The New WISC-V

The digital format on Q-interactive puts all the power of WISC-V at your fingertips. It’s user-friendly, efficient, and incredibly convenient.

WISC-V on Q-interactive:
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Presented: Peter C. Entwistle Ph.D.
The New WISC-V
WISC-V on Q-interactive: Digital update

- Targeting mid-late October 2014 publication date (same as p/p)
- PS subtests paper for initial launch of WISC-V on Q-interactive (Q-i v2.0)

Why?

We have not yet completed the data analyses necessary to support the digital version of these subtests which are required to uphold our high scientific standards.

Materials:

- Starter kit includes one packet each of Response Booklets 1 & 2
- Free reorders of RB 1 & 2 as needed
- Manuals hosted on Central

What’s next?

Development work continues to achieve vision of digital-only PS subtests. Timeline TBD based on findings.

Additional Updates

Pub date: Mid-late October; targeting paper/pencil, digital and profile/combination reports on Q-global

Pre-pub pricing: Extended through October 24, 2014

WISC-V training: Online training available with kit or Q-i purchase

Q-global: Subscription and pay-per-use pricing available; Call campaign and other marketing efforts to increase attachment rate

Slide decks: Posted by Amy on Share Point

WISC-V video: Over 3,200 view on YouTube

Banner stands: Available mid-late August

Brochure: Available at APA and in warehouse for fall workshops; eZINE being developed
Where and how is the WISC used in the clinical market?

One psychologist's experience.

Community Mental Health Center
- Training students
- ADHD / learning assessment
- Child abuse cases

Private practice
- CPS
- Private school admissions
- Medicaid referrals
- Referrals from neurologists/doctors for cognitive eval

State Hospital
Inpatient and residential unit for assessing education special needs

WISC-V: what you need to know:

- WISC-V Development Team:
  - Susie Raiford
  - Jim Holdnack
  - (Diane Coalson)
Update: WISC–V on Qi

- WISC-V 1.0, late October 2014
  - Equivalence study for all primary, secondary, and complementary subtests except Processing Speed, similar to the Qi WISC-IV technical report by Mark Daniel
  - Clinical studies (all subtests except Processing Speed): GT, IDMI, SLD-Reading, SLD-Mathematics, ADHD, Autism Spectrum Disorder
  - Paper response booklets for Processing Speed subtests; data entry screens similar to those of WISC-IV

- Meanwhile, meeting biweekly and working continually on Processing Speed subtests...

- WISC–V 2.0, pub date to be scheduled (ASAP)
  - Processing Speed subtests equated, digital adaptations
  - Clinical validity for post-equating

WISC–V on Q-interactive

- Starter kit
  - Welcome materials
  - Blocks
  - Response Booklets 1 and 2

- Access to the following supportive information on Q-central
  - In-app: Chapter 3 administration directions by subtest (i button)
  - WISC-V Administration and Scoring Manual
  - WISC-V Administration and Scoring Manual Supplement
  - WISC-V Qi-Specific Administration Information
  - WISC-V Technical and Interpretive Manual
  - WISC-V Technical and Interpretive Manual Supplement: Clinical validity studies and age-based correlations
  - WISC-V Technical Report 1: Equivalence study of traditional (paper/pencil) and Q-i versions
Reduced Testing Time

- Good news!
- 5 primary index scores: 65 minutes mean
  (10 minutes shorter than WISC-V mean)
- FSIQ: 48 minutes mean
  (27 minutes shorter than WISC-V mean)
- Shorter discontinue rules, fewer items, selecting subtests with
  briefer admin time to contribute to these scores

Subtest Types and Categories

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Score Type</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block Design</td>
<td>Scaled</td>
<td>Primary (FSIQ)</td>
</tr>
<tr>
<td>Similarities</td>
<td>Scaled</td>
<td>Primary (FSIQ)</td>
</tr>
<tr>
<td>Matrix Reasoning</td>
<td>Scaled</td>
<td>Primary (FSIQ)</td>
</tr>
<tr>
<td>Digit Span</td>
<td>Scaled</td>
<td>Primary (FSIQ)</td>
</tr>
<tr>
<td>Coding</td>
<td>Scaled</td>
<td>Primary (FSIQ)</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>Scaled</td>
<td>Primary (FSIQ)</td>
</tr>
<tr>
<td>Figure Weights</td>
<td>Scaled</td>
<td>Primary (FSIQ)</td>
</tr>
<tr>
<td>Visual Puzzles</td>
<td>Scaled</td>
<td>Primary</td>
</tr>
<tr>
<td>Picture Span</td>
<td>Scaled</td>
<td>Primary</td>
</tr>
<tr>
<td>Symbol Search</td>
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<td>Primary</td>
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### Subtest Types and Categories

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Score Type</th>
<th>Category</th>
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<tbody>
<tr>
<td>Information</td>
<td>Scaled</td>
<td>Secondary</td>
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<tr>
<td>Picture Concepts</td>
<td>Scaled</td>
<td>Secondary</td>
</tr>
<tr>
<td>Letter-Number Seq</td>
<td>Scaled</td>
<td>Secondary</td>
</tr>
<tr>
<td>Cancellation</td>
<td>Scaled</td>
<td>Secondary</td>
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<tr>
<td>Comprehension</td>
<td>Scaled</td>
<td>Secondary</td>
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<tr>
<td>Arithmetic</td>
<td>Scaled</td>
<td>Secondary</td>
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<thead>
<tr>
<th>Subtest</th>
<th>Score Type</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Naming Speed Literacy</td>
<td>Standard</td>
<td>Complementary</td>
</tr>
<tr>
<td>Naming Speed Quantity</td>
<td>Standard</td>
<td>Complementary</td>
</tr>
<tr>
<td>Immediate Symbol Translation</td>
<td>Standard</td>
<td>Complementary</td>
</tr>
<tr>
<td>Delayed Symbol Translation</td>
<td>Standard</td>
<td>Complementary</td>
</tr>
<tr>
<td>Recognition Symbol Translation</td>
<td>Standard</td>
<td>Complementary</td>
</tr>
</tbody>
</table>
Full Scale (FSIQ)

Full Scale

<table>
<thead>
<tr>
<th>Verbal Comprehension</th>
<th>Visual Spatial</th>
<th>Fluid Reasoning</th>
<th>Working Memory</th>
<th>Processing Speed</th>
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</thead>
<tbody>
<tr>
<td>Similarities</td>
<td>Block Design</td>
<td>Matrix Reasoning</td>
<td>Digit Span</td>
<td>Coding</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>Visual Puzzles</td>
<td>Figure Weights</td>
<td>Picture Span</td>
<td>Symbol Search</td>
</tr>
<tr>
<td>Information</td>
<td></td>
<td>Picture Concepts</td>
<td>Letter–Number</td>
<td>Cancellation</td>
</tr>
<tr>
<td>Comprehension</td>
<td></td>
<td>Arithmetic</td>
<td>Sequencing</td>
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</table>

Primary Index Scores

Primary Index Scales

<table>
<thead>
<tr>
<th>Verbal Comprehension</th>
<th>Visual Spatial</th>
<th>Fluid Reasoning</th>
<th>Working Memory</th>
<th>Processing Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Similarities</td>
<td>Block Design</td>
<td>Matrix Reasoning</td>
<td>Digit Span</td>
<td>Coding</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>Visual Puzzles</td>
<td>Figure Weights</td>
<td>Picture Span</td>
<td>Symbol Search</td>
</tr>
<tr>
<td>Information</td>
<td></td>
<td>Picture Concepts</td>
<td>Letter–Number</td>
<td>Cancellation</td>
</tr>
<tr>
<td>Comprehension</td>
<td></td>
<td>Arithmetic</td>
<td>Sequencing</td>
<td></td>
</tr>
</tbody>
</table>

VCI  VSI  FRI  WMI  PSI

Perceptual Reasoning Index (PRI)
Replaced
Complementary Index Scores

Complementary Index Scales

- Naming Speed
- Naming Speed Literacy
- Naming Speed Quantity

- Symbol Translation
  - Immediate Symbol Translation
  - Delayed Symbol Translation
  - Recognition Symbol Translation

- Storage and Retrieval
  - Naming Speed Index
  - Symbol Translation Index

NSI  STI  SRI
On Record Form Analysis Pages and in Administration and Scoring Manual Supplement: Optional carry-along

WISC-V Test Framework

Primary Index Scales

- Full Scale
- Visual Spatial
  - Block Design
  - Visual Puzzles

- Fluid Reasoning
  - Matrix Reasoning
  - Figure Weights
  - Picture Concepts

- Working Memory
  - Digit Span
  - Letter-Number Sequencing

- Processing Speed
  - Coding
  - Symbol Search

Ancillary Index Scales

- Quantitative Reasoning
  - Picture Weights
  - Arithmetic

- Working Memory
  - Digit Span
  - Letter-Number Sequencing

- General Ability
  - Matrix Reasoning
  - Matrix Weights
  - Picture Span

- Cognitive Efficiency
  - Digit Span
  - Picture Span

Complementary Index Scales

- Symbol Translation
- Immediate Symbol Translation
- Delayed Symbol Translation
- Recognition Symbol Translation

- Storage and Retrieval
- Naming Speed Index
- Symbol Translation Index
Substitution and Proration = No More “Core” and “Supplemental”

- Only one sub OR pro on FSIQ
- No subs or pros on any index score
- Less necessary with the expanded composite score options

<table>
<thead>
<tr>
<th>FSIQ Subtest</th>
<th>Allowable Substitutions for Deriving the FSIQ*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Similarities</td>
<td>Information or Comprehension</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>Information or Comprehension</td>
</tr>
<tr>
<td>Block Design</td>
<td>Visual Puzzles</td>
</tr>
<tr>
<td>Matrix Reasoning</td>
<td>Picture Concepts</td>
</tr>
<tr>
<td>Figure Weights</td>
<td>Picture Concepts or Arithmetic</td>
</tr>
<tr>
<td>Digit Span</td>
<td>Picture Span or Letter–Number Sequencing</td>
</tr>
<tr>
<td>Coding</td>
<td>Symbol Search or Cancellation</td>
</tr>
</tbody>
</table>

Descriptive Classifications

<table>
<thead>
<tr>
<th>Composite Score Range</th>
<th>WISC–V Descriptive Classification</th>
<th>Traditional Descriptive Classification (“Old”)</th>
</tr>
</thead>
<tbody>
<tr>
<td>130 and above</td>
<td>Extremely High</td>
<td>Very Superior</td>
</tr>
<tr>
<td>120–129</td>
<td>Very High</td>
<td>Superior</td>
</tr>
<tr>
<td>110–119</td>
<td>High Average</td>
<td>High Average</td>
</tr>
<tr>
<td>90–109</td>
<td>Average</td>
<td>Average</td>
</tr>
<tr>
<td>80–89</td>
<td>Low Average</td>
<td>Low Average</td>
</tr>
<tr>
<td>70–79</td>
<td>Very Low</td>
<td>Borderline</td>
</tr>
<tr>
<td>69 and below</td>
<td>Extremely Low</td>
<td>Extremely Low</td>
</tr>
</tbody>
</table>
Scaled and Standard Process Scores

Table 1.4 Scaled and Standard Process Score Abbreviations and Score Type

<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>DSm</td>
<td>Scaled</td>
</tr>
<tr>
<td>Digit Span Backward</td>
<td>DSc</td>
<td>Scaled</td>
</tr>
<tr>
<td>Digit Span Sequencing</td>
<td>DSt</td>
<td>Scaled</td>
</tr>
<tr>
<td>Cancellation Random</td>
<td>Car</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>NSco</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>NSln</td>
<td>Standard</td>
</tr>
</tbody>
</table>

Raw Process Scores

- Simple raw scores; not age referenced, convert to base rates
- 6 Longest Span and Sequence Scores (example: LDSf, LDSb, LDSs)
- 10 Error Scores (example: rotation errors on BD, CD, and SS, number of errors on Naming Speed Literacy)
  - Interpretation on Naming Speed subtests, based only on time
- Process observations (e.g., Don’t Know, No Response)
  - Not on Record Form
  - Appendix D in Technical and Interpretive Manual
Contrast Scores

- Provide information about performance on a task of interest in comparison to other children who scored at the same level on a related task
- 6 in total (example: DSF vs. DSB)
- Not on Record Form
- Appendix C in Technical and Interpretive Manual

Theoretical Foundations

- Numerous structural models of intelligence, Wechsler considers various models, of which CHC is one
- Wechsler model accounts for important aspects of cognitive ability that these models converge upon
- CHC theory is still evolving
- CHC theory does not account for important lessons we learn from working memory models (chapter 2 Tech and Interp Manual)
- Wechslers select subtests based upon clinical utility, not just theory
- Using CHC taxonomy to talk to customers...
### CHC Taxonomy, Index Scores

<table>
<thead>
<tr>
<th>Index Score</th>
<th>CHC Broad Ability (Narrow)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VCI</td>
<td>Gc</td>
</tr>
<tr>
<td>VSI</td>
<td>Gv</td>
</tr>
<tr>
<td>FRI</td>
<td>Gf</td>
</tr>
<tr>
<td>WMI</td>
<td>Gsm (MW, MS)</td>
</tr>
<tr>
<td>PSI</td>
<td>Gs</td>
</tr>
<tr>
<td>QRI</td>
<td>Gf (RQ), Gq</td>
</tr>
<tr>
<td>AWMI</td>
<td>Gsm (MW, MS)</td>
</tr>
<tr>
<td>NSI</td>
<td>Glr (NA)</td>
</tr>
<tr>
<td>STI</td>
<td>Glr (MA)</td>
</tr>
<tr>
<td>SRI</td>
<td>Glr</td>
</tr>
</tbody>
</table>

### CHC Taxonomy, Subtests

<table>
<thead>
<tr>
<th>Subtest</th>
<th>CHC Broad Ability (Narrow)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Similarities</td>
<td>Gc (VL, LD)</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>Gc (VL)</td>
</tr>
<tr>
<td>Information</td>
<td>Gc (K0)</td>
</tr>
<tr>
<td>Comprehension</td>
<td>Gc (K0, LD)</td>
</tr>
<tr>
<td>Block Design</td>
<td>Gv (Vz)</td>
</tr>
<tr>
<td>Visual Puzzles</td>
<td>Gv (SR)</td>
</tr>
<tr>
<td>Matrix Reasoning</td>
<td>Gf (I, RG)</td>
</tr>
<tr>
<td>Figure Weights</td>
<td>Gf (RQ)</td>
</tr>
<tr>
<td>Picture Concepts</td>
<td>Gf (I)</td>
</tr>
<tr>
<td>Arithmetic</td>
<td>Gf (RQ, Gq)</td>
</tr>
</tbody>
</table>
### CHC Taxonomy, Subtests

<table>
<thead>
<tr>
<th>Subtest</th>
<th>CHC Broad/Narrow Ability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digit Span</td>
<td>Gsm (MW, MS)</td>
</tr>
<tr>
<td>Picture Span</td>
<td>Gsm (MW, MS)</td>
</tr>
<tr>
<td>Letter-Number Seq</td>
<td>Gsm (MW, MS)</td>
</tr>
<tr>
<td>Coding</td>
<td>Gs (R9, MA)</td>
</tr>
<tr>
<td>Symbol Search</td>
<td>Gs/ (P, R9)</td>
</tr>
<tr>
<td>Cancellation</td>
<td>Gs/ (P, R9)</td>
</tr>
<tr>
<td>Naming Speed Literacy</td>
<td>Glr (F1, NA)</td>
</tr>
<tr>
<td>Naming Speed Quantity</td>
<td>Glr (F1, NA)</td>
</tr>
<tr>
<td>Immediate Symbol Translation</td>
<td>Glr (MA, L1)</td>
</tr>
<tr>
<td>Delayed Symbol Translation</td>
<td>Glr (MA, L1)</td>
</tr>
<tr>
<td>Recognition Symbol Translation</td>
<td>Glr (MA, L1)</td>
</tr>
</tbody>
</table>

### The WISC-V and the DSM-5

- Clinical studies adhere to DSM-5 criteria changes
  - Intellectual Disability Mild and Moderate
  - Borderline Intellectual Functioning
  - Specific Learning Disorder – Reading
  - Specific Learning Disorder – Reading and Written Expression
  - Specific Learning Disorder - Mathematics
  - ADHD
  - Autism Spectrum Disorder-With Language Impairment
  - Autism Spectrum Disorder-Without Language Impairment

- Nonverbal Index (NVI)
  - Some DSM-5 conditions: nonverbal measure of ability necessary to establish criteria
  - ID established, language disorder under consideration
  - Language impairment estab., ID being considered, cannot obtain valid VC subtest scores, need NVI
# Subtest Reliability (good to excellent)

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Internal Consistency Reliability</th>
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</thead>
<tbody>
<tr>
<td>Similarities</td>
<td>.87</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>.87</td>
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<tr>
<td>Information</td>
<td>.86</td>
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<td>Comprehension</td>
<td>.83</td>
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<td>Block Design</td>
<td>.84</td>
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<td>Visual Puzzles</td>
<td>.89</td>
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<td>Matrix Reasoning</td>
<td>.87</td>
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<tr>
<td>Figure Weights</td>
<td>.94</td>
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<tr>
<td>Picture Concepts</td>
<td>.83</td>
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<tr>
<td>Arithmetic</td>
<td>.90</td>
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<td>Digit Span</td>
<td>.91</td>
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<tr>
<td>Picture Span</td>
<td>.85</td>
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<tr>
<td>Letter-Number Sequencing</td>
<td>.86</td>
</tr>
<tr>
<td>Coding*</td>
<td>.82</td>
</tr>
<tr>
<td>Symbol Search*</td>
<td>.81</td>
</tr>
<tr>
<td>Cancellation*</td>
<td>.82</td>
</tr>
<tr>
<td>Naming Speed Literacy*</td>
<td>.86</td>
</tr>
<tr>
<td>Naming Speed Quantity*</td>
<td>.83</td>
</tr>
<tr>
<td>Immediate Symbol Translation*</td>
<td>.88</td>
</tr>
<tr>
<td>Delayed Symbol Translation*</td>
<td>.87</td>
</tr>
<tr>
<td>Recognition Symbol Translation</td>
<td>.82</td>
</tr>
</tbody>
</table>

* = test-retest stability (split half would artificially inflate reliability estimate)

# Composite Score Reliability (excellent)

<table>
<thead>
<tr>
<th>Composite Score</th>
<th>Internal Consistency Reliability</th>
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</thead>
<tbody>
<tr>
<td>VCI</td>
<td>.92</td>
</tr>
<tr>
<td>VSI</td>
<td>.92</td>
</tr>
<tr>
<td>FRI</td>
<td>.93</td>
</tr>
<tr>
<td>WMI</td>
<td>.92</td>
</tr>
<tr>
<td>PSI*</td>
<td>.88</td>
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<tr>
<td>FSIQ</td>
<td>.96</td>
</tr>
<tr>
<td>QRI</td>
<td>.95</td>
</tr>
<tr>
<td>AWMI</td>
<td>.93</td>
</tr>
<tr>
<td>NVI</td>
<td>.95</td>
</tr>
<tr>
<td>GAI</td>
<td>.96</td>
</tr>
<tr>
<td>CPI</td>
<td>.93</td>
</tr>
<tr>
<td>NSI*</td>
<td>.90</td>
</tr>
<tr>
<td>STI</td>
<td>.94</td>
</tr>
<tr>
<td>SRI</td>
<td>.94</td>
</tr>
</tbody>
</table>

*= test-retest stability
Interpretative Considerations

• All cognitive tests require multiple cognitive processes.
• Tests vary in the degree to the number of processes invoked and the difficulty of the task for examinees.
• WISC-V primary and complementary measures are specifically designed to measure complex cognitive processes while ancillary measures are designed to measure processes related to learning difficulties.
  - Of all WISC-V primary measures Processing Speed is the least complex and does not have a item difficulty gradient.
  - Ancillary and Processing Speed subtests may show a different pattern of responses in gifted and ID cases compared to power tests.
• The interpretation section is written to highlight some of the complexities of the tasks but is not as detailed as would be in a book.

Highlights of Interpretation

• VCI is now strongly associated with word knowledge: storage, access/retrieval, and application. Expressive language skills are less prominent with Comprehension not contributing to the index.
• PSI is very similar to previous editions with some minor changes which may increase difficulty of coding.
• WMI is now multi-modal and there is a greater emphasis on sequencing with changes to DS and addition of PS.
• FSIQ is generally downplayed in the manual though some customers will focus only on that single number. Ratio of verbal tests to visually based is slightly lower but overall all functioning is quite similar to WISC-IV. Short form actually has some very desirable psychometric qualities which were better than some of the longer forms and certainly no worse than full 10 subtest.
Highlights of Interpretation VSI vs FRI

- Customers may wonder about how these are really different and what the implications of deficits on these measures.

- VSI = architect
  - These tests focus on constructional abilities. That is, the use of visual information to build a geometric design to match a model. This is a reasoning task but the type of reasoning is quite different than FRI. It involves the ability to identify the spatial relationships and visual details of objects for the purpose of building a new design. The parts must be seen as elements of the whole design. It is a reasoning task because the solutions require more than simply matching a part to a part in the design. Mental rotation and visualization of the solution is required which is why it is more architect than just construction site manager.

- FRI = detective
  - Use visual information to identify a common theme or concept. The visual information does not directly provide a solution to the problem rather the relationship among visual-spatial elements provides clues as to the single underlying concept that binds them all together. Once the examinee figures out the underlying conceptual link must be able to apply that knowledge to identify the correct solution.

- Speculative Dorsal versus Ventral Stream of vision

Digit Span Backward Versus Sequencing

- These tasks require many of the same cognitive processes.
  - Require intact auditory processes – focused attention, registration, and discrimination
  - Phonological loop – maintenance of information in conscious awareness
  - Executive functioning – strategic approach to recall
  - Procedural learning – both occur after forward so they learn basic aspects of the process

- How are they different?
  - Requires knowledge of the value of numbers and location on number line (sequencing)
  - Verbal response sequence is no fixed (sequencing)
  - Repeated numbers in the string must be tracked (sequencing)
  - The verbal response can be start being formulated as soon as first digit presented (backward)
Picture Span

- The mode of stimulus presentation is visual
- Rehearsal is most likely verbal/phonological loop
- Proactive Interference—refers to the same items presented earlier in the test recurring throughout later parts of the test which might interfere with recall
  - Sometimes will be a target and sometimes a distractor
  - Conceptually—something learned earlier interferes with learning similar content at a later time
- Proactive interference as applied here is really not the same as proactive interference used in neuropsychology—primary difference is that in np refers to a long-term memory process and information recently acquired in long-term memory blocks or interferes with trying to learn similar information (e.g., learning French then going to a class to learn Spanish). On WISC-V, the examinee should not be trying to remember the information all so it’s a failure to clear out working memory stores across items.

Figure Weights

- This task requires the child to apply the quantitative concept of equality to understand the relationship among objects and then use the concepts of matching, addition, and/or multiplication to identify the correct response.
- Like MR visual information informs the child about the conceptual relationship among objects but in this case the concept relates to how they are equivalent.
- Unlike MR, the child does not have to follow a series of steps to identify the linking concept rather the difficulty lies in applying the equality rule and selecting the proper operation to get the correct response.
Visual Puzzles

- The subtest is designed to measure mental, non-motor, construction ability which requires visual and spatial reasoning, mental rotation, visual working memory, understanding part-whole relationships, and the ability to analyze and synthesize abstract visual stimuli.
- Compared to Block Design
  - Non-motor
  - Does not use of same visual stimuli across items so do not get procedural and active learning
  - Does not use physical stimuli so cannot get immediate, concrete, visual feedback on correctness or solutions or partial solutions – can’t use trial and error approach
  - Requires greater degree of mental rotation

Naming Speed

- These tests are not the same as processing speed even though both use visual stimuli, require the child to work as fast as possible, and have no item difficulty gradient
- These tasks measure automaticity of semantic and quantity retrieval.
- In younger children, may not be fully automatized and may see more response errors while older kids should not miss any.
- Naming Speed vs Processing Speed
  - Naming speed=warehouse worker “must quickly identify needed product, find it, and ship it out”
  - Processing Speed=clerical worker “must quickly fill in forms or identify incorrect or missing information from forms”
Symbol Translation

• Verbal-Visual Association Multi-Trial Learning and recall
  • Cued recall paradigm – no free recall. Immediate, delayed, and recognition (not a yes no recognition but must match correct word with symbol-eliminates recall of unlearned information and is an indicator of strength of the verbal-visual association).

• Analogy- Warehouse manager-tells warehouse workers where to put new items in the warehouse for easy retrieval. Tells warehouse workers what to get from warehouse.

• Immediate – learning trials indicate the amount of information learned with repetition.

• Delayed – how much information is retained over time.

• Delayed Recognition – does the examinee have retrieval or encoding difficulties

• Contrast scores IST vs DST = loss of information, RST vs DST = retrieval versus encoding deficits

Quantitative Reasoning

• New complementary index comprised of Figure Weights and Arithmetic
  • Also appears in WAIS-IV/WMS-IV Advanced book as FW, SA, + AR

• AR requires actual math problem solving; however, AR is very complex having Fluid Reasoning, Verbal, and Working Memory components

• FW requires math skills in a more limited abstract manner. Requires the ability to reason through a problem and to select the best quantitative operation to obtain the correct response.
Auditory Working Memory

- Digit Span and Letter-Number Sequencing
- Very similar to WISC-IV working memory with greater focus on sequencing than previous edition.
- Contrast scores:
  - DSF VS DSB impact of additional mental manipulation required by DSB
  - DSF VS DSS impact of sequencing and number knowledge required by DSS
  - DSS VS LNS impact of dual-tasking and letter knowledge
- Useful when global difficulties with visual processing affecting test performance

Nonverbal Index

- Comprised of all visual tests from FSIQ and also Visual Puzzles and Picture Span
- Useful when examinee has clear verbal difficulties
  - ELL
  - RELD, ELD
  - ASD with Language Impairment
- Does have processing speed which can affect results just like FSIQ.
- More emphasis on Visual-Spatial Reasoning than FSIQ
Highlights of Validity Evidence

- The WISC-V has a number of validity studies to support the interpretation of new and existing subtests
- Validity evidence is about interpretation not about if the test itself is valid
- General ability interpretations
  - Correlation with predecessors
  - GT, Mild ID, Moderate ID
  - Correlation with adaptive functioning controls and clinical cases
- Cognitive Processes Related Learning/Academic performance
  - Correlation with WIAT-III, KTEA-3, in Typically developing and WIAT-III in LD cases
  - Clinical samples RD, RWD, MD
- Behavioral Regulation
  - Correlation with BASC-II (controls and clinical cases)
  - Correlation with Brown ADD scaled (ADHD)
  - Clinical Samples: ADHD, Disruptive Behavior Disorder

Highlights of Validity Evidence

- Cognitive Profiles associated with ASD
  - Clinical Studies ASD with and without Language Impairment
- Sensitivity to Brain Functioning
  - Research review – chapter 2
  - Clinical Sample TBI
- Cultural/Language Effects on Performance
  - Clinical study - ELL
VCI

- Correlation WISC-IV = .85, WPPSI-IV = .71, WAIS-IV = .83 KABC-II
- GC = .74
- Correlation KTEA-III-Reading = .77, Math = .67, Writing = .61
- Correlation WIAT-III-Reading = .65, Math = .53, Writing = .60
- Gifted (127.7, es = 1.74), BIF (81.7, es = 1.03), Mild ID (66.0, 2.14).
- Mod ID (55.2, es = 3.30)
- RD (89.1, es = .98), RWD (86.5, es = .74), MD (90.3, es = .61)
- ADHD (97.8, es = .40), DB (94.1, es = .33)
- ASD-LI (80.4, es = 1.47), ASD-NLI (102.5, es = .17)
- TBI (88.9, es = .76), ELL (85.6, es = .76)

VSI

- Correlation WISC-IV = .63, WPPSI-IV = .60, WAIS-IV = .78 KABC-II
- FCI = .65
- Correlation KTEA-III-Reading = .47, Math = .57, Writing = .39
- Correlation WIAT-III-Reading = .30, Math = .44, Writing = .39
- Gifted (121.2, es = 1.35), BIF (83.1, es = 1.40), Mild ID (66.0, 2.82).
- Mod ID (56.8, es = 3.23)
- RD (93.3, es = .62), RWD (96.2, es = .13), MD (85.4, es = 1.04)
- ADHD (97.3, es = .28), DB (97.1, es = .33)
- ASD-LI (82.8, es = 1.47), ASD-NLI (100.7, es = .17)
- TBI (87.5, es = 1.09), ELL (93.4, es = -.07)
FRI

- Correlation WISC-IV = .63, WPPSI-IV = .51, WAIS-IV = .56, KABC-II FCI = .65
- Correlation KTEA-III-Reading = .56, Math = .66, Writing = .47
- Correlation WIAT-III-Reading = .32, Math = .45, Writing = .33
- Gifted (120.3, es = -1.26), BIF (87.1, es = .98), Mild ID (67.0, 2.35)
  Mod ID (58.6, es = 2.58)
- RD (92.5, es = .77), RWD (88.4, es = .74), MD (82.2, es = .91)
- ADHD (97.6, es = .38), DB (94.4, es = .11)
- ASD-LI (84.3, es = .98), ASD-NLI (100.9, es = .17)
- TBI (88.4, es = 1.16), ELL (95.2, es = -.07)

WMI

- Correlation WISC-IV = .65, WPPSI-IV = .53, WAIS-IV = .76, KABC-II GSM = .63, MPI = .65
- Correlation KTEA-III-Reading = .54, Math = .49, Writing = .51
- Correlation WIAT-III-Reading = .53, Math = .46, Writing = .47
- Gifted (117.9, es = -1.16), BIF (78.2, es = 1.45), Mild ID (65.1, 2.64)
  Mod ID (58.3, es = 2.90)
- RD (87.8, es = 1.52), RWD (85.8, es = 1.08), MD (88.7, es = .52)
- ADHD (94.8, es = .54), DB (95.3, es = -.02)
- ASD-LI (77.6, es = 1.57), ASD-NLI (95.4, es = .60)
- TBI (86.2, es = .98), ELL (87.8, es = .76)
PSI

- Correlation WISC-IV = .71, WPPSI-IV = .39, WAIS-IV = .83 KABC-II 
  Gv = .25
- Correlation KTEA-III-Reading = .20, Math = .32, Writing = .34
- Correlation WIAT-III-Reading = .29, Math = .41, Writing = .33
- Gifted (112.9, es = -.92), BIF (95.1, es = .11), Mild ID (71.6, 1.87) Mod 
  ID (59.3, es = 2.92)
- RD (93.0, es = .50), RWD (93.0, es = .24), MD (90.2, es = .50)
- ADHD (94.2, es = .43), DB (92.8, es = -.04)
- ASD-LI (75.8, es = 1.24), ASD-NLI (89.4, es = .52)
- TBI (84.1, es = .78), ELL (97.6, es = .35)

QRI

- Correlation KABC-II FCI = .63
- Correlation KTEA-III-Reading = .63, Math = .77, Writing = .56
- Correlation WIAT-III-Reading = .49, Math = .66, Writing = .52
- Gifted (122.1, es = -1.55), BIF (86.3, es = 1.71), Mild ID (64.2, 2.67) 
  Mod ID (57.1, es = 3.19)
- RD (92.2, es = .80), RWD (85.9, es = .98), MD (79.9, es = 1.09)
- ADHD (94.8, es = .62), DB (93.8, es = .12)
- ASD-LI (78.9, es = 1.35), ASD-NLI (101.7, es = .1)
- TBI (85.6, es = 1.08), ELL (93.9, es = .36)
AWMI

- Correlation WISC-IV = .76, WPPSI-IV = .44, WAIS-IV = .75 KABC-II GSM = .64
- Correlation KTEA-III-Reading=.58, Math=.51, Writing=.61
- Correlation WIAT-III-Reading=.61, Math=.58, Writing=.54
- Gifted (123.0, es =1.32), BIF (76.6, es=1.63), Mild ID (62.2, 2.91)
  Mod ID (54.1, es=3.56)
- RD (90.1, es = 1.14), RWD (85.0, es=1.29), MD (88.3, es=.69)
- ADHD (95.2, es = .50), DB (94.5, es=.13)
- ASD-LI (72.3, es = 1.70), ASD-NLI (94.1, es=.66)
- TBI (87.7, es = .89), ELL (85.8, es=.81)

NVI

- Correlation KABC-II FCI = .73 MPI = .73
- Correlation KTEA-III-Reading=.61, Math=.77, Writing=.56
- Correlation WIAT-III-Reading=.46, Math=.59, Writing=.53
- Gifted (122.9, es -1.64), BIF (82.1, es=1.56), Mild ID (62.1, 2.91)
  Mod ID (53.4, es=3.16)
- RD (89.6, es = 1.04), RWD (88.6, es=.60), MD (81.5, es=1.09)
- ADHD (94.4, es = .57), DB (93.6, es=-.18)
- ASD-LI (79.9, es = 1.33), ASD-NLI (97.5, es=.43)
- TBI (85.9, es = 1.30), ELL (93.0, es=.14)
NSI

- Correlation KTEA-III-Reading=.26, Fluency=.42, Decoding = .25, Orthographic=.47, Sound-Symbol = .17, Math = .24
- Correlation WIAT-III-Reading=.31, Basic Reading=.31, Math = .33 Math Fluency=.43
- RD (88.4, es = .95), RWD (86.2, es=1.27), MD (92.6, es=.23)
- ADHD (92.7, es = .58), DB (100.9, es=-.28)
- ASD-LI (78.9, es = 1.51), ASD-NLI (90.6, es=1.01)

STI

- Correlation KTEA-III-Reading=.45, Fluency=.48, Decoding = .50, Orthographic=.42, Sound-Symbol = .52, Math = .34
- Correlation WIAT-III-Reading=.31, Basic Reading=.26, Math = .39 Math Fluency=.14
- RD (91.8, es = .80), RWD (87.1, es=.93), MD (90.1, es=.63)
- ADHD (100.8, es = .00), DB (99.5, es=.08)
- ASD-LI (87.6, es = 1.00), ASD-NLI (106.1, es=-.39)
SRI

- Correlation KTEA-III-Reading=.46, Fluency=.58, Decoding = .48, Orthographic=.60, Sound-Symbol = .43, Math = .37
- Correlation WIAT-III-Reading=.43, Basic Reading=.41, Math = .47 Math Fluency=.38
- RD (87.4, es = 1.23), RWD (83.9, es=1.31), MD (89.7, es=.55)
- ADHD (96.5, es = .37), DB (100.0, es=-.11)
- ASD-LI (82.4, es = 1.51), ASD-NLI (97.9, es=.28)

CHC

- Not a theory
- Not contemporary
- Descriptive-measurement model
- Tests validity is about how it fits into cfa and not other validity factors. Define validity of a test by its fit in the model rather than clinical utility
- Cfa-depends on what you put into it
- Relied on existing tests to develop theory did not start as a theory and predict what tests would fall into specific domains.
WJ4-CHC Clusters

- **Gc** (Comprehension/Knowledge)
  - Oral voc, general info, picture voc, oral comprehension
- **Gf** (Fluid Reasoning)
  - Number Series, Concept Formation, Analysis/Synthesis
- **Gsm** (Working/Short-Term Memory)
  - Verbal Attention, Numbers Reversed, Memory for Words, Object-Number Sequencing
- **Ga** (Auditory Processing)
  - phonological processing, Nonword Repetition, segmentation, sound blending

WJ4-CHC Clusters

- **Gs** (Processing Speed)
  - Letter-pair matching, pair cancelation, number pattern
- **Glr** (Learning and Retrieval)
  - Story recall, visual-auditory learning, rapid picture naming, retrieval fluency
- **Gv** (Visual Processing)
  - Visualization, Picture Recognition
WJ4-Scholastic Aptitude Clusters

- Combine tests from across ability domains always 4 subtests
  - Reading Comp
    - Voc, conceptual reasoning, processing speed, phonological processing
  - Word Reading
    - Voc, auditory wm, processing speed, phonological processing

WJ4-Scholastic Aptitude Clusters

- Broad Writing
  - Voc, processing speed, phonological, story memory
- Basic Writing-same as basic reading
  - Voc, auditory wm, processing speed, phonological processing
- Broad Math
  - Quantitative (number series), voc, pair matching, visual-perceptual (visualization)
- Math Problem Solving
  - Quantitative (analysis/synthesis), voc, awm (numbers reversed), visual-perceptual (visualization)
Need a Focused Client Based Approach

- Signal to noise ratio
  - Adding additional tests can increase signal or can increase noise
  - Adding targeted tests increase signal to noise
- Consistency of deficit
  - Need 3 scores to identify true low ability in a domain
- Select tests related to the problem
- Need to get away from shot-gun approaches to testing specific hypotheses

WISC-V-WIAT-III Typically Developing

- Word Reading
  - VCI and AWMI $R^2 = .283$
- Word Reading
  - DS, VC, NSLN, DST $R^2 = .333$
  - DS, IN, CO, DST, and NSLN $R^2 = .362$
- Pseudoword Decoding
  - WMI, VCI, and NSI $R^2 = .242$
- Pseudoword Decoding
  - DS, NSLN, VC, DST $R^2 = .284$
  - DS, NSLN, IN, CO, DST $R^2 = .362$
WISC-V-WIAT-III Typically Developing

- Reading Comprehension
  - VCI, FRI, and AWMI $R^2 = .283$
- Reading Comprehension
  - SI, VC, MR, DST $R^2 = .310$
  - SI, CO, AR, DST $R^2 = .333$
- Total Reading
  - VCI, AWMI, SRI $R^2 = .427$
- Total Reading
  - DS, VC, NSLN, SI, DST $R^2 = .427$
  - IN, DS, AR, NSLN, SI, CO $R^2 = .441$

WISC-V-WIAT-III Typically Developing

- Basic Reading
  - VCI, AWMI, WMI, NSI $R^2 = .329$
- Basic Reading
  - VC, DS, NSLN $R^2 = .342$
  - IN, DS, NSLN, AR $R^2 = .364$
- Oral Reading Fluency
  - VCI, NSI, AWMI $R^2 = .302$
- Oral Reading Fluency
  - NSLN, VC, CD, DS, SI, DST $R^2 = .268$
  - LNS, NSLN, VC $R^2 = .313$
WISC-V-WIAT-III Typically Developing

- Numerical Operations
  - QRI, PSI, AWMI, VCI $R^2=.290$
- Numerical Operations
  - SI, DS, CD, FW, NSQ $R^2=.287$
  - AR, SI, CD $R^2=.309$
- Math Problem Solving
  - QRI, AWMI, VSI $R^2=.397$
- Math Problem Solving
  - DS, DST, FW, CD, BD, VC $R^2=.363$
  - AR, BD, DST, FW, DS $R^2=.434$

WISC-V-WIAT-III Typically Developing

- Total Math
  - VCI, FRI, and AWMI $R^2=.437$
- Total Math
  - DS, CD, FW, DST, SI $R^2=.397$
  - AR, CD, SI, FW, DST, DS $R^2=.448$
- Math Fluency
  - QRI, PSI, AWMI, NSI $R^2=.392$
- Math Fluency
  - CD, DS, NSLQ, FW $R^2=.309$
  - AR, CD, NLS, NSQ $R^2=.427$
WISC-V-WIAT-III Typically Developing

- Spelling
  - AWMI, VCI, FRI $R^2 = .367$

- Spelling
  - DS, VC, NSLN, DST $R^2 = .361$
  - IN, DS, AR, NSLI, MR $R^2 = .425$

- Essay Composition
  - PSI, VCI, QRI $R^2 = .137$

- Essay Composition
  - CD, SI, FW $R^2 = .132$
  - CD, CO, FW $R^2 = .135$
WISC-V-WIAT-III Typically Developing

- Total Writing
  - VCI, AWMI, PSI, QRI $R^2 = .348$
- Total Writing
  - DS, SI, CD, VC $R^2 = .316$
  - SI, AR, IN, LN, CD $R^2 = .362$

WISC-V-WIAT-III

- General Findings
  - More tests, indexes, measures, etc… does not necessarily enhance prediction of academic performance.
  - Need focused and targeted assessment
  - If VCI and AWMI/WMI are low, you would predict general deficits in academic functioning suggesting that these measures should included as part of all LD evaluations
  - New Ancillary measure provide information that is different from primary and complimentary measures
WISC-V-WIAT-III

• Basic Reading
  • Evaluate VCI, WM, and Naming Speed
  • Use Phonological Processing from NEPSY-II or PAL-II depending on age
  • Arithmetic does add predictive power due to verbal, WM, and FR qualities
• Reading Comprehension
  • Evaluate VCI, FRI, WM, and DST (have to give IST)
  • Evaluate VCI, WIAT-III WR, and FRI (Pseudoword not add predictive value above WR)
• Reading Fluency
  • VCI, NSI, AWMI also LNS is a good predictor
  • Use Phonological Processing from NEPSY-II or PAL-II depending on age
  • Evaluate WIAT-III WR, VCI, NSI and PSI (Pseudoword not add predictive value above WR)

WISC-V-WIAT-III

• Numerical Operations
  • Evaluate QRI, PSI, AWMI and VCI
  • Arithmetic does add predictive power due to computational, verbal, QRI and FR qualities
• Math Problems Solving
  • Evaluate QRI, AWMI, and VSI
  • DST adds predictive power
• Math Fluency
  • Evaluate QRI, PSI, AWMI, and NSI
  • Arithmetic does add predictive power due to computational, verbal, QRI and FR qualities
WISC-V-WIAT-III

- Spelling
  - AWWI, VCI, FRI
  - AR, NSLN and DST add predictive power
- Essay Composition
  - PSI, VCI, QRI $R^2 = .137$

Clinical Cases

- Each case was selected from a unique clinical sample.
- To the degree possible, WISC-V and WIAT-III data were provided
- What would you say about each case, cognitively
- From WISC-V data. Would you expect academic difficulties and if yes in what domains
- Does the profile of scores help you with diagnostic considerations using WISC-V in isolation and when combined with WIAT-III data?