepancy comparisons.
- Identify subtest strengths and weaknesses.
- Conduct optional process analysis.

Age Groups - 13

16:0 – 17:11	45:0 – 54:11
18:0 – 19:11	55:0 – 64:11
20:0 – 24:11	65:0 – 69:11
25:0 – 29:11	70:0 – 74:11
30:0 – 34:11	75:0 – 79:11
35:0 – 44:11	80:0 – 84:11
	85:0 – 90:11

Reference Group Scores (Ages 20:0 to 34:11)

Typically used for research or to address a very specific clinical question (how does individual perform on the WAIS-IV subtests in comparison to this age-group).

Reference Group Scores (Ages 20:0 to 34:11)

These scores do not capture the normal variations that occur by age
- Example: our processing speed decreases as we age. If we use this reference group to evaluate the performance of a 60-year-old, his/her scores will be low.

Process Scores

Block Design
- Block Design No Time Bonus (BDN)

Digit Span
- Digit Span Forward (DSF)
- Digit Span Backward (DSB)
- Digit Span Sequencing (DSS)
- Longest Digit Span Forward (LDSF)
- Longest Digit Span Backward (LDSB)
- Longest Digit Span Sequence (LDSS)

Letter-Number Sequencing
- Longest Letter-Number Sequence (LLNS)

Scoring Software

- WAIS-IV Scoring Assistant
- WAIS-IV Report Writer

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What should we do now that VIQ and PIQ are not part of the WAIS?

Page 9 - Technical Manual

"The terms VCI and PRI should be substituted for the terms VIQ and PIQ in clinical decision making and other situations where VIQ and PIQ were used."

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Composite Scores

Full Scale IQ
- Based on 10 core subtests

Index Scores: Primary interpretation level
- VCI & PRI: 3 core subtests each
- WMI & PSI: 2 core subtests each

General Ability Index = VCI + PRI
- Optional Index score

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What is the GAI?

The WAIS-IV GAI provides the practitioner with a summary score that is less sensitive than the FSIQ to the influence of working memory and processing speed.

GAI = sum of scaled scores for VCI subtests and PRI subtests

General Ability Index

Consider using the GAI if a significant and unusual discrepancy exists between

✓ VCI and WMI; or
✓ PRI and PSI; or
✓ WMI and PSI, or
✓ between subtests within WMI and/or PSI.

Deriving and Analyzing the GAI

Step 1. Obtain the General Ability Sum of Scaled Scores

Step 2. Determine the GAI Score (Table C.1 – Tech Manual)

Step 3. Perform the FSIQ-GAI Discrepancy Comparison (Tables C.2, C.3 – Tech Manual)

Table C.2 – Technical Manual

Table C.2 was updated since original publication of WAIS-IV. Go to

http://www.pearsonassessments.com/NR/rdonlyres/76496E27-0B90-478B-B7D5-CF05983EBCD8/0/WAISIVTechManual_TableC2.pdf

Suggested Procedures for Basic Profile Analysis

Step 1. Report and Describe the FSIQ

Step 2. Report and Describe the Index Scores (VCI, PRI, WMI, PSI)

Step 3. Evaluate Index-Level Discrepancy Comparisons
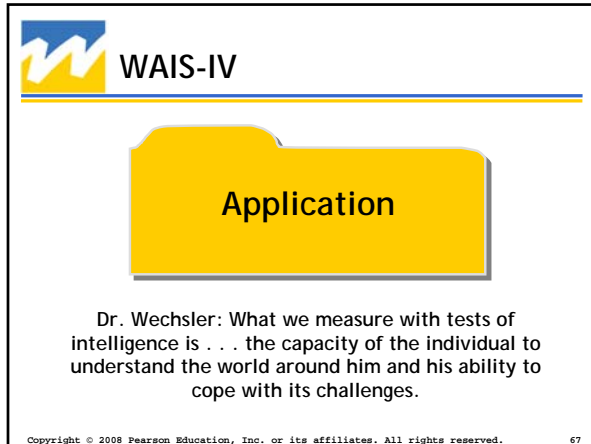
Step 4. Evaluate Subtest Strengths and Weaknesses

Suggested Procedures for Basic Profile Analysis

Step 5. Evaluate Subtest-Level Discrepancy Comparisons

Step 6. (Optional) Evaluate the Pattern of Scores Within Subtests

[Is there a pattern of correct and then few incorrect? or
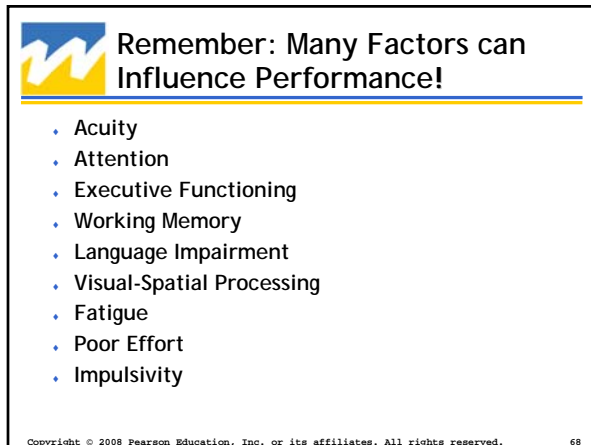Is there substantial item scatter?]

WAIS-IV

Application

Dr. Wechsler: What we measure with tests of intelligence is . . . the capacity of the individual to understand the world around him and his ability to cope with its challenges.
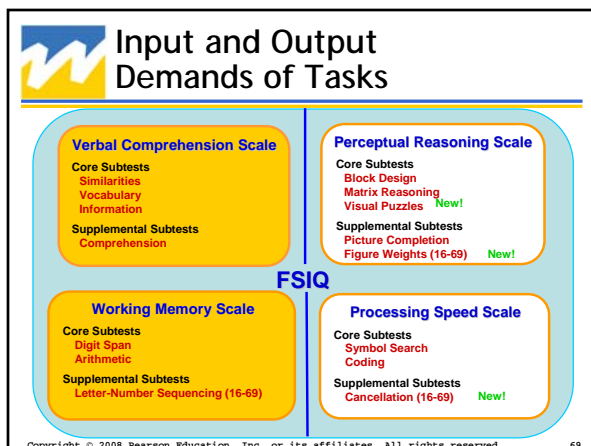

Remember: Many Factors can Influence Performance!

- Acuity
- Attention
- Executive Functioning
- Working Memory
- Language Impairment
- Visual-Spatial Processing
- Fatigue
- Poor Effort
- Impulsivity

Input and Output Demands of Tasks

Verbal Comprehension Scale

Core Subtests
- Similarities
- Vocabulary
- Information

Supplemental Subtests
- Comprehension

Perceptual Reasoning Scale

Core Subtests
- Block Design
- Matrix Reasoning
- Visual Puzzles   New!

Supplemental Subtests
- Picture Completion
- Figure Weights (16-69)   New!

FSIQ

Working Memory Scale

Core Subtests
- Digit Span
- Arithmetic

Supplemental Subtests
- Letter-Number Sequencing (16-69)

Processing Speed Scale

Core Subtests
- Symbol Search
- Coding

Supplemental Subtests
- Cancellation (16-69)   New!

WAIS-IV Scores (Female 40-8)

Index/Subtest	Composite Score/ Scaled Score	Index/Subtest	Composite Score/ Scaled Score
Verbal Comprehension	112	Perceptual Reasoning	88
Similarities	12	Block Design	9
Vocabulary	13	Matrix Reasoning	7
Information	12	Visual Puzzles	8
Working Memory	114	Processing Speed	89
Digit Span	13	Coding	7
Arithmetic	12	Symbol Search	9
Full Scale IQ = 101 General Ability Index = 101			

Abilities Measured

Verbal Comprehension Scale
Core Subtests
Similarities
Vocabulary
Information

Supplemental Subtests
Comprehension

Perceptual Reasoning Scale
Core Subtests
Block Design
Matrix Reasoning
Visual Puzzles   New!

Supplemental Subtests
Picture Completion
Figure Weights (16-69)   New!

FSIQ

Working Memory Scale
Core Subtests
Digit Span
Arithmetic

Supplemental Subtests
Letter-Number Sequencing (16-69)

Processing Speed Scale
Core Subtests
Symbol Search
Coding

Supplemental Subtests
Cancellation (16-69)   New!

WAIS-IV Scores (Male 17-1)

Index/Subtest	Composite Score/ Scaled Score	Index/Subtest	Composite Score/ Scaled Score
Verbal Comprehension	120	Perceptual Reasoning	115
Similarities	14	Block Design	12
Vocabulary	16	Matrix Reasoning	13
Information	11	Visual Puzzles	13
Working Memory	89	Processing Speed	111
Digit Span	7	Coding	11
Arithmetic	9	Symbol Search	13
Full Scale IQ = 112 General Ability Index = 121			

WAIS-IV Normative Sample

- Ages 16-90
- Normative sample: N = 2,200
  - 200 examinees per age band for ages 16-69
  - 100 examinees per age band for ages 70-90
- National sample stratified by:
  - Sex
  - Education Level (age 16-19: parent educ.)
  - Ethnicity
  - Region

Composite Reliabilities
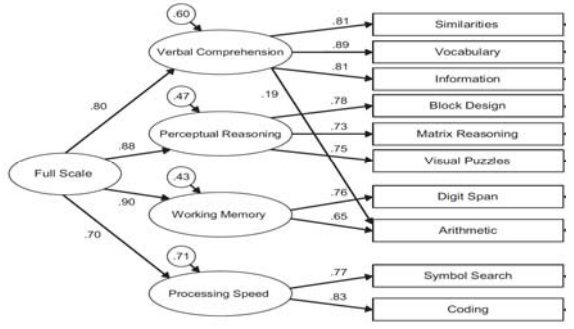
Composite	WAIS-IV (16-90)	WAIS-III (16-89)	WISC-IV (6-16)
VCI (VIQ)	.96	.96 (.97)	.94
POI/PRI (PIQ)	.95	.93 (.94)	.92
WMI	.94	.94	.92
PSI	.90	.88	.88
FSIQ	.98	.98	.97

Core Subtests: Ages 16-90

WAIS-IV Validity Studies

See Technical Manual
  E.g., WISC-IV, WMS-IV, CMS,
  WIAT-II/WIAT-III

WAIS-IV Clinical Studies

– Intellectual Disability: Mild Severity
– Intellectual Disability: Moderate Severity
– Borderline Intellectual Functioning
– Gifted Intellectual Functioning
– Autistic Disorder
– Asperger's Disorder

WAIS-IV Clinical Studies

– Learning Disability: Reading
– Learning Disability: Math
– ADHD
– TBI
– Mild Cognitive Impairment
– Dementia of the Alzheimer's Type
– Depression

Intellectual Disability: Mild Severity

Composite	Clinical Mean	Control Mean	Mean Diff.	p value	Effect Size
VCI	65.9	96.6	30.68	<.01	2.83
PRI	65.4	100.1	34.66	<.01	3.07
WMI	61.5	97.4	35.85	<.01	3.32
PSI	63.8	100.2	36.45	<.01	2.69
FSIQ	58.5	98.1	39.59	<.01	4.01

n = 73

WAIS-IV

Customer Service
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