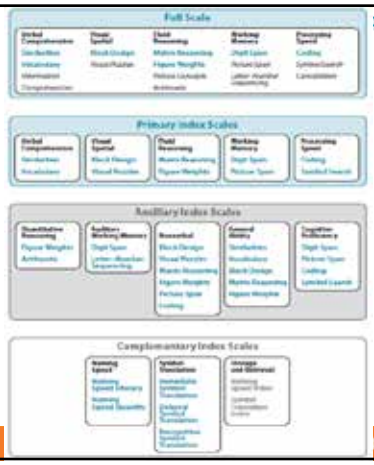
Agenda

- Brief Overview: WISC-V Test Structure
- Process Scores
- Contrast Scores
- Case Study and Interpretation Notes

WISC-V

Test Framework



WISC-V

Full Scale (FSIQ)

Full Scale

Verbal Comprehension	Visual Spatial	Fluid Reasoning	Working Memory	Processing Speed
Similarities	Block Design	Matrix Reasoning	Digit Span	Coding
Vocabulary	Visual Puzzles	Figure Weights	Picture Span	Symbol Search
Information		Picture Concepts	Letter–Number Sequencing	Cancellation
Comprehension		Arithmetic		

WISC-V

Primary Index Scales

Primary Index Scales

Verbal Comprehension	Visual Spatial	Fluid Reasoning	Working Memory	Processing Speed
Similarities	Block Design	Matrix Reasoning	Digit Span	Coding
Vocabulary	Visual Puzzles	Figure Weights	Picture Span	Symbol Search
VCI	VSI	FRI	WMI	PSI

WISC-V

Ancillary Index Scales

Ancillary Index Scales

Quantitative Reasoning	Auditory Working Memory	Nonverbal	General Ability	Cognitive Proficiency
Figure Weights	Digit Span	Block Design	Similarities	Digit Span
Arithmetic	Letter–Number Sequencing	Visual Puzzles	Vocabulary	Picture Span
		Matrix Reasoning	Block Design	Coding
		Figure Weights	Matrix Reasoning	Symbol Search
		Picture Span	Figure Weights	
		Coding		
QRI	AWMI	NVI	GAI	CPI

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Complementary Index Scales

Complementary Index Scales

Naming Speed	Symbol Translation	Storage and Retrieval
Naming Speed Literacy	Immediate Symbol Translation	Naming Speed Index
Naming Speed Quantity	Delayed Symbol Translation	Symbol Translation Index
	Recognition Symbol Translation	
NSI	STI	SRI*

*The SRI (storage retrieval index) is unique because it is derived from these index scores rather than subtest scores.

Evidence of Internal Consistency

Average Reliability Coefficient	
Composite	Overall Average (r_{xx}[a])
VCI	.92
VSI	.92
FRI	.93
WMI	.92
PSI	.88
FSIQ	.96
QRI	.95
AWMI	.93
NVI	.95
GAI	.96
CPI	.93

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Two New Ancillary Scores: Expanded Index Scores

VECI (Verbal Expanded Crystalized Index)
SI, VO, IN, CO subtests scales scores

EFI (Expanded Fluid Index)
MR, FW, PC, AR, subtests scales scores

These scores do not replace any WISC-V Index Scores, but expand the options of composites that are already available.

WISC-V Technical Report #1
available on www.pearsonclinical.com

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Expanded Index Scores

VECI & EFI

- The EFI can be utilized in situations when the student demonstrates language difficulties or delays. In addition, it can be utilized when the student has motor impairments.
- The NVI can be utilized for children who have language problems too, but the EFI is a measure of fluid reasoning and ***doesn't load on processing speed or working memory.***

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WISC-V: It is a process

- Timeline
  - FSIQ and Primary Scores
  - Add Ancillary and Complementary
  - Add Process Score/Contrast Score Interpretation
  - Add Process Observations

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Types of Process Scores

Scaled Process Scores

Standard Process Scores

Raw Process Scores

Contrast Scores

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What are Process Scores?

Additional measures that provide but do not replace information (e.g., primary scaled score) about a child's performance on a specific subtest.

Based on the Boston Approach to neuropsychological assessment, as articulated by Edith Kaplan, which emphasizes the ***qualitative*** evaluation of test performance (WISC-V Tech manual – page 17)

Process Analysis on the WISC-V is designed to help determine the nature of errors committed on the test.

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Why Add Process Scores to WISC-V?

- Provide additional information about subtest performance.
- Enhance depth of interpretation and understanding of performance.
- Facilitate understanding of scores from a process approach perspective.

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Why Add Process Scores to WISC-V?

- Process analysis can help practitioners evaluate specific processing styles, which can be important when describing cognitive strengths and weaknesses, making diagnostic decisions, or generating strategies as part of a treatment plan or educational program.
- Process analysis can occur from an **inter-individual** perspective by comparing the child's process scores to those obtained by his or her same-age peers.
- **Intra-individual** process analysis is performed by evaluating the child's process scores in relation to his or her other obtained scores (i.e., subtest or process scores).

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When are these scores applied?

- These scores are usually applied when the clinician suspects that other cognitive processes (e.g., not the core skill being evaluated) may be affecting the child's performance on a test and that the scaled score may not reflect all the ability the child has in that domain (e.g., motor effects on Block Design)
- Or, they wish to identify a specific type of cognitive difficulty that may have impacted performance

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WISC-V Process Scores

- The WISC-V provides a total of 10 scaled or standard process scores across on 5 subtests; Block Design, Digit Span, Cancellation, and Naming Speed Literacy and Naming Speed Quantity
- There are 16 Raw Process Scores across 9 subtests: Block Design, Digit Span, Picture Span, Letter Number Sequencing, Coding, Symbol Search, and Naming Speed L and Q, (include longest span and error raw scores) converted to Base Rates
- There are 6 Contrast Scores across 4 Subtests: Digit Span, Letter Number Sequencing, Cancellation, Symbol Translation

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Scaled/Standard Process Scores

Note that scaled and standard process scores may not be substituted for any scaled or standard subtest score and do not contribute to the FSIQ.

Scaled or Standard Process Score	Abbreviation	Score Type
Block Design No Time Bonus	BDn	Scaled
Block Design Partial Score	BDp	Scaled
Digit Span Forward	DSf	Scaled
Digit Span Backward	DSb	Scaled
Digit Span Sequencing	DSs	Scaled
Cancellation Random	CAr	Scaled
Cancellation Structured	CAs	Scaled
Naming Speed Color-Object	NSco	Standard
Naming Speed Size-Color-Object	NSsco	Standard
Naming Speed Letter-Number	NSln	Standard

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Process Scores: Block Design

- Block design is a complex task requiring visual-spatial abilities but also speed of processing and fine-motor control
  - Block Design No Time Bonus (BDn) Scaled Score
  - Block Design Partial Score

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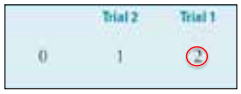
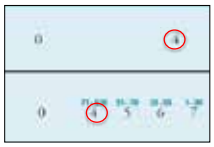
Block Design No Time Bonus (BDn)

The Block Design No Time Bonus (BDn) Total Raw Score is derived from a total raw score that does not include time-bonus points.

BDn Items 1–3: Score **0–2** points. **Items 4–13:** Score **0** or **4** points.





BDn (Max = 46)
30

Block Design No Time Bonus (BDn)

- To calculate the total raw score for BDn, add up scores of 2, 1, or 0 points earned on Items 1–3
- For Items 4–13, add up scores of 4 points if the child constructed the design correctly within the time limit.
  - Add 0 points if the child does not construct the design correctly within the time limit.
- The Maximum Total Raw Score for BDn is 46 points.

Block Design No Time Bonus (BDn)

- The Block Design No Time Bonus Total Raw Score is converted to a scaled process score.
  - For examinees who complete the designs accurately and slowly, the Block Design No Time Bonus (BDn) score will provide information on **accuracy without the additional demand of speed**.
  - The BDn score's reduced emphasis on speed of performance may be particularly useful when a child's physical limitations, problem-solving strategies, or personality characteristics are believed to affect performance on timed tasks.

Block Design No Time Bonus (BDn)

- The discrepancy between BD and BDn scores may provide information on the relative contributions of speed to performance on Block Design.
  - If the score on BDn > BD, it is possible that **difficulties with rapid processing of visual-perceptual information or motor execution** influenced performance on Block Design.
  - If the score on BD > BDn, it is possible that abilities in this domain are **not due to problems with processing speed and execution**.
    - BD and BDn are typically very similar – a scaled score difference of more than 1 point was rare in the normative sample (<2%).

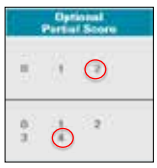
Process Scores: Block Design Partial (BDp)

- Block Design Partial (BDp) Scaled Score - assesses the child's ability to complete portions of the full design. Some children fail whole items due to missing 1 or 2 blocks but in general show good spatial skills.
  - This score also relates to processing speed but is affected by time limit, not bonus time.
- Block Design Partial (BDp)– reduces the emphasis on speed, providing partial credit to children to complete a majority of the blocks within the time limit.
  - BDp reduces the emphasis on attention to detail, as credit is awarded for any part of the design that is constructed correctly.

Block Design Partial Score (BDp)

The Block Design Partial (BDp) Total Raw Score is derived from the total number of correctly placed blocks for all items (including reversal items), and time-bonus points awarded for Items 10–13.

BDp (Max = 82)
51



Block Design Partial Score (BDp)

WISC-V

- The discrepancy between BD and BDp may provide insight about the relative contributions of emphasis on **attention to detail and speed** to performance on Block Design.
  - BDp > BD suggests that difficulties with rapid processing of visual-perceptual information, motor execution, or attention to detail have influenced performance on Block Design.
  - BD > BDp implies that abilities in this domain are not due to problems with speed and attention to detail.
    - BD and BDp are typically very similar. A scaled score difference of more than 2 points was rare in the normative sample (<5%).

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Scaled/Standard Process Scores

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Note that scaled and standard process scores may not be substituted for any scaled or standard subtest score and do not contribute to the FSIQ.

Scaled or Standard Process Score	Abbreviation	Score Type
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Digit Span Sequencing	DSs	Scaled
Cancellation Random	CAr	Scaled
Cancellation Structured	CAs	Scaled
Naming Speed Color-Object	NSco	Standard
Naming Speed Size-Color-Object	NSsco	Standard
Naming Speed Letter-Number	NSln	Standard

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Process Scores: Digit Span

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- Digit Span is a complex task requiring a number of related processes
  - Digit Span Forward-most basic evaluation of the **phonological loop** and general capacity for unrelated pieces of information (in contrast to sentence span)
  - Digit Span Backward-additional working memory load associated with reorganizing unrelated information should be impacted by span capacity. However, sometimes backward is better than forward (e.g., procedural learning, more focused attention, better effort, etc.)
  - Digit Span Sequencing-additional WM load related to the **re-sequencing** of related pieces of information there is an **evaluative** (place on number line) **component** and re-sequencing can only occur once all digits are presented

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Digit Span

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The Digit Span Forward (DSf) Total Raw Score is obtained by summing the Forward item scores.

Digit Span Forward (DSf) Total Raw Score (Maximum = 18) 8

The Digit Span Backward (DSb) Total Raw Score is obtained by summing the Backward item scores.

Digit Span Backward (DSb) Total Raw Score (Maximum = 18) 8

The Digit Span Sequencing (DSs) Total Raw Score is obtained by summing the Sequencing item scores.

Digit Span Sequencing (DSs) Total Raw Score (Maximum = 18) 5

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Digit Span

WISC-V

- Each task uses the same stimuli, the numbers 1 through 9;
- However, the response process required by the child differs by task.
- On the Forward task, the child repeats what is said verbatim.
  - The task increases in difficulty and requires working memory when the number of digits exceeds the child's ability to repeat them without rehearsal.
  - This task represents basic capacity in the phonological loop.
- The Backward task invokes working memory because the child must repeat the digits in a different (i.e., reverse) sequence than was presented, requiring manipulation of the information before responding.

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Digit Span

WISC-V

- The increased demands for **mental manipulation** of information on the **Backward** task places additional demands on working memory abilities and attention, as do similar tasks, like Sequencing.
- The **Sequencing** task requires a child to sequence the digits by value, invoking **quantitative knowledge** in addition to WM.

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Digit Span

- The Digit Span Forward to Digit Span Backward and the Digit Span Forward to Digit Span Sequencing discrepancy comparisons
  - provide information about **storage capacity versus mental manipulation** ability with cognitively simple task demands – the Forward condition – versus more cognitively complex task demands – the Backward and Sequencing conditions.

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Naming Speed Letter-Number	NSln	Standard

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Process Scores: Cancellation

- Cancellation Random vs Structured-primary difference between the two conditions is the placement of the visual stimuli on the page
- Cancellation Random Scaled Score - stimuli in the CAr condition are not organized which increases the difficulty to visually scan the page for targets. Using a strategy (e.g., by quadrant, by target type, etc.) may improve efficiency of visual search on CAr.

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Process Scores: Cancellation

- Cancellation Structured - all stimuli appear in organized rows which can easily be scanned in horizontal (right-left) or vertical (up-down) directions.
- CAs is affected by procedural learning because CAs follows Car.
  - The examinee has an opportunity to better understand the rules and can alter their approach to the tasks based on their performance on CAr.

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Cancellation Random (CAr)
Cancellation Structured (CAs)

- The Cancellation Random (CAr) Total Raw Score is the total raw score for Item 1.
- The Cancellation Structured (CAs) Total Raw Score is the total raw score for Item 2.

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Process Scores: Cancellation

- The discrepancy comparison between CAr and CAs provides information about how performance on Cancellation varies with the arrangement of visual stimuli. This discrepancy shows utility in discriminating between matched controls and children with reading disorders, intellectual disability-mild severity, closed head injuries, and motor impairments.
- A CAs > CAr discrepancy suggests that the child may benefit from the structured presentation format.

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Process Scores: Cancellation

- A CAr > CAs discrepancy may indicate the child either applied a more effective strategy to the CAr task than to the CAs task or did not benefit from the structured presentation format (i.e., a disorganized search strategy despite the structured arrangement of visual stimuli).
- Observational data about the child's search strategies could provide additional information to support or refute hypotheses regarding the influence of a structured presentation format on Cancellation performance.

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Scaled/Standard Process Scores

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Naming Speed Size-Color-Object	NSsco	Standard
Naming Speed Letter-Number	NSln	Standard

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Naming Speed

The Naming Speed Color-Object (NSco) Naming Speed Size-Color-Object (NSsco), and Naming Speed Letter-Number (NSln) standard process scores represent the child's performance on Items 1, 2, and 3, respectively, of the Naming Speed Literacy subtest.

Process Score	Item	Ages
NSco	1	6 years
NSsco	2	6-8 years
NSln	3	7-8 years

Because Naming Speed Literacy for children aged 9–16 is based only upon Item 3 performance, a Naming Speed Letter-Number score is unnecessary for this age group.

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Naming Speed

For a child aged 6-8 years, the score for Naming Speed Literacy is based on Size-Color-Object Naming (Item 2) and Letter-Number Naming (Item 3).

Ages 7–8 | 108 (2) + 41 (3) = 149 (Max = 1200)

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Deriving Scaled Process Scores and Standard Process Scores

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Deriving Scaled Process Scores and Standard Process Scores

- The table shows the conversion of Total Raw Score to Scaled Score for Block Design, Digit Span, and Cancellation.
- It also shows the Total Raw Score to Standard Score conversion for Naming Speed.
- The Total Raw Score to Scaled/Standard Score Conversion table is used with Tables C.6 and C.14 in the Administration and Scoring Manual Supplement
- These scores represent the child's performance as it compares to other children of the same age in the normative sample.

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Analyzing Process-Level Pairwise Differences

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Use WISC–V Administration and Scoring Manual Supplement, Tables C.10, C.13, C.15 and C.16.

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Process Analysis Score Report

WISC–V

Process Level Pairwise Difference Comparisons (Scaled Scores)

Process Score Comparison	Score 1	Score 2	Difference	Critical Value	Significant Difference	Base Rate
BD - BDn	11	10	1	3.40	N	17.1%
BD - BDp	11	14	-3	3.11	N	3.6%
DSf - DSb	7	6	1	3.69	N	41.3%
DSf - DSs	7	7	0	3.63	N	
DSb - DSs	6	7	-1	3.66	N	42.9%
LN - DSs	7	7	0	3.38	N	
CAr - CAs	10	10	0	3.59	N	

Statistical significance (critical values) at the .05 level.

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Raw Process Scores

WISC–V

Longest Span and Sequence	Error Scores	Process Observations
Maximum performance on a span task	Tally of the number of times a certain type of error is committed during a subtest or an item	Tally of the number of times a certain behavior is observed during a subtest

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Longest Span and Sequence Scores

WISC–V

Although these process scores are often consistent with the scaled scores obtained on the corresponding subtest, the longest span and sequence scores may better represent the child's maximum performance than the scaled score when performance varies across items (e.g., when the child obtains scores of 1 and 0 points on trials within and across several items).

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Longest Span and Sequence Score

WISC–V

Longest Span and Sequence Score	Abbreviation
Longest Digit Span Forward	LDSf
Longest Digit Span Backward	LDSb
Longest Digit Span Sequence	LDSs
Longest Picture Span Stimulus	LPSs
Longest Picture Span Response	LPSr
Longest Letter–Number Sequence	LLNs

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Process Scores: Longest Digit Span

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- Why would you use this score?
  - If child exhibits variable performance across items (e.g., scores of 1 and 0 points variably across the items, rather than more typical pattern of mostly 1's, then a few 0's, then discontinue criterion is met)
- The discrepancies between Longest Digit Span raw scores (LDSf, LDSb, LDSs) are informative when variable performance across trials or items of similar span length as well as the Forward, Backward, and Sequencing tasks is present.

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Process Scores: Digit Span

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- Longest Digit Span measures the **consistency of performance** on a given trial, high span versus low scaled score suggests inconsistency, possible attention issues, or possible effort problems. Reported as base rates. (SS = Scaled Scores)
- Digit Span Forward Longest Span (LDSf) - in cases of low SS and high performance on Longest Span suggests capacity is quite good but ability to actualize that space may be affected by other factors (i.e., attention)
- Digit Span Backward Longest Span (LDSb) - when this score is better than SS, actual mental manipulation ability may be better than estimated but is affected by other processes
- Digit Span Sequencing Longest Span (LDSs) - when it is better than SS, actual mental re-sequencing ability may be better than estimated but is affected by other processes

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Process Scores: Picture Span

WISC–V

- Longest Span measures the consistency of performance on a given trial, high span versus low scaled score suggests inconsistency, possible attention issues, potential issue with planning, or possible effort problems. Reported as base rates.
- Picture Span Longest Stimulus (LPSs) - the maximum number of stimulus shown to the child is 8, this score reflects the most stimuli to which the child provided a correct response.
- Picture Span Longest Response (LPSr) -items vary in the number of objects from which a response can be made. Items within the same stimulus number can have more or fewer response choices. This score indicates the item in which the child made a correct response with the most number of response options.

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Longest Picture Span Scores

WISC–V

- What is the span?
- The Longest Picture Span Stimuli (LPSs) Raw Score is the number of pictures on the stimulus page for the last item assigned a perfect score. For example, if Item 9 is the last item assigned a perfect score, the LPSs is 3.
- The Longest Picture Span Response (LPSr) Raw Score is the number of pictures on the response page for the last item assigned a perfect score. For example, if Item 9 is the last item assigned a perfect score, the LPSr is 6.

LPSs (Max = 8)	LPSr (Max = 12)
3	6

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Longest Letter-Number Sequence Scores

WISC–V

- What is the span?
- The Longest Letter–Number Sequence (LLNs) Raw Score is the total number of letters and numbers recalled on the last trial scored 1 point.
- For example, if a child recalls a sequence of 3 letters and numbers once and misses three trials with sequences of 4 letters and numbers, the LLNs is 3.

LLNs (Max = 8)
3

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Deriving Base Rates

WISC–V

- Raw scores for Longest Span and Sequence tasks are converted to base rates.
- For base rates, refer to Tables C.17 and C.18 in the WISC–V Administration and Scoring Manual Supplement.

Raw Score to Base Rate Conversion

Process Score	Raw Score	Base Rate
Longest Digit Span Forward (LDSf)	6	38.0
Longest Digit Span Backward (LDSb)	4	34.0
Longest Digit Span Sequence (LDSs)	4	74.0
Longest Picture Span Stimulus (LPSs)	3	85.5
Longest Picture Span Response (LPSr)	6	96.5
Longest Letter–Number Sequence (LLNs)	3	85.5

- Base rates are interpreted in terms of the rareness of a finding.
- For example, for LDSf, 38% of the children in the same age group obtained the same score or a lower score.

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Error Scores

WISC–V

- Error scores are raw process scores that are based on specific types of errors made by the child. For example, an examiner may note the number of misnamed quantities during administration of Naming Speed Quantity.
- The WISC–V provides a total of 10 error scores on five subtests: Block Design, Coding, Symbol Search, Naming Speed Literacy, and Naming Speed Quantity.
- For instructions on how to calculate the error scores for the five subtests, see the Score section of each subtest in Chapter 3 of the Administration and Scoring manual.

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WISC–V

Error Score	Abbreviation
Block Design Dimension Errors	BDde
Block Design Rotation Errors	BDre
Coding Rotation Errors	CDre
Symbol Search Set Errors	SSse
Symbol Search Rotation Errors	SSre
Naming Speed Literacy Errors	NSLe
Naming Speed Color–Object Errors	NScoe
Naming Speed Size–Color–Object Errors	NSscoe
Naming Speed Letter–Number Errors	NSlne
Naming Speed Quantity Errors	NSQe

Note. The Block Design Dimension Errors (BDde) score is similar to *break in configuration errors* in the published literature. The alternate term is used to avoid confusion with any prior definitions because break in configuration errors are not defined consistently across studies.

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Error Scores: Block Design

WISC–V

- Block Design Dimension Errors- a base rate score that refers to configuration breaks in the design (e.g., not following 2 X 2 or 3 X 3 configuration). Reflects a global versus local information processing. Individuals that get too focused on the design elements may make configuration errors – rare in general and more rare in final solutions. Do not over interpret, should see a consistent pattern of configuration breaks to make statements regarding breakdown in global versus local processing.
- Block Design Rotation Errors- a base rate score that refers to greater than 30 degree rotation of the entire design that is not self-corrected by the child when the design is complete. Very high rate of errors could reflect significant problems with understanding or remembering the task directions or a spatial processing deficit

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Block Design Dimension Error (BDde)

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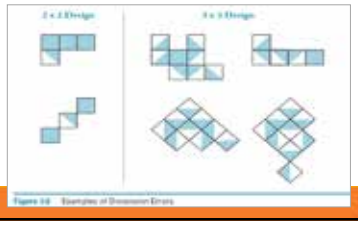
- A dimension error occurs when the maximum dimension for a square- or diamond-shaped design is exceeded at any time during the child's construction.
- For example, the child aligns 3 blocks in a row while constructing a 2x2 design, or aligns 4 blocks in a column while constructing a 3x3 design.



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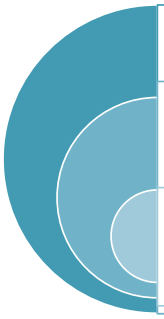
Interpretation of Rotation Errors

WISC–V



Rotation errors on BD, CD, and SS subtests are unusual.

A consistent pattern of rotation errors (base rate ≤ 10%) across all three subtests may indicate a broader issue with mental rotation.

Performance on Visual Puzzles may help clarify the presence of a broader problem if the child has more difficulty with items involving rotated response options.

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Rotation Errors

WISC–V

- Mental rotation is an area of considerable interest because of its association with intelligence and working memory (Ling, Burton, Salt, & Muncer, 2009).
- Mental rotation is a major component of some structural models of intelligence with substantial empirical support (Johnson & Bouchard, 2005a, 2005b; Johnson et al., 2007).
- A number of WISC–V subtests involve mental rotation ability. Rotation error scores for Block Design, Coding, and Symbol Search can provide more information about a child's mental rotation processes.

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Coding Rotation Errors (Cdre)

- Coding Rotation Errors-are unusual errors in which the child rotates a response. These might reflect the effect of responding too quickly unless there is a very high rate of rotations which could suggest some visual-perceptual issue. Also, review for consistency of the design rotated if random or always same 1 or 2.
- Utilize template to help determine rotational scores.

WISC-V

Coding Rotation Errors (Cdre)

A symbol is judged as rotated if the child's drawing is rotated ≥90° or more in either direction, relative to the keyed symbol.

The Coding Rotation Errors (CDre) Raw Score is obtained by summing the total number of symbols judged as rotated.

CDre (Form A: Max = 60) (Form B: Max = 104)
0

WISC-V

Symbol Search Rotation Errors (Ssre)

- Symbol Search Rotation Errors-the child marks distracters that are a rotated version of the target. These are rare errors and may indicate inattentive performance or impulsive responding related to speed but if occurring at high rate could signal a spatial perception problem.
- Symbol Search Set Error-The child marks a similar but incorrect symbol, parts similar or transposed but not rotated. May be an attentional or impulsivity issue due to trying to go quickly. If a lot of these errors could be visual or perceptual problem.
- Utilize template to help determine rotational/set scores

WISC-V

Symbol Search Rotation Errors (SSre)

- The Symbol Search Rotation Errors (SSre) Raw Score is the total number of rotation error symbols the child marked.
- If desired, sum the number of rotation error symbols marked on each page in the Response Booklet, and transfer the total to the Record Form.

SSre (Form A: Max = 20) (Form B: Max = 30)
1

WISC-V

Symbol Search Rotation Errors: Scoring

SSre: On the Symbol Search Scoring Key, the rotation error symbol is indicated with an R beneath the relevant error symbol.

WISC-V

Symbol Search Set Errors (SSse)

Some items contain a symbol in the search group that shares similar characteristics with the target symbol (i.e., a set error symbol).

- Set error scores for Symbol Search are based on selections of incorrect responses on Symbol Search.
- Sets of symbols were developed and judged to share similar physical characteristics by a panel of experts, using a Q-sort methodology.
- Unusual numbers of set errors may indicate impulsivity, lapses in attention, or visual perception issues.

Symbol Search Set Errors (SSse)

WISC-V

Some items contain a symbol in the search group that shares similar characteristics with the target symbol (i.e., a set error symbol).

On the Symbol Search Scoring Key, the set error symbol is indicated with an S beneath the relevant error symbol.

Error Scores: Naming Speed

WISC-V

- Naming Speed Literacy Error Scores (NSLes) - naming speed error rates are critical to the appropriate interpretation of performance on the naming speed measures.
- The naming speed tests assess the automaticity of access to language, if the child shows a high rate of misidentified objects, letters, or numbers then the skill is not automatic even if they have a relatively good speed of responding.

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Error Scores: Naming Speed

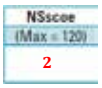
WISC-V

- These scores are presented as base rates for each of the individual measures. Missing just a couple could be an attentional issue; a lot of errors suggests issues with automaticity
- Naming Speed Color-Object Errors (Nscoe)
  - the number of times child gives wrong object name or color attributes
- Naming Speed Color-Object-Size Errors (NScose)
  - the number of times child gives wrong object name or color-size attributes
- Naming Speed Letter-Number Errors (NSlne)
  - the number of times child gives incorrect letter or number (track if one type of error more than the other)

Naming Speed Errors

WISC-V

- On the items for Naming Speed Literacy and Naming Speed Quantity, each misnamed attribute is considered an error.
- The examiner uses a slash mark to represent one error. In the example below, the child's response contains two errors that count toward the total number of errors for Item 2.



Error Scores: Naming Speed

WISC-V

- Children may self-correct at any time during administration. Self-corrections do not count as errors.
- Synonyms are acceptable (do not count as errors).
- Attributes may be named in any order.
- If "little yellow cow" is named as "big yellow car" – then it counts as 2 errors.
- Only report errors when a child commits an unusual number of errors - considered as a base rate of <10%

Error Scores: Naming Speed

WISC-V

- Naming Speed Quantity Errors (NSQe) the number of times a child misidentifies the number of objects in a set. It is very important to use the quantity error score when interpreting overall performance.
- The time score may be very fast but a high rate of errors suggests that immediate quantity recognition is not automatic.
  - A couple of errors may be related to attentional issues but a high rate suggests difficulties with quantity recognition.

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Deriving Base Rates

- Raw score for Longest Span and Sequence tasks and for Error Scores are converted to base rates.
- For base rates, refer to Tables C.17 and C.18 in the WISC–V Administration and Scoring Manual Supplement.

Raw Score to Base Rate Conversion

Process Score	Raw Score	Base Rate
Coding Rotation Errors (CDre)	0	
Symbol Search Set Errors (SSse)	0	
Symbol Search Rotation Errors (SSre)	1	≤5%
Naming Speed Literacy Errors (NSLe)	2	>25%
Naming Speed Color–Object Errors (NSlcoe)		
Naming Speed Size–Color–Object Errors (NSlscoe)	2	≤25%
Naming Speed Letter–Number Errors (NSlne)	0	
Naming Speed Quantity Errors (NSQe)	1	≤10%

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Process Analysis

Total Raw Score to Base Rate Conversion

Process Score		Raw Score	Base Rate
Longest Digit Span Forward	LDSf	5	88.1%
Longest Digit Span Backward	LDSb	3	91.5%
Longest Digit Span Sequence	LDSs	4	84.5%
Longest Picture Span Stimulus	LPSs	-	-
Longest Picture Span Response	LPSr	-	-
Longest Letter-Number Sequence	LLNs	3	95.1%
Block Design Dimension Errors	BDde	0	>25%
Block Design Rotation Errors	BDre	0	<=15%
Coding Rotation Errors	CDre	-	-
Symbol Search Set Errors	SSse	-	-
Symbol Search Rotation Errors	SSre	-	-
Naming Speed Literacy Errors	NSLe	0	>25%
Naming Speed Quantity Errors	NSQe	2	<=2%

Base rates are reported by overall sample for the span and sequence scores and by age group for the error scores.

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Complementary Analysis – Step 12

Index Level Pairwise Difference Comparisons

Index Comparison	Score 1	Score 2	Difference	Critical Value	Significant Difference	Base Rate
Complementary						
NSI - STI	78	106	-28	11.38	Y	5.7%

Statistical significance (critical values) at the .05 level.
Base rates are reported by overall sample.

Subtest Level Pairwise Difference Comparisons

Subtest Comparison	Score 1	Score 2	Difference	Critical Value	Significant Difference	Base Rate
Complementary						
NSL - NSQ	79	81	-2	16.19	N	46.0%
IST - DST	105	107	-2	14.49	N	40.9%
IST - RST	105	107	-2	17.49	N	41.0%
DST - RST	107	107	0	16.99	N	

Statistical significance (critical values) at the .05 level.
Base rates are reported by overall sample.

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WISC-V Process Observations

- Raw process scores based on examiner's observations
- Testing behaviors provide insight into cognitive and motivational processes such as active engagement, as well as the ability to understand and perform what is expected.
- Compared to base rates in Appendix D of Technical Manual (pages 232-235)
  - "Don't Know" Responses
  - No Responses
  - Item Repetitions
  - Requested Repetitions
  - Subvocalizations
  - Self-Corrections

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Process Observations

Process observations are raw process scores that are based on an examiner's observations of testing behaviors during subtest administration.

See Chapter 2 of the Administration and Scoring manual for instructions on recording and calculating each process observation raw score.

The Record Form does not provide specific space for this within each subtest.

See Appendix D of the WISC–V Technical and Interpretive Manual for tables to convert the process observation raw scores to base rates.

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Table 1.7 Subtests With Base Rates for Process Observations

Subtest	Don't Know	No Response	Item Repetition	Requested Repetition	Sub-Vocalization	Self-Correction
Similarities	✓	✓	✓			
Vocabulary	✓	✓	✓			
Information	✓	✓	✓			
Comprehension	✓	✓	✓			
Visual Puzzles	✓	✓			✓	✓
Matrix Reasoning	✓	✓			✓	✓
Figure Weights	✓	✓			✓	✓
Picture Concepts	✓	✓			✓	✓
Arithmetic	✓	✓	✓*		✓	✓
Digit Span				✓		✓
Picture Span	✓	✓			✓	✓
Letter–Number Sequencing				✓		✓
Naming Speed Literacy						✓
Naming Speed Quantity						✓
Recognition Symbol Translation	✓	✓				

*Item repetitions for Arithmetic are only permitted on items 20–34.

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Contrast Scores

- Hypothesis Driven
- Index level – Are there particular cognitive strengths and weaknesses related to the specific referral question(s) (e.g., slow processing speed, low verbal skills, etc…)
- Subtest level- Is there consistency of an observed deficit within a domain or across the entire battery
- Within subtest level, is there a specific cognitive difficulty impacting test performance
- Variability occurs frequently in clinical and non-clinical populations, the presence of significant variability may actually rule out a specific diagnosis (e.g., ID).

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Comparing Scores: Contrast Scores

- Contrast scores-form of regression that are not reliant on having a linear relationship across prediction line.
- Doesn't ask about a difference between scores but rather asks is "y" low or high, given "x".
- Must be a clear hierarchy between the variables (e.g., DSb Controlling for DSf) such that a directional comparison is important
- Controls for ability level effects

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Contrast Scores

- A different way of looking at discrepancies between scores while taking the child's level of performance into account
- 6 Contrast Scores are available on the WISC-V
- Use Appendix C on the WISC-V Technical and Interpretive Manual to derive the Contrast Scores.

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Contrast Scores

- DSf vs DSb
- DSf vs DSs
- DSs vs L-NS
- Cas vs CAr
- IST vs DST
- RST vs DST
- A contrast score answers a specific question between related measures. It indicates whether the score of interest is high or low considering (i.e., controlling for) performance on the control variable, the baseline score.

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DSb Performance by DSf Level

	DSF Scaled Score														
DSF	1-3	4	5	6	7	8	9	10	11	12	13	14	15	16	17-19
Mean DSB	5.6	6.9	8.1	8.5	8.7	9.5	9.6	10.0	10.5	10.5	11.1	11.1	12.9	13.0	13.3
SD	3.2	2.8	2.9	2.4	2.6	2.4	2.7	2.6	2.4	2.7	3.1	3.2	3.0	3.1	3.5

Regression to the mean…

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Questions?

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