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Floor effects on the WISC-IV and WAIS-III

By

Simon Whitaker
and
Shirley Gordon
IQ tests

Wechsler Adult Intelligence Scale (WAIS)

Wechsler Intelligence Scale for Children (WISC)
Raw score and scaled scores

Raw score on subtests are converted to normalised scaled scores with a mean of 10, a standard deviation of 3 and a range between 1 and 19.
Sum of scaled scores

The IQ figure is calculated from the sum of scaled scores of all the subtests that measure IQ.
Floor effect 1:
Scaled score of 1 for low raw scores

WISC-IV Digit Span

Age group 16:00 to 16:30

Raw Score: 18 17 16 15 14 13 12 11 10 0-9
Scaled Score: 10 9 8 7 6 5 4 3 2 1

Age group 6:00 to 6:30

Raw Score: 11 10 8-9 7 6 5 - 4 3 0-2
Scaled Score: 10 9 8 7 6 5 4 3 2 1
Floor effect 2: Scaled score of 1 for raw scores of zero

Where there is a raw score of zero there is no indication what abilities, if any, the client has on the subtest.

The current manuals for the WISC-IV and WAIS-III suggest that if a client gets too many raw scores of zero, IQ scores should not be reported. For example on the WAIS-III a FS IQ should not be given unless the client has raw scores above zero on at least three Verbal and three Performance subtests.
Floor effect 3:
Allocating based IQs or Index scores to low sums
of scaled score.

WISC-IV FS IQ

<table>
<thead>
<tr>
<th>SSS:</th>
<th>22 21 20 19 18 17 16 15 14-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSIQ:</td>
<td>45 44 44 43 42 42 41 41 40</td>
</tr>
</tbody>
</table>

WAIS-III FS IQ

<table>
<thead>
<tr>
<th>SSS:</th>
<th>25 24 23 22 21 20 19 18 17 16-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSIQ:</td>
<td>50 50 49 49 48 48 47 46 46 45</td>
</tr>
</tbody>
</table>
Whitaker and Wood (2008)

50 WISC-III: Mean FSIQ 58.04; SD 9.92
49 WAIS-III: Mean FSIQ 65.20; SD 7.03
Frequency of WAIS-III scaled scores
Frequency of WISC-III scaled scores
Proportion of scaled scores on WAIS-III for IQs in 50s
Proportion of scaled scores on WAIS-III for IQs in 60s
Proportion of scale scores on WAIS-III for IQs in 70s
Percentage of scaled scores on WISC-III for IQs in 40s
Percentage of scale scores on WISC-III for IQs in 50s
Percentage of scale scores on WISC-III for IQs in 60s

![Bar chart showing the proportion of scale scores for IQs in the 60s.](chart.png)
Percentage of scale scores on WISC-III for IQs in 70s
Criteria for Scaled Score 2 on WISC-III and WAIS-III

Coding

WISC-III | WAIS-III
---|---
raw score 39 | raw score 14
Criteria for Scaled Score 2 on WISC-III and WAIS-III

<table>
<thead>
<tr>
<th>WISC-III Block Design</th>
<th>WAIS-III Block Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw score 29</td>
<td>Raw score 3</td>
</tr>
<tr>
<td>Completion of one 2-block model and six 4-block models gaining full bonus points for time on three of the models.</td>
<td>Completion of two 2-block models, being given a second trial on one model if an error occurred on the first trial.</td>
</tr>
</tbody>
</table>

Gave the WISC-IV and WAIS-III to seventeen 16-year-olds in special education.

<table>
<thead>
<tr>
<th></th>
<th>WISC-IV</th>
<th>WAIS-III</th>
<th>dif</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>FS IQ</td>
<td>53.00</td>
<td>64.82</td>
<td>11.82</td>
<td>.93</td>
</tr>
</tbody>
</table>
Distribution of Scaled Scores WAIS-III
Distribution of Scaled Scores corrected for Floor Effect
(WAIS-III)
Distribution of Scaled Scores (WISC-IV)
Distribution of Scaled Scores Corrected for Floor Effect (WISC-IV)
### WISC-IV

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Uncorrected WISC FS IQ</th>
<th>Corrected WISC FS IQ</th>
<th>Difference in FS IQs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>41</td>
<td>25</td>
<td>16</td>
</tr>
<tr>
<td>2</td>
<td>58</td>
<td>56</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>57</td>
<td>54</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>40</td>
<td>13</td>
<td>27</td>
</tr>
<tr>
<td>5</td>
<td>54</td>
<td>54</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>60</td>
<td>60</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>55</td>
<td>54</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>40</td>
<td>26</td>
<td>14</td>
</tr>
<tr>
<td>9</td>
<td>72</td>
<td>72</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>60</td>
<td>60</td>
<td>0</td>
</tr>
<tr>
<td>11</td>
<td>58</td>
<td>58</td>
<td>0</td>
</tr>
<tr>
<td>12</td>
<td>52</td>
<td>52</td>
<td>0</td>
</tr>
<tr>
<td>13</td>
<td>40</td>
<td>25</td>
<td>15</td>
</tr>
<tr>
<td>14</td>
<td>40</td>
<td>9</td>
<td>31</td>
</tr>
<tr>
<td>15</td>
<td>48</td>
<td>42</td>
<td>6</td>
</tr>
<tr>
<td>16</td>
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<td>0</td>
</tr>
<tr>
<td>17</td>
<td>68</td>
<td>68</td>
<td>0</td>
</tr>
</tbody>
</table>

**Mean**

- Uncorrected: 53.0
- Corrected: 46.0
Conclusions

• WAIS-III floor effect could be corrected.
• The accuracy of the WISC-IV must be severely compromised by floor effects.
• WISC-IV floor effect should be corrected but it is not clear by how much.