### Why Revise?
- New research on cognitive abilities, enormous literature on the WISC – III
- Demographic Shifts
  - e.g. Hispanic population changes (from 11% to 15%)
  - Regions (growth of the West/South at expense of NE)
  - Flynn Effect

### Revision Goals - I
- Strengthen Four-Factor Model
- Improve assessment of:
  - Fluid Reasoning
  - Working Memory
  - Processing Speed
- Enhance clinical utility, and provide strong evidence of clinical validity.

### Agenda
- A broad look at the changes and why we made them.
- A closer look at the new and familiar subtests
- Research design of the new WISC IV
- Psychometric properties of the test
- Interpretive considerations

### Revision Goals - II
- Remove time-bonuses where possible.
- Put speed where it belongs.
- Improve Psychometric Properties
  - Subtest floors and ceilings
  - Remove potentially biased items
- Link to measures of achievement, memory, adaptive behavior, emotional intelligence, giftedness and a cognitive process instrument.

### Role of Intelligence Tests
The task of assessing a child’s intelligence necessarily involves more than simply obtaining his or her scores. As Wechsler (1975) noted: *What we measure with tests is not what tests measure—not information, not spatial perception, not reasoning ability. These are only a means to an end. What intelligence tests measure is something much more important; the capacity of an individual to understand the world about him and his resourcefulness to cope with its challenges.*
Composite Scores

- Dual (or dueling?) IQ and Index structure gone.
- Now...four Indexes:
  - Verbal Comprehension = VCI
  - Perceptual Reasoning = PRI
  - Working Memory = WMI
  - Processing Speed = PSI
- ...and FSIQ (consisting of 10 subtests)

Changes

- Updated theoretical foundations
- Enhanced clinical utility
- Increased developmental appropriateness
- Improved psychometric properties
- Increased user friendliness

Full Scale IQ

- Stronger contributions of working memory and processing speed
- 30% each VCI and PRI
- 20% each PS and WM

Structure of WISC IV

- VCI: Similarities, Vocabulary, Comprehension, Information, Word Reasoning
- PRI: Block Design, Picture Concepts, Matrix Reasoning, Picture Completion
- WMI: Digit Span, Letter-Number Sequencing, Arithmetic
- PSI: Coding, Symbol Search, Cancellation

Composite Scores

Perceptual Reasoning Index (PRI)
- Shift in emphasis from organization to reasoning
- Emphasis on fluid reasoning in the perceptual domain
- Subtests are highly g-loaded

Subtests

- Core Subtests (10 of them)
  - Are administered when composite scores are desired
- Supplemental Subtests (5 of them)
  - Extend the range of cognitive skills sampled and provide additional clinical information as they enable the clinician to complete additional discrepancy analysis. They can also be used as substitutes for core subtests.
### User Friendliness
- Testing time reduced
- Administration procedures simplified
- Use of supplemental subtests for a core subtest based on clinical need and appropriateness
- Manual reorganization
- Record Form reorganization

### Composite Scores
**Working Memory Index**
- Essential component of fluid reasoning and other higher order skills
- Closely related to achievement and learning

See Fry & Hale, 1996; Perlow, Juttuso, & Moore, 1997; Swanson, 1996

### Content Changes
- Deleted 3 subtests
  - Picture Arrangement
  - Object Assembly
  - Mazes
- Retained, but revised, 10 subtests
- Added 5 new subtests

### Composite Scores
**Processing Speed Index**
- Dynamically related to mental capacity, reading performance & development, and reasoning by conservation of resources (e.g., efficiency)

See Fry & Hale, 1996; Kail, 2000; Kail & Hall, 1994; Kail & Salthouse, 1994; Berninger, 2001

### New Subtests
- Picture Concepts
- Letter-Number Sequencing
- Matrix Reasoning
- Cancellation
- Word Reasoning

### Process Scores
- In addition to the subtest and composite scores, several additional process scores which provide more detailed information about a child’s performance, are available.
- No additional administration procedures are required to derive these scores.
- Process scores can NEVER be substituted for core or supplemental subtest scores in the calculation of composite scores.
<table>
<thead>
<tr>
<th>Cancellation</th>
<th>Picture Concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>The child scans both a random and structured arrangement of pictures and marks target pictures within a specified time limit.</td>
<td>For each item, the child is presented with 2 or 3 rows of pictures and chooses one picture from each row to form a group with a common characteristic.</td>
</tr>
<tr>
<td>- Measure of processing speed and visual selective attention</td>
<td>- Measure of fluid reasoning and abstract categorical reasoning (without verbal response).</td>
</tr>
<tr>
<td>- 2 forms (Random &amp; Structured)</td>
<td>- Items progress from relatively concrete to more abstract.</td>
</tr>
<tr>
<td>- Forms share identical target locations</td>
<td>- 28 items</td>
</tr>
<tr>
<td>- Targets are animals</td>
<td></td>
</tr>
<tr>
<td>- Foils are common non-animal objects</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Word Reasoning</th>
<th>Letter-Number Sequencing</th>
</tr>
</thead>
<tbody>
<tr>
<td>The child is asked to identify the common concept being described in a series of clues.</td>
<td>The child is read a sequence of numbers and letters and recalls the numbers in ascending order and the letters in alphabetical order.</td>
</tr>
<tr>
<td>- Measure of verbal comprehension, analogical and general reasoning ability, verbal abstraction, domain knowledge, the ability to integrate and synthesize different types of information, and the ability to generate alternative concepts.</td>
<td>- Measure of working memory</td>
</tr>
<tr>
<td>- Designed to measure fluid reasoning with verbal material.</td>
<td>- Adapted from the WAIS-III (but new items)</td>
</tr>
<tr>
<td>- 24 items</td>
<td>- Involves sequencing, mental manipulation, attention, short-term auditory memory, visuospatial imaging, and processing speed</td>
</tr>
<tr>
<td></td>
<td>- Gets credit with either order</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Updates to Existing Subtests</th>
<th>Matrix Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The child looks at an incomplete matrix and selects the missing portion from 5 response options. (35 items)</td>
</tr>
<tr>
<td></td>
<td>- Measure of fluid reasoning and perceptual organization</td>
</tr>
<tr>
<td></td>
<td>- Reliable estimate of general intellectual ability</td>
</tr>
<tr>
<td></td>
<td>- 4 types of items to assess skills</td>
</tr>
<tr>
<td></td>
<td>- Continuous and discrete pattern completion</td>
</tr>
<tr>
<td></td>
<td>- Classification</td>
</tr>
<tr>
<td></td>
<td>- Analogical reasoning</td>
</tr>
<tr>
<td></td>
<td>- Serial reasoning</td>
</tr>
</tbody>
</table>
Verbal Comprehension Subtests

- Similarities
  - Vocabulary
    - Comprehension
      - Information
      - Word Reasoning

Comprehension

- 21 items, 11 of them are new
- Scoring criteria for all items were revised

Information

- Is now a supplemental subtest
- 33 items, 11 of them are new
- Scoring criteria for some retained items have been modified

Similarities

- 23 items, 11 of which are new
- Scoring criteria for all items were revised
- Sample item has been revised to require a credible response from the child before beginning the subtest rather than the corrective feedback provided on the WISC III.
- The number of 1 point items was reduced from 5 to 2.
- Age-defined start points were added.
  
  *In what way are a ____ and a ____ alike?*

Perceptual Reasoning Subtests

Block Design

Picture Concepts

Matrix Reasoning

Picture Completion

Vocabulary

- Picture naming items in the stimulus book provide more floor.
- Vocabulary words are now displayed in Stimulus Book, in addition to being read aloud.
- 36 items, including 4 new picture items and 32 verbal items (5 new, 27 retained)
- Scoring criteria for all verbal items were revised.
### Digit Span
- Is now a core subtest and requires administration of both Digits Forward and Digits Backward
- 8 items in Digit Span Forward (2 trials each) and 8 items in Digit Span Backward (2 trials each)
- 15 trials were retained in Digit Span Forward, and 12 were retained in Digit Span Backward
- A 2-digit sample item was added to DSB
- Process scores are available to compare DSF and DSB and LDSF and LDSB

### Block Design
- 14 items, 11 were retained from WISC III, 3 were added to extend the ceiling
- Instructions have been shortened
- Discontinue rule has been increased from 2 to 3 consecutive scores of 0
- Time bonus scores restricted to the last 6 items (total raw scores for many young children will not include any time bonus points)
- Process scores available for untimed performance (BDN)

### Arithmetic
- Reduced math knowledge requirements while increasing the working memory demands
- 34 items, 11 items involve the same math calculation as items on WISC III, but verbatim instructions have been revised.
- Time bonuses are gone.
- Task more like 'real-world' working memory demands

### Picture Completion
- Now a supplemental subtest
- All new artwork
- Items are designed to focus less on attention to minor visual details and more on reasoning
- Scoring criteria were revised and include distinctions between those verbal responses that require pointing and those that should be awarded credit without pointing
- 38 items, including 13 new items

### Processing Speed Subtests
- Coding
  - Symbol Search
  - Cancellation
- Symbol Search
- Cancellation

### Working Memory Subtests
- Digit Span
  - Letter-Number Sequencing
  - Arithmetic
Dropped WISC-III Subtests

**Picture Arrangement**
- Why?
  - Misinterpretation!
  - Poor Reliabilities
  - Less consistent with new theoretical model

**Object Assembly**
- Why?
  - Less consistent with new theoretical model (more dependent on perceptual organization than perceptual reasoning)
  - Dependence on motor skills
  - Dependence on speeded performance
  - Less “examiner-friendly”

**Mazes**
- Why?
  - Poor reliability
  - Little clinical utility
  - Infrequent use
  - Too much emphasis on Perceptual Organization and motor skills (less consistent with new model)

Coding

- Verbatim instructions for both forms A and B have been shortened to be more age appropriate.
- Additional process scores will be on the WISC IV PI, but can “test the limits” now

**Symbol Search**

- Search A and B were retained from WISC III, but 15 items were added to Symbol Search B to improve the ceiling for older children.
- Verbatim instructions for both forms have been shortened.
### WISC Standardization
- Ages 6 – 16
- Standardization Sample $n = 2200$
- 200 children at each age year
- National sample stratified by sex, parent education level, ethnicity and region.
- Extensive validity studies with 15 clinical groups.
- Links to several major tests
- See Tables 3.2-3.5 in Technical Manual for percentage descriptions of Standardization sample

### Evidence of Reliability
- **Internal Consistency**
  - Improved coefficients for retained subtests.
  - Significant improvement overall of subtests from WISC III.
  - Average reliability coefficients (calculated with Fisher’s $z$ transformation) across age groups:
    - Verbal Comprehension: .94
    - Perceptual Reasoning: .92
    - Working Memory: .92
    - Processing Speed: .88 (based on split-half)
    - Full Scale: .97

- **Special Group Reliabilities**
  - Based on sample of 661 children in 16 clinical groups. Table 4.2 in Tech Manual provides coefficients by special group.
  - The majority of the subtest reliability coefficients across special groups are similar or higher to those coefficients reported for the normative sample.
  - Average subtest reliability coefficients range from a low of .82 on DSF to a high of .93 on LN and on MR.

### Standard Errors of Measurement
- At subtest level overall average SEMs range (across ages) from low of .97 on LN to a high of 1.38 on Cancellation.
- At index level overall average SEMs range (across ages) from low of 2.68 on Full Scale to a high of 5.21 on Processing Speed.
- As a result of relatively high reliability estimates of the composite scores, the confidence intervals tend to be small and can be found in Tables A.2-A.6 in the Administration Manual.

### Test-Retest Stability
- Based on a sample of 243 children, with 18-27 from each of the 11 age groups.
- Time interval ranged from 13 to 63 days, with a mean interval of 32 days.
- Table 4.4 in Tech Manual indicate that scores possess adequate stability across time for all 5 age groups. The average corrected stability coefficient is highest for Vocabulary (.92), good (in the .80s) for BD, S, DS, CD, LN, MR, C, SS, PC, I, WR; and adequate for all others (.70s).
Frequency of Index Score Differences

- The prevalence or frequency of an observed score difference in the general population is called the base rate.
- Sometimes the difference between an individual's index scores is statistically significant but is not infrequent. The statistical significance of differences between scores and the rarity of the difference are two different issues and have two different implications for test interpretation.
- Base rates are reported in Table B.2 of the Administration manual by overall standardization sample and by ability level. It is also reported by the direction of the difference.

Test-retest Gains

- less pronounced on the Verbal Comprehension and Working Memory subtests
- score differences for combined age groups (primarily due to practice effects)
  - VCI: 2.1 points
  - PRI: 5.2 points
  - WMI: 2.6 points
  - PSI: 7.1 points
  - FSIQ: 5.6 points

Interscorer Agreement

- Based on sample of 60 cases scored independently by 4 scorers with no previous WISC IV scoring experience
- Interscorer reliabilities were
  - .98 for Similarities
  - .98 for Vocabulary
  - .95 for Comprehension
  - .96 for Information
  - .97 for Word Reasoning

Subtest Differences

- The interpretation of the difference between a single subtest score and the child's own mean score is an intraindividual comparison. Strengths and weaknesses identified in this way are relative to this child's own ability level.
- Table B.5 of the Administration manual reports the minimum differences between a single scaled score and the average scales scores of various groups of subtests required for statistical significance at the .15 and .05 levels.
- Remember a difference can be statistically significant but not especially unusual. Table B.5 also provides data on the estimated base rates of the general population.

Score Differences

- A statistically significant difference between scores refers to the likelihood that obtaining such a difference by chance is very low if the true difference between the scores is 0. The level of significance reflects the level of confidence you can have that the difference is a true difference.
- The difference between scores required for significance is computed from the standard error of measurement of the difference.
- Table B.1 in the Administration manual lists the differences between index scores required for statistical significance at the .15 and .05 levels of significance by age groups and by overall standardization sample.
Evidence of Validity

- Test-publishers can only provide preliminary evidence. Test-users will provide much of the rest.
- E.g. WAIS-WMS Technical Manual Update
- WISC IV Technical Reports available on the WISC IV website (www.Psychcorp.com)

Evidence Based on Content

- Goal was to ensure that the items and subtests adequately sample the domains of intellectual functioning that the test is intended to measure.
- Comprehensive literature and expert reviews were conducted to examine WISC III and to evaluate proposed new items and subtests.
- Theoretical rationale see Chapter 2, Technical manual for discussion.
- National review panels

Evidence Based on Response Process

- Should provide support that the child engages the expected cognitive process when responding to subtest tasks. Can be provided by theoretical sources or psychometric analysis.
- Empirical and qualitative examination of response processes during the scale’s development were conducted (e.g., response frequencies for multiple-choice items were examined to identify any responses that were commonly given in error).

Evidence Based on Internal Structure

- Nature of this evidence has evolved in line with advances in intelligence theory and assessment, as well as the fields of neuropsychology and cognitive development.
- Included intercorrelation studies and factor-analytic studies.

Validity is a Partnership

- Test-publishers can only provide preliminary evidence. Test-users will provide much of the rest.
- E.g. WAIS-WMS Technical Manual Update
- WISC IV Technical Reports available on the WISC IV website (www.Psychcorp.com)

Relationship to Other Measures

Mean Scores for WISC IV and WISC III
N=244 children, aged 6—16, mean interval 28 days

<table>
<thead>
<tr>
<th></th>
<th>WISC IV</th>
<th>WISC III</th>
<th>Corrected r₁₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>VCI/VIQ</td>
<td>103.0</td>
<td>105.4</td>
<td>.87</td>
</tr>
<tr>
<td>PRI/PIQ</td>
<td>103.9</td>
<td>107.3</td>
<td>.74</td>
</tr>
<tr>
<td>WMI/FDI</td>
<td>101.5</td>
<td>103.0</td>
<td>.72</td>
</tr>
<tr>
<td>PSI/PSI</td>
<td>102.7</td>
<td>108.2</td>
<td>.81</td>
</tr>
<tr>
<td>FSIQ/FSIQ</td>
<td>104.5</td>
<td>107.0</td>
<td>.89</td>
</tr>
<tr>
<td>VCI/VCI</td>
<td>102.9</td>
<td>106.0</td>
<td>.88</td>
</tr>
<tr>
<td>PRI/POI</td>
<td>103.9</td>
<td>106.9</td>
<td>.72</td>
</tr>
</tbody>
</table>
### Relationship to Other Measures

**Mean Scores for WISC IV and WIAT II**  
N=550 children, aged 6—16, mean interval 12 days

<table>
<thead>
<tr>
<th></th>
<th>WISC IV</th>
<th>WIAT II</th>
<th>Corrected $r_{12}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>VCI and Total Achievement</td>
<td>.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRI and Total Achievement</td>
<td>.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WMI and Total Achievement</td>
<td>.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSI and Total Achievement</td>
<td>.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FSIQ and Total Achievement</td>
<td>.87</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

### Relationship to Other Measures

**Mean Scores for WISC IV and WPPSI III**  
N=182 children, aged 6—7, mean interval 22 days

<table>
<thead>
<tr>
<th></th>
<th>WISC IV</th>
<th>WPPSI III</th>
<th>Corrected $r_{12}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>VCI/VIQ</td>
<td>100.5</td>
<td>100.2</td>
<td>.83</td>
</tr>
<tr>
<td>PRI/PIQ</td>
<td>102.6</td>
<td>102.0</td>
<td>.79</td>
</tr>
<tr>
<td>WMI</td>
<td>99.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSI/PSQ</td>
<td>103.1</td>
<td>104.4</td>
<td>.65</td>
</tr>
<tr>
<td>FSIQ/FSIQ</td>
<td>102.7</td>
<td>102.5</td>
<td>.89</td>
</tr>
<tr>
<td>GLC</td>
<td></td>
<td>97.1</td>
<td></td>
</tr>
</tbody>
</table>

---

### Relationship to Other Measures

See Table 5.15 in Technical manual  
- Picture Concepts correlations range from low (.30 for Oral Expression) to moderate (.43 for Listening Comp)  
- Letter-Number Sequencing correlations were moderate across WIAT II subtests ranging from .39 (Oral Expression) to .60 (Math Reasoning)  
- Matrix Reasoning correlations ranged from .42 (Oral Expression) to .59 (Math Reasoning)  
- Cancellation correlated minimally with all WIAT II subtests  
- Word Reasoning correlations ranged from .62 (Listening Comprehension) to .42 (Oral Expression)

---

### Relationship to Other Measures

**Mean Scores for WISC IV and WAIS III**  
N=198 children, aged 16, mean interval 22 days

<table>
<thead>
<tr>
<th></th>
<th>WISC IV</th>
<th>WAIS III</th>
<th>Corrected $r_{12}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>VCI/VIQ</td>
<td>97.3</td>
<td>100.2</td>
<td>.86</td>
</tr>
<tr>
<td>PRI/PIQ</td>
<td>98.9</td>
<td>103.8</td>
<td>.85</td>
</tr>
<tr>
<td>WMI</td>
<td>98.7</td>
<td>97.7</td>
<td>.79</td>
</tr>
<tr>
<td>PSI/PSI</td>
<td>99.5</td>
<td>102.8</td>
<td>.77</td>
</tr>
<tr>
<td>FSIQ/FSIQ</td>
<td>98.5</td>
<td>101.6</td>
<td>.89</td>
</tr>
<tr>
<td>VCI/VCI</td>
<td>97.3</td>
<td>100.8</td>
<td>.85</td>
</tr>
<tr>
<td>PRI/POI</td>
<td>98.9</td>
<td>103.8</td>
<td>.73</td>
</tr>
</tbody>
</table>

---

### Relationship to Other Measures

- Table 5.16 Correlations with Children’s Memory Scales  
- Table 5.17 Correlations with Gifted Rating Scale (School Form)  
- Table 5.18 Correlations with BarOn EQ  
- Table 5.19—5.20 Correlations with Adaptive Behavior Assessment Scales—Second Edition

---

### Relationship to Other Measures

**Mean Scores for WISC IV and WASI**  
N=260 children, aged 6—16, mean interval 29 days

<table>
<thead>
<tr>
<th></th>
<th>WISC IV</th>
<th>WASI</th>
<th>Corrected $r_{12}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>VCI/VIQ</td>
<td>98.9</td>
<td>102.6</td>
<td>.85</td>
</tr>
<tr>
<td>PRI/PIQ</td>
<td>101.4</td>
<td>104.0</td>
<td>.78</td>
</tr>
<tr>
<td>WMI</td>
<td>100.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSI/PSI</td>
<td>98.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FSIQ/FSIQ</td>
<td>100.2</td>
<td>103.6</td>
<td>.86</td>
</tr>
<tr>
<td>FSIQ/FSIQ-2</td>
<td>100.2</td>
<td>102.0</td>
<td>.83</td>
</tr>
</tbody>
</table>
### Clinical Studies

#### Mental Retardation – Mild

<table>
<thead>
<tr>
<th>VCI</th>
<th>Mean</th>
<th>SD</th>
<th>Matched Control</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRI</td>
<td>67.1</td>
<td>9.1</td>
<td>98.7</td>
<td>12.5</td>
<td></td>
</tr>
<tr>
<td>WMI</td>
<td>66.8</td>
<td>11.1</td>
<td>99.4</td>
<td>13.8</td>
<td></td>
</tr>
<tr>
<td>PSI</td>
<td>73.0</td>
<td>11.6</td>
<td>98.3</td>
<td>13.5</td>
<td></td>
</tr>
<tr>
<td>FSIQ</td>
<td>60.5</td>
<td>9.2</td>
<td>99.2</td>
<td>13.6</td>
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</tr>
</tbody>
</table>

#### Mental Retardation – Moderate

<table>
<thead>
<tr>
<th>VCI</th>
<th>Mean</th>
<th>SD</th>
<th>Matched Control</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRI</td>
<td>52.3</td>
<td>7.5</td>
<td>97.2</td>
<td>14.1</td>
<td></td>
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<tr>
<td>WMI</td>
<td>52.5</td>
<td>9.2</td>
<td>99.2</td>
<td>15.2</td>
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</tr>
<tr>
<td>PSI</td>
<td>57.0</td>
<td>9.5</td>
<td>98.9</td>
<td>14.6</td>
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<tr>
<td>FSIQ</td>
<td>58.2</td>
<td>11.0</td>
<td>97.3</td>
<td>12.3</td>
<td></td>
</tr>
</tbody>
</table>

### Clinical Matched Controls

- Each clinical case is matched demographically to normal cases based on age, sex, ethnicity, parent education level, and geographic region.
- The mean of all normal cases that match each clinical case is used.

### Mental Retardation Study-1

#### Mild MR

<table>
<thead>
<tr>
<th>VCI</th>
<th>Mean</th>
<th>SD</th>
<th>Matched Control</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRI</td>
<td>65.5</td>
<td>10.3</td>
<td>98.7</td>
<td>15.2</td>
<td></td>
</tr>
<tr>
<td>WMI</td>
<td>66.8</td>
<td>11.1</td>
<td>99.4</td>
<td>13.8</td>
<td></td>
</tr>
<tr>
<td>PSI</td>
<td>73.0</td>
<td>11.6</td>
<td>98.3</td>
<td>13.5</td>
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</tr>
<tr>
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### Mental Retardation Study-2

#### Moderate MR

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Closer look at MR

1. Must consider both intellectual functioning and adaptive behavior.
2. The prevalence of large and unusual discrepancies between verbal and nonverbal composite scores has been shown to decrease with decreasing levels of ability (Slate, 1995; Spruill, 1996, 1998; Wechsler, 1997). Thus, there appears to be less variability in performance at both the composite (index) and the subtest levels for children with MR than for children in general population.
3. Children with MR also have relative strengths and weaknesses. Study with WISC III suggested that children with Mild MR may perform slightly better on measures of processing speed than on measures of verbal or perceptual-organization abilities (Wechsler, 1991).

LD - Math

<table>
<thead>
<tr>
<th>MD</th>
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<th>Diff</th>
<th>Signif</th>
<th>Effect</th>
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LD – Reading

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LD – Math

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Related Assessments in Development

- Co-Normed with WISC-IV PI
  - WISC-IV PI provides a number of standardized subtests and scores
  - Allows testing-of-limits supported by normative data
  - Multiple-choice version of Verbal subtests and Block Design
  - Spatial Span—Spatial Working Memory
  - Elithorn Mazes—Executive Function
  - Frequency of error types

LD - Reading

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<th>Effect</th>
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LD – Reading & Writing

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</table>
WISC IV

- Subtests and indexes with demonstrated clinical utility are provided.
- Usability of the test kit improved.
- Easy to administer and carry!
- Dedicated website.

WISC-IV Spanish Edition

- To be normed entirely in the U.S.
- Items adapted from WISC-IV
- Where adaptation is impossible, parallel items have been created.
- Standardization 2003
- We NEED your help!

Remember

Psychological assessment is a clinical activity that employs test scores, but only as one of the sources from which an astute clinician develops a well-integrated and comprehensive psychological portrait of the child examined.

In Summary

- The 4-factor model has been strengthened by adding new subtests that measure fluid reasoning, working memory and processing speed.
- The number of core subtests required (and, therefore, testing time) has been reduced.
- Floors, ceilings, and reliabilities improved on all subtests.

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