

Ch. 10: Wechsler Scales

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Review: IQ : # of Factors

Researcher	# of Factors	Comment
Binet	multiple	for practical reasons, only measured 1
Spearman	g	acknowledged other smaller factors (S _i)
Thurstone (et. al)	g _f , g _c	fluid vs. crystallized
Sternberg	3	analytic, creative, practical
Gardner	8	"multiple intelligences" (MI) theory

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Review: Stanford-Binet IQ Test

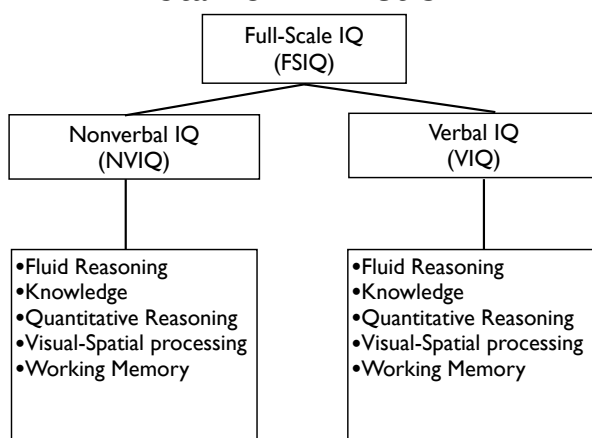
- Structure
 - 5 factors (verbal, non-verbal) = 10 tests
- Psychometrics
 - Reliability: Excellent
 - Validity: ????

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Stanford-Binet 5

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Review: Principles of IQ

- Reification or Nominal fallacy:
 - "Intelligence" is a construct
- Numerical Fallacy:
 - IQ score measures Intelligence
- Ranking Fallacy
 - compare IQ scores, determine worth or value
 - *life-altering* decisions are made

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Cognitive / Info Processing 1

- What is required to correctly answer a single item on an IQ test?
- Verbal comprehension: understand the instructions you hear or read
- Short term memory: remember the instructions
- Long term memory: retrieve answer or procedure
- Working memory: juggle information, do calculations, etc.
- Judgement / Reasoning : decide between competing answers
- Attention / Concentration: remain focused on task

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Cognitive / Info Processing 2

- Verbal: give reply with voice
- Motor: respond with hands
- Interpersonal: evaluate response of examiner: praise? criticism?
- Intrapersonal / Metacognition: judge performance, adjust strategy accordingly
- Cognitive science believes many of these to be independent processes subsumed by independent brain systems

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Performance Scale

- Declarative (“knowing that”)
 - What is the distance between NYC and Paris?
 - Dependent on Language
 - Trainable? subject to education / culture?
- Procedural (“knowing how”)
 - Riding a bicycle
 - Arrange blocks to form a pattern
 - Long Division: divide 347 by 19
- Early IQ tests focused more on Declarative tasks

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Wechsler Scales

- WAIS-4 : Adult Intelligence Scale (2008)
 - Evolved from Wechsler-Bellevue Intelligence Scale (1937)
 - Designed for Adults
 - Point scale rather than Age scale
 - Added *Performance* items (vs. SB which used only language-based items)
 - Multiple factors, rather than “g”
- WISC-4 : Intelligence Scales for Children
- WPPSI-3 : Preschool and Primary Scale

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David Wechsler

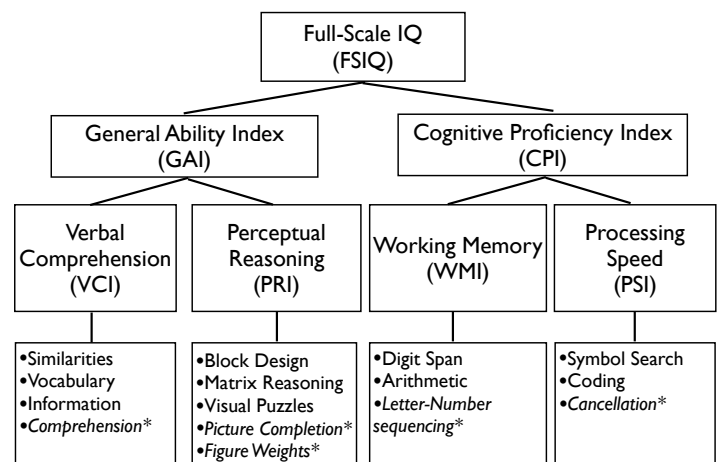
- “[...]Spearman’s theory of general intelligence (g) was too narrow. [It is] an effect rather than a cause[...] Non-intellective factors, such as personality, contribute to the development of each person’s intelligence.”
- “Intelligence is the aggregate or global capacity of the individual to act purposefully, to think rationally and to deal effectively with his environment”
- Deviation IQ (DQ) score replaced $IQ = MA/CA$

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WAIS-4

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* is not part of core battery

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IQ Terminology

IQ Range (M=100, SD=15)	Stanford-Binet 5	WAIS 4
145-160	Very gifted or highly advanced	Very Superior
130-144	Gifted or very advanced	
120-129	Superior	Superior
110-119	High Average	High Average
90-109	Average	Average
80-89	Low Average	Low Average
70-79	Borderline	Borderline
55-69	Mildly impaired or delayed	Very Low
40-54	Moderately impaired or delayed	

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WAIS-IV General Ability Index (GAI)¹⁴⁴⁶

- Verbal Comprehension Index (VCI)
 - Vocabulary
 - Similarities
 - Information
 - **Comprehension*
- Perceptual-Reasoning (PRI)
 - Block Design
 - Matrix Reasoning
 - Visual Puzzles
 - **Picture Completion*
 - **Figure Weights*

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VCI: Verbal Comprehension Index¹⁴⁴⁷

- Vocabulary
 - “What is a guitar?”
- Similarities
 - “In what way are an apple and a pear alike?”
- Information
 - “How far is it from New York to Paris?”
- Comprehension
 - ...

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Comprehension Example

- “Why is food often sold in sealed containers?”

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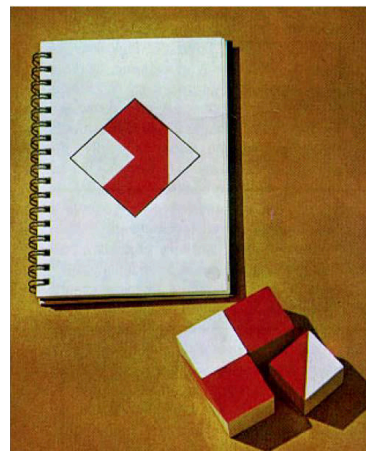
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PRI: Perceptual Reasoning Index¹⁴⁵⁰

- Perceptual-Reasoning (PRI)
 - Block Design
 - Matrix Reasoning
 - Visual Puzzles
 - **Picture Completion*
 - **Figure Weights*

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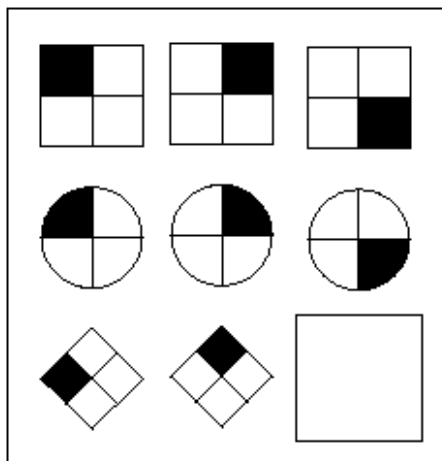
Block Design



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Matrix Reasoning

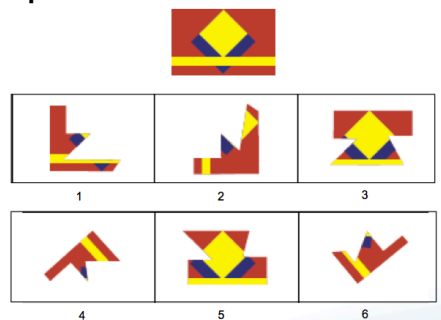


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Visual Puzzles

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Which 3 of these pieces go together to make this puzzle?



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Picture Completion

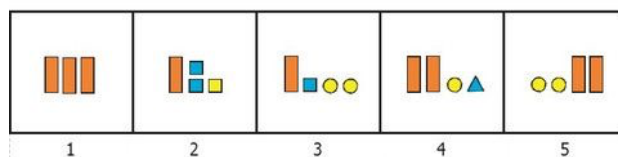
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Figure Weights

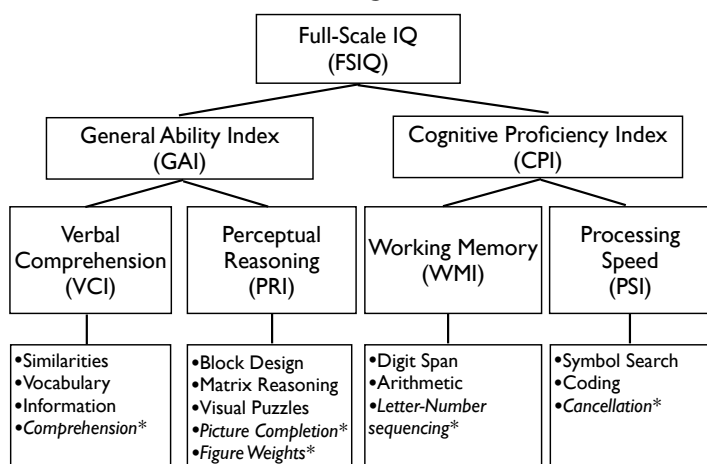
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WAIS-4

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WMI: Working Memory Index

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- Digit Span
- Arithmetic
- Letter-Number Sequencing

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Digit Span Example

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Arithmetic

- “How many 45-cent stamps can you buy for a dollar?”

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Letter-Number Sequencing

- Repeat Q-1-B-3-J-2 in numerical and alphabetical order

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PSI: Processing Speed Index

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- Symbol Search
- Coding
- Cancellation

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Symbol Search

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- Do the two symbols on the left match the symbols on the right?

⇐

∠

→

∩

↗

∠

||

YES

NO

±

⊥

⇐

||

⊥

└

⊥

YES

NO

∠

∩

≠

↗

✗

⊖

∠

YES

NO

∩

⊥

∠

||

↗

∩

≠

YES

NO

↗

⊥

∩

✗

⊥

⊥

∩

YES

NO

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WAIS-IV: Coding

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Digit symbol substitution test

1

2

3

4

5

6

7

8

9

↔

↓

≡

|||

≠

□

Φ

∈

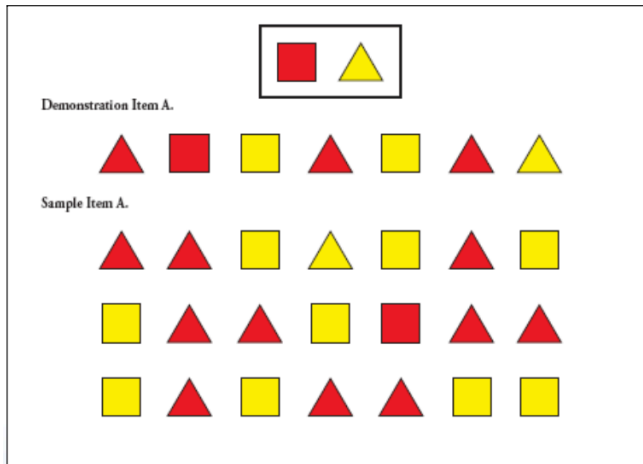
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2	9	2	9	4	9	4	9	1	8	9	3	1	7	2	3	6	4	8	3	1	7	8	2	5
4	7	1	7	5	8	4	1	5	2	6	9	9	5	6	7	6	2	9	4	8	7	2	8	6
8	6	2	8	2	9	4	7	4	8	6	7	3	1	6	2	1	8	7	4	3	1	6	2	9
2	5	4	6	1	6	3	1	2	7	2	6	4	9	1	8	5	7	1	5	4	5	3	9	2
3	9	7	1	7	1	3	5	7	6	1	6	5	9	1	3	1	3	9	8	9	7	3	4	3

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WAIS-IV: Cancellation

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WAIS-4

- Which of these tests are completely “pure” measures of an ability?
 - Verbal / language issues?
 - Cultural bias?
 - Motivation?
 - Expectancy effects?
 - Strategy : speed vs. accuracy?

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WAIS Psychometrics-Reliability

- 11 subtests, 4 index scores
- Full-Scale IQ (FSIQ) $r = .98$
 - Verbal IQ (VIQ) $r = .97$
 - Performance IQ (PIQ) $r = .94$
- FSIQ: SEM = 2.29: 95% of the time a measured score is +/- 4.6 of actual score
- Very good normative sample (n=2450 gender, ethnicity, region, education level)
- Widely researched in many fields (portions of the WAIS are used as neuropsychological tests)

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WAIS Psychometrics-Validity

- Reliability is good, but...
- How can we measure validity?

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WAIS Psychometrics-Validity

- Correlations of .93 with WISC
- What should the Criterion be?

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WAIS Subtest Pattern Analysis

- Can we analyze patterns on subtest scores to make inferences about a person's functioning?
- A person scores highly on a subtest not known to be affected by education (Similarities), but low on a subtest affected by motivation, anxiety and speed (Digit-symbol coding) and low on Information.
- Conclude this person has potential, but has trouble learning or performing in normal situations.
- Issue - test-retest reliabilities are low (.6 to .9) for individual subtests.
- Research supporting Pattern Analysis is weak

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WISC-IV and WPPSI-III

- WISC - Wechsler Intelligence Scale for Children:
- A version of the WAIS, specially adapted and revised to be more appropriate for children aged 6 thru 16
- WPPSI-III - Wechsler Preschool and Primary Scale of Intelligence:
- for children 2-6 years old

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Multiple Intelligences

- Both the SB5 and WAIS-4 test multiple factors of intelligence
- this is not the same thing as multiple intelligences
- Which of Gardner's 8 intelligences are actually measured by the SB5 or WAIS-4?

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