Introducing WISC-V Integrated
Anise Flowers, Ph.D. & Gail C. Rodin, PhD
Assessment Consultant/Pearson

South Texas Assessment Consultant
Anise Flowers, Ph.D.
anise.flowers@pearson.com
936-321-7663

Objectives
Describe process-oriented assessment
Describe WISC-V Integrated
Illustrate clinical utility of WISC-V Integrated

Agenda
• Introduction to process-oriented assessment
• Application of process assessment to WISC-V results
• Overview of WISC-V Integrated
• Content of WISC-V Integrated
• Case study
• Practical recommendations for using WISC-V Integrated
  • Top Ten Lists

Purpose of WISC-V Integrated
• Assess cognitive ability and problem-solving processes
  of individuals ages 6:0 – 16:11
• Help clinician understand how individual learns
• Facilitate interpretation of low scores on WISC-V subtests

Everything Old is New Again . . .

Careful, systematic observation of a child’s problem-solving strategy (process)
can yield richer and more useful information
about cognitive functioning
than simple right-wrong scoring
of their final solution (product).

Heinz Werner (1937)
Process and Achievement: A Basic Problem
of Education and Developmental Psychology

Greatest Hits of Process-Oriented Assessment
• Boston Naming Test (1983)
• California Verbal Learning Test/-II (1987/2000)
• CVLT–Children’s Version (1994)
• WAIS-R as a Neuropsychological Instrument (WAIS-RNI) (1991)
• WISC-IV Integrated (2004)
• D-KEFS (2001)
• PAL-II Reading and Writing & PAL-II Math (2007)
**WISC-V Integrated**

**Boston Process Approach**

Edith Kaplan

Qualitative Evaluation of Test Performance

Quantitative Evaluation of Scores

**Utility of Process Scores & Process Analysis**

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

**WISC-V Integrated: The Best of Both Worlds**

**Product “What?”**

- Quantitative
- Level of Performance
- Scores
- Norm-referenced

**Process “Why?”**

- Qualitative/Quantitative
- Nature of Behaviors
- Strategies
- Correlates with brain function

**Assumptions of Process-Oriented Approach**

Any one factor – or combination of factors – may contribute to child's performance on a task

Same score can result from weakness in different cognitive abilities

**Interpretation of Scores on WISC-V VCI Subtests**

- High VCI scores indicate:
  - Well-developed verbal reasoning system
    - Strong word knowledge acquisition
    - Effective information retrieval
    - Good ability to reason and solve verbal problems
    - Effective communication of knowledge

- Low VCI scores may occur due to:
  - Poorly developed word knowledge
  - Difficulty retrieving acquired information
  - Problems with verbal expression
  - General difficulties with reasoning and problem solving

**Interpretation of Scores on WISC-V PSI Subtests**

- High PSI scores indicate:
  - Well-developed ability to:
    - Rapidly identify visual information
    - Make quick and accurate decisions
    - Rapidly implement those decisions

- Low PSI scores may occur due to:
  - Visual discrimination problems
  - Distractibility
  - Slowed decision making
  - Motor difficulties
  - General slow cognitive speed

Anise Flowers, Ph.D.
Gail Rodin, Ph.D.
 Pearson Clinical Assessment
Putting the Process Approach to Work

- Process-oriented approach attempts to identify cognitive sub-processes contributing to score
  For example, for Vocabulary:
  - Receptive language problem
  - Difficulty understanding directions, stimulus words
  - Lack of word knowledge
  - Difficulty accessing mental lexicon
    - Problems with retrieval from long-term storage
  - Expressive language problem

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 Edith Kaplan’s Boston approach to neuropsychological assessment, which emphasizes the qualitative evaluation of test performance (WISC-V Tech manual – page 17)

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 standard 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

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

<table>
<thead>
<tr>
<th>Scaled or Standard Process Score</th>
<th>Abbreviation</th>
<th>Score Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block Design No Time Bonus</td>
<td>BDn</td>
<td>Scaled</td>
</tr>
<tr>
<td>Block Design Partial Score</td>
<td>BDp</td>
<td>Scaled</td>
</tr>
<tr>
<td>Digit Span Forward</td>
<td>DSF</td>
<td>Scaled</td>
</tr>
<tr>
<td>Digit Span Backward</td>
<td>DSB</td>
<td>Scaled</td>
</tr>
<tr>
<td>Digit Span Sequencing</td>
<td>DSs</td>
<td>Scaled</td>
</tr>
<tr>
<td>Cancellation Random</td>
<td>CA</td>
<td>Scaled</td>
</tr>
<tr>
<td>Cancellation Structured</td>
<td>CAS</td>
<td>Scaled</td>
</tr>
<tr>
<td>Naming Speed Color-Object</td>
<td>NSo</td>
<td>Standard</td>
</tr>
<tr>
<td>Naming Speed Size-Color-Object</td>
<td>NSsco</td>
<td>Standard</td>
</tr>
<tr>
<td>Naming Speed Letter-Number</td>
<td>NSn</td>
<td>Standard</td>
</tr>
</tbody>
</table>

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 Scaled Score – assesses the impact of slower performance speed on overall Block Design Score – specifically did slow processing affect the child’s estimated performance?
- Those who score low on BD but not on BDn may have adequate visual-spatial abilities that require additional time to process (may be anxious).

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.

<table>
<thead>
<tr>
<th>BDn</th>
<th>Items 1-3: Score 0-2 points. Items 4-12: Score 0-4 points</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total 2</td>
</tr>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td>BDn (Max = 48)</td>
<td>Total</td>
</tr>
</tbody>
</table>
Process Scores: Block Design

- Block Design Partial Scaled Score
- Assesses the child’s ability to complete portions of the full design.
- Some children fail whole items due to missing one or 2 blocks but in general show good spatial skills.
- Reduces the emphasis on speed, providing partial credit to children for blocks placed correctly within the time limit.
- Reduces the emphasis on attention to detail, as credit is awarded for any part of the design that is constructed correctly.

Process Scores: Digit Span

- 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 better than forward (e.g., procedural learning, more focused attention, better effort, etc.)
- Digit Span Sequencing: additional working memory 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

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

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.

Digit Span

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

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

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

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
  - Since CAS follows CAR the examinee has an opportunity to better understand the rules and can alter their approach to the tasks based on the performance on CAR
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.

<table>
<thead>
<tr>
<th>Item</th>
<th>CAR/Raw Score</th>
<th>CAs/Raw Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>2.</td>
<td>28</td>
<td>28</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Process Score</th>
<th>Item</th>
<th>Ages</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSco</td>
<td>1</td>
<td>6-8 years</td>
</tr>
<tr>
<td>NSsco</td>
<td>2</td>
<td>6-8 years</td>
</tr>
<tr>
<td>NSln</td>
<td>3</td>
<td>7-8 years</td>
</tr>
</tbody>
</table>

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.

Namings 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).

\[
\text{Ages 7-8} \quad 108 + 41 = 149 \quad \text{(Max = 1200)}
\]

Process Analysis – Step 11

Score Report

<table>
<thead>
<tr>
<th>Process Score Comparison</th>
<th>Score 1</th>
<th>Score 2</th>
<th>Difference</th>
<th>Critical Value</th>
<th>Significant Difference</th>
<th>Base Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD – EDs</td>
<td>11</td>
<td>10</td>
<td>1</td>
<td>3.40</td>
<td>N</td>
<td>17.1%</td>
</tr>
<tr>
<td>BD – BDp</td>
<td>11</td>
<td>14</td>
<td>-3</td>
<td>-1.11</td>
<td>N</td>
<td>5.4%</td>
</tr>
<tr>
<td>2SF-2SH</td>
<td>7</td>
<td>6</td>
<td>1</td>
<td>3.60</td>
<td>N</td>
<td>41.3%</td>
</tr>
<tr>
<td>2SF-2SH</td>
<td>7</td>
<td>7</td>
<td>0</td>
<td>1.63</td>
<td>N</td>
<td>0%</td>
</tr>
<tr>
<td>2SF-2SH</td>
<td>6</td>
<td>7</td>
<td>-1</td>
<td>3.66</td>
<td>N</td>
<td>42.0%</td>
</tr>
<tr>
<td>2SF-2SH</td>
<td>7</td>
<td>7</td>
<td>0</td>
<td>1.38</td>
<td>N</td>
<td>12.0%</td>
</tr>
<tr>
<td>CAs-CAs</td>
<td>10</td>
<td>10</td>
<td>0</td>
<td>0.90</td>
<td>N</td>
<td>0%</td>
</tr>
</tbody>
</table>

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

Raw Process Scores

<table>
<thead>
<tr>
<th>Longest Span and Sequence</th>
<th>Error Scores</th>
<th>Process Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum performance on a span task</td>
<td>Tally of the number of times a certain type of error is committed during a subtest or an item</td>
<td>Tally of the number of times a certain behavior is observed during a subtest</td>
</tr>
</tbody>
</table>

Longest Span and Sequence Scores

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).
### Longest Span and Sequence Score

<table>
<thead>
<tr>
<th>Longest Span and Sequence Score</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Longest Digit Span Forward</td>
<td>LDSf</td>
</tr>
<tr>
<td>Longest Digit Span Backward</td>
<td>LDSb</td>
</tr>
<tr>
<td>Longest Digit Span Sequence</td>
<td>LDSs</td>
</tr>
<tr>
<td>Longest Picture Span Stimulus</td>
<td>LPSs</td>
</tr>
<tr>
<td>Longest Picture Span Response</td>
<td>LPSr</td>
</tr>
<tr>
<td>Longest Letter–Number Sequence</td>
<td>LLNs</td>
</tr>
</tbody>
</table>

### Process Scores: Digit Span
- **Longest Span** measures the consistency of performance on a given trial.
- These raw scores reflect the number of digits recalled on the last trial scored 1 point in the corresponding Digit Span task.
- High span versus low scaled score suggests inconsistency, possible attention issues, or possible effort problems.
- Reported as based rates
  - Digit Span Forward Longest Span (LDSf)
  - Digit Span Backward Longest Span (LDSb)
  - Digit Span Sequencing Longest Span (LDSs)

### Process Scores: Picture Span
- Picture Span Longest Stimulus (LPSs) - the maximum number of stimuli 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.

### Longest Letter–Number Sequence Scores
- 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.

### Deriving Base Rates
- 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.
- 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.
Error Scores

- 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 mislabeled 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.

Error Scores: Block Design

- Block Design Dimension Errors
  - 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 (details) information processing.
  - Individuals that get too focused on the design elements may make configuration errors – rarely 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 Dimension Error (BDe)

- 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.
- Record a D next to the grid in the Constructed Design column.

Error Scores: Block Design

- Block Design Rotation Errors
  - 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.

Rotation Errors

- 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.
Block Design Rotation Errors (BDre)

Rotation Error: A pronounced rotation of 30° or more in the child’s construction at the time limit.

Error Scores: Coding

- Coding Rotation Errors
  - Unusual errors in which the child rotates a response.
  - 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 one or two designs.
- Utilize template to help determine rotational scores.

Coding Rotation Errors

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.

Symbol Search Rotation Errors

- 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.

Error Scores: Symbol Search

- Symbol Search Rotation Errors
  - Child marks distracters that are a rotated version of the target.
  - 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
  - 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

Symbol Search Rotation Errors: Scoring

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

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

- Naming Speed Color-Object Errors
  - number of times child gives wrong object name or color attributes
- Naming Speed Color-Object-Size Errors
  - number of times child gives wrong object name or color-size attributes
- Naming Speed Letter-Number Errors
  - number of times child gives incorrect letter or number (track if one more than the other)

Error Scores: Naming Speed

- Naming Speed Quantity Errors
  - Number of times a child misidentifies the number of objects in a set
  - Very important to use the quantity error score when interpreting overall performance
  - 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.

Error Scores: Naming Speed

- Naming Speed Literacy Error Score(s)
  - Naming speed error rates are critical to the appropriate interpretation of performance on the naming speed measures
  - 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.
  - These scores are presented as base rates for each of the individual measures.
  - Missing just a couple could be attentional issue
  - A lot of errors suggests issues with automaticity

Naming Speed Errors

- 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

- Children may self-correct during 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.
- If a child misnames two consecutive elements in a single row, point to the second misnamed element and say, “Keep going from here” – do not stop timing.
- Only report errors when a child commits an unusual number of errors - considered as a base rate of <10%

Anise Flowers, Ph.D.
Gail Rodin, Ph.D.
Pearson Clinical Assessment
Summary: Interpretation of Rotation Errors

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.

Deriving Base Rates

- Raw 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.

Process Analysis – Step 12

<table>
<thead>
<tr>
<th>Total Raw Score to Base Rate Conversion</th>
<th>Raw Score</th>
<th>Base Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Longest Digit Span Forward LDISh</td>
<td>9</td>
<td>80.1%</td>
</tr>
<tr>
<td>Longest Digit Span Backward LDISb</td>
<td>3</td>
<td>91.9%</td>
</tr>
<tr>
<td>Longest Digit Span Sequences LDSx</td>
<td>6</td>
<td>54.5%</td>
</tr>
<tr>
<td>Longest Picture Span-Word LPSx</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Longest Picture Span Response LPRx</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Longest Letter/Number Sequence LLSx</td>
<td>3</td>
<td>93.1%</td>
</tr>
<tr>
<td>Block Design Dimension Errors BDEr</td>
<td>0</td>
<td>≥15%</td>
</tr>
<tr>
<td>Block Design Rotation Errors BDRx</td>
<td>0</td>
<td>&lt;15%</td>
</tr>
<tr>
<td>Coding Rotation Errors CRx</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Syntactic Sent Errors Syx</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Syntactic Sentence Errors Syx</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Naming Speed Literal Errors NSLx</td>
<td>0</td>
<td>&gt;25%</td>
</tr>
<tr>
<td>Naming Speed Quantity Errors NSQx</td>
<td>2</td>
<td>&lt;25%</td>
</tr>
</tbody>
</table>

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

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

Index Level Pairwise Difference Comparisons

<table>
<thead>
<tr>
<th>Subtest Comparison</th>
<th>Score 1</th>
<th>Score 2</th>
<th>Difference</th>
<th>Critical Value</th>
<th>Significant Difference</th>
<th>Base Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complementary</td>
<td>94</td>
<td>106</td>
<td>-22</td>
<td>13.40</td>
<td>N</td>
<td>49.0%</td>
</tr>
<tr>
<td>BST - BST</td>
<td>107</td>
<td>107</td>
<td>0</td>
<td>16.00</td>
<td>N</td>
<td>61.6%</td>
</tr>
</tbody>
</table>

Note: Significant difference (critical values) at the .05 level.

Table 1.7 Subtests With Base Rates for Process Observations

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Don’t Know</th>
<th>No Response</th>
<th>Item Repetition</th>
<th>Requested Repetition</th>
<th>Subvocalization</th>
<th>Self-Corrections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auditory</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Comprehension</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Visual Processing</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Figure Weights</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Fraction Concepts</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Arithmetic</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Digit Span</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Picture Span</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Letter-Number Sequencing</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Naming Speed</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Naming Speed Quantity</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Recognition</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Similar Figures</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Note: Some subtests are only administered on Tests 20–34.
Comparing 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).

Comparing Scores: Contrast Scores

- Contrast scores
  - Form of regression not reliant on having a linear relationship across prediction line.
- Doesn’t ask about a difference between scores but 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

Deriving Contrast Scores

Appendix C – Interpretive Manual

DSb Performance by DSf Level

<table>
<thead>
<tr>
<th>DSf</th>
<th>1-3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17-19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>5.6</td>
<td>6.9</td>
<td>8.1</td>
<td>8.5</td>
<td>9.5</td>
<td>9.6</td>
<td>10.0</td>
<td>10.5</td>
<td>10.5</td>
<td>11.1</td>
<td>11.1</td>
<td>12.9</td>
<td>13.0</td>
<td>13.3</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>3.2</td>
<td>2.8</td>
<td>2.9</td>
<td>2.4</td>
<td>2.6</td>
<td>2.7</td>
<td>2.6</td>
<td>2.4</td>
<td>2.7</td>
<td>3.1</td>
<td>3.2</td>
<td>3.0</td>
<td>3.1</td>
<td>3.5</td>
<td></td>
</tr>
</tbody>
</table>

Interpreting Contrast Scores

DSf vs. DSb Interpretive Summary

See Appendix C (pages 209-229) in the WISC-V Technical and Interpretive Manual.
WISC-V Integrated

WISC-V Integrated Process Subtests

- 14 optional process subtests
  - 8 adaptations
  - 2 variations
  - 4 expansions/extensions

Adaptations

Same item content as corresponding primary or secondary WISC-V subtest, with modifications to mode of presentation, response format, or item administration

Variations

Novel item content and modifications to mode of presentation, response format, or item administration

Expansions/Extensions

Expand scope of construct coverage and provide information related to child’s performance on other subtests

Testing the Limits

- Psychologists often test clinical limits
  - To help identify learning differences that may be missed in global summary scores
  - To determine ways to improve performance
- WISC-V Integrated standardizes this process
  - Allows comparison of performance – and changes in performance from one task format to another – with that of a normative sample
Does Test Format Matter?

“The precise format by which vocabulary knowledge is measured generally makes little difference in the factorial composition of the variables to the extent that the underlying trait being measured is range of native language vocabulary knowledge.”


Does Test Format Matter for Ryan?

<table>
<thead>
<tr>
<th>TEST/SUBTEST</th>
<th>RAW SCORE</th>
<th>SCALED SCORE</th>
<th>LAST ITEM CREDITED</th>
</tr>
</thead>
<tbody>
<tr>
<td>WISC-V Vocabulary</td>
<td>19</td>
<td>7</td>
<td>#22</td>
</tr>
<tr>
<td>WISC-V Integrated</td>
<td>34</td>
<td>11</td>
<td>#26</td>
</tr>
</tbody>
</table>

# Improved responses (1 → 2) = 7
# Corrected responses (0 → 1, 2) = 7

Standardized Testing of Limits

Ryan scored 4 points higher on Vocabulary Multiple Choice than he did on Vocabulary (11 vs. 7)

• Is this difference significant? Yes

Table B.2 tells me:
• A VC – VCMC difference of 3.18 points is needed for significance at p = .05

Process Subtest Selection

• Don’t use all processing subtests/procedures with every child

• Select based upon:
  • Referral questions
  • Observations made during core assessment
  • Need to collect confirmatory data

Anise Flowers, Ph.D.
Gail Rodin, Ph.D.
Pearson Clinical Assessment
Verbal Multiple Choice Subtests

• Similarities Multiple Choice
• Vocabulary Multiple Choice
• Picture Vocabulary Multiple Choice
• Information Multiple Choice
• Comprehension Multiple Choice

Similarities Multiple Choice (SIMC)

• A multiple-choice adaptation of WISC–V Similarities subtest
  • Each item and its response options are both:
    • Presented visually
    • Read aloud
  • Child selects response option that best represents how common objects or concepts are similar
• Response options include:
  • 2-point response
  • 1-point response
  • Several 0-point responses

Vocabulary Multiple Choice (VCMC)

• A multiple-choice adaptation of WISC–V Vocabulary subtest
  • For picture items, child views pictures and selects best response from options read aloud
  • For verbal items, each item and its response options are presented visually and read aloud
  • Child selects response option that best represents definition of the word

Multiple Choice Verbal Comprehension Index (MCVCI)

• Derived from sum of two scaled scores:
  • Similarities Multiple Choice (SIMC)
  • Vocabulary Multiple Choice (VCMC)
• May be compared to VCI from WISC-V

Picture Vocabulary Multiple Choice (PVMC)

• A pictorial multiple-choice adaptation of WISC–V Vocabulary subtest
  • Child views four pictures and selects picture that best depicts definition of orally-presented word

• All use frequently given correct and incorrect responses from related WISC-V subtest
• Similarities MC, Vocabulary MC, and Comprehension MC scored 2/1/0 points
  • As with related WISC-V subtests
  • Picture Vocabulary MC and Information MC scored 1/0
• Rationale is that Integrated subtests remove need for:
  • Recalling information from long-term storage
  • Using expressive language
Information Multiple Choice (INMC)

- A multiple-choice adaptation of WISC–V Information
- Each item and its response options presented visually and read aloud
- Child selects response option that best represents an understanding of general knowledge topic

Comprehension Multiple Choice (COMC)

- A multiple-choice adaptation of WISC–V Comprehension
- Each item and its response options presented visually and read aloud
- Child selects response option that best represents an understanding of general principle or social situation

Block Design Multiple Choice (BDMC)

- A multiple-choice variation of WISC–V Block Design
- Child views picture of constructed block design and selects pictured block set that produces matching composition
- Like Block Design, has time limits
- Assesses visual integration and mental construction skills without influence of motor planning/execution

Figure Weights Process Approach (FWP)

- An adaptation of WISC–V Figure Weights subtest in which the child is given additional time to respond
- Within extended time limit, child is re-administered Figure Weights items previously scored 0 points

Arithmetic Process Approach (ARP)

- An adaptation of WISC–V Arithmetic subtest
- Arithmetic items 6 – 34 presented in multiple modalities for child to solve within specified time limit
  - Part A – Arithmetic items on which child scored 0 points presented visually and simultaneously read aloud
    - Greatly reduces working memory demands
  - Part B – Child is provided paper and pencil, and is re-administered items scored 0 points in Part A
    - Further reduces demands on working memory

Written Arithmetic (WA)

- An adaptation of WISC–V Arithmetic subtest
- Child is presented with mathematical computations for Arithmetic items and uses pencil and paper to complete them
Arithmetic Process Approach and Written Arithmetic

- Working Memory
- Math Skills

Performance on AR Subtest

Spatial Span (SSP)

- Expands WISC-V working memory construct coverage
- Composed of two tasks:
  - Spatial Span Forward – Child reproduces sequence of tapped blocks
  - Spatial Span Backward – Child reproduces sequence of tapped blocks in reverse order

Examples:

<table>
<thead>
<tr>
<th>Forward</th>
<th>Backward</th>
</tr>
</thead>
</table>

Visual Working Memory Index

- WISC-V Picture Span + WISC-V Integrated Spatial Span = Visual Working Memory Index
- Composite score can be compared to AWMI or other verbal working memory measures

Sentence Recall (SR)

- Items composed of two tasks:
  - Question task
  - Recall task
  - Question Task – Child responds “Yes” or “No” to one or more simple questions
  - Recall Task – Child recalls last word of each question, in order presented

Coding Recall (CDR)

- Expands scope of WISC-V Coding subtest
- Assesses incidental learning
- Administered immediately following administration of WISC-V Coding subtest
- Do not allow a break between Coding and Coding Recall
Coding Recall (CDR)
- Working within specified time limit and without a key, child attempts to remember corresponding pairs from Coding in multiple formats
- Assesses incidental learning using three formats:
  - Cued recall
  - Free recall
  - Pairing

Coding Copy (CDC)
- Expands scope of WISC-V Coding subtest
- Within specified time limit, child copies symbols used in Coding
- Allows examiner to assess impact of graphomotor speed on Coding performance
  - Low scores on Coding Copy: Slow graphomotor speed may have interfered with Coding performance
  - High scores on Coding Copy: More likely that poor visual scanning and/or incidental learning may have interfered with Coding performance

Cancellation Abstract (CAA)
- A variation of WISC-V Cancellation subtest
- Working within specified time limit, child scans two arrangements of shapes (one random, one structured) and marks target shapes

Subtest Scores
- Scores on 14 WISC-V process subtests reported as scaled scores
  - Mean = 10
  - SD = 3
- Scaled scores for process subtests are for comparison purposes only

Composite Scores

Other Scores
- Part scores, where it makes sense
  For example:
  - Spatial Span Forward
  - Spatial Span Backward
  - SSP Forward vs. Backward comparison
  - Arithmetic Process Approach Part A
  - Arithmetic Process Approach Part B
  - APR Part A vs. Part B comparison
- Longest span scores
Process Observations

• Same process observations as are available for WISC-V
  • Listed in Appendix D of Technical and Interpretive Manual

• Base rates for behaviors

Comparison Scores

• Discrepancy comparisons with WISC-V
  • Compare process scores with subtests
    • E.g., Vocabulary Multiple Choice with Vocabulary

• Compare composite scores where it makes sense
  • E.g., VCI vs. MCVCI

Case Study: Warren

Background Information

• Warren is in the 5th grade at Washington Elementary.
• He earned extremely low scores in reading and language arts on a standardized group achievement test administered in the early spring of his second grade year.

Background Information

• Since that time, Warren has been receiving educational support services through district remediation programs.
• Consistent with the regular classroom whole language instructional program, the remedial program emphasizes improvement of reading comprehension skills rather than a systematic approach to word decoding skill development.

Warren – Age 10:5, Grade 5

<table>
<thead>
<tr>
<th>WISC-V Index/Subtest</th>
<th>Composite Score/ Scaled Score</th>
<th>WISC-V Index/Subtest</th>
<th>Composite Score/ Scaled Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>VCI</td>
<td>76</td>
<td>WMF</td>
<td>88</td>
</tr>
<tr>
<td>Similarities</td>
<td>6</td>
<td>Digit Span</td>
<td>6</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>5</td>
<td>Picture Span</td>
<td>10</td>
</tr>
<tr>
<td>Information</td>
<td>(7)</td>
<td>(Letter-Number Seq.)</td>
<td>(5)</td>
</tr>
<tr>
<td>Comprehension</td>
<td>(6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VSI</td>
<td>86</td>
<td>PSI</td>
<td>86</td>
</tr>
<tr>
<td>Block Design</td>
<td>5</td>
<td>Coding</td>
<td>5</td>
</tr>
<tr>
<td>Visual Puzzles</td>
<td>10</td>
<td>Symbol Search</td>
<td>10</td>
</tr>
<tr>
<td>(Cancellation)</td>
<td></td>
<td></td>
<td>(9)</td>
</tr>
<tr>
<td>FRI</td>
<td>102</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Matrix Reasoning</td>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Figure Weights</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Picture Concepts)</td>
<td>(9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Arithmetic)</td>
<td>(12)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Full Scale IQ 77
Anise Flowers, Ph.D.
Gail Rodin, Ph.D.
Pearson Clinical Assessment
Addition of WISC-V Integrated

<table>
<thead>
<tr>
<th>WISC-V Subtest</th>
<th>WISC-V Integrated Subtest</th>
<th>Scaled Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Similarities</td>
<td>Similarities Multiple Choice</td>
<td>6  12</td>
</tr>
<tr>
<td>Comprehension</td>
<td>Comprehension Multiple Choice</td>
<td>6  15</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>Vocabulary Multiple Choice</td>
<td>5  10</td>
</tr>
<tr>
<td>Information</td>
<td>Information Multiple Choice</td>
<td>7  7</td>
</tr>
<tr>
<td>Block Design</td>
<td>Block Design Multiple Choice</td>
<td>5  10</td>
</tr>
<tr>
<td>Ogt Span</td>
<td>Spatial Span</td>
<td>6  10</td>
</tr>
<tr>
<td>Coding</td>
<td>Coding Copy</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Coding Recall</td>
<td>10</td>
</tr>
</tbody>
</table>

Test Results Achievement

<table>
<thead>
<tr>
<th>Composite</th>
<th>Standard Score</th>
<th>95% Conf Interval</th>
<th>%ile Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Reading</td>
<td>69</td>
<td>65–73</td>
<td>2</td>
</tr>
<tr>
<td>Basic Reading</td>
<td>63</td>
<td>59–67</td>
<td>1</td>
</tr>
<tr>
<td>Reading Comprehension and Fluency</td>
<td>75</td>
<td>68–82</td>
<td>5</td>
</tr>
<tr>
<td>Mathematics</td>
<td>104</td>
<td>97–111</td>
<td>61</td>
</tr>
<tr>
<td>Math Fluency</td>
<td>116</td>
<td>109–123</td>
<td>86</td>
</tr>
</tbody>
</table>

WIAT-III Composite Score Summary

Ability and Achievement

- Student’s achievement in math is consistent with his average FRI score on the WISC-V.
- His low reading scores are consistent with his lower VCI score on the WISC-V.
- He demonstrates difficulties across the spectrum of reading skills. His performance is typical of students with specific reading disorders.
- He is unable to integrate the phonetic and orthographic features of words so that his difficulties with decoding also affect his spelling (encoding).

Additional Evaluations

- Speech-Language: Severe Expressive Language Disorder
- Visual-Motor Integration: Performance in Low range (Refer for OT evaluation)
Summary of Findings

• Overall, results of the WISC–IV Integrated suggest that the impression that Warren has limited verbal intelligence is partly because he has considerable difficulty expressing himself in words at an age-appropriate level, and partly because his reading difficulties may impede the acquisition of new verbal knowledge.

• When verbal material and interactions are more structured, such as with multiple-choice paradigms, Warren has a better opportunity to reveal his verbal reasoning abilities and knowledge.

Recommendations

• Speech services to help improve Warren’s ability to express his thoughts effectively in class.

• Occupational therapy services to help improve his visual-motor skills.

• Remedial reading instruction specifically designed to address his severe word recognition difficulties.

• Books on tape to help him use his effective listening skills to keep up with content typically addressed through independent reading assignments.

• Test-taking accommodations that would enable Warren to have test questions read to him.

Classroom Accommodations

Through the discussion of the assessment results, his teacher arrived at the insight that rather than asking Warren specific questions about what he had retained from a lesson, she would ask a question and provide two or more alternative answers from which he could choose.

Top Ten WISC-V Integrated Process Subtests

1. Similarities Multiple Choice
2. Vocabulary Multiple Choice
3. Comprehension Multiple Choice
4. Information Multiple Choice
5. Block Design Multiple Choice
6. Arithmetic Process Approach
7. Written Process Approach
8. Sentence Recall
9. Coding Recall
10. Coding Copy

Further Reading