Long-Term Stability of Process Scores in the French WISC-IV

KIENG, Sotta, et al.

Abstract

In order to provide clinicians with a more thorough understanding of child’s performance on Block Design, Digit Span and Cancellation, seven process scores are included in the Wechsler Intelligence Scale for Children-Four edition (WISC-IV): Block Design No Time Bonus (BDN), Digit Span Forward (DSF), Digit Span Backward (DSB), Longest Digit Span Forward (LDSF), and Longest Digit Span Backward (LDSB). For relevance of prognostic statements, it is essential to rely on test scores that are stable across time. The goal of this study was to explore the long-term stability of the WISC-IV process scores (BDN, DSF, DSB, LDSF, and LDSB). The sample consisted of 277 nonclinical French-speaking Swiss children aged between 7 and 12 years (at first testing: mean age = 8.87 and SD = 0.82; at second testing: mean age=10.64 and SD = 1.11). The WISC-IV were administered twice in an average test-retest interval of 1.77 years (SD = 0.56).

Reference


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http://archive-ouverte.unige.ch/unige:76718

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Long-Term Stability of Process Scores in the French WISC-IV

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INTRODUCTION

- The Wechsler Intelligence Scale for Children-fourth edition (WISC-IV) is frequently used to assess a child’s overall intellectual ability. The clinical interpretation based on a Full Scale Intelligence Quotient (FSIQ) and 4 indices (Verbal Comprehension Index: VCI; Perceptual Reasoning Index: PRI; Processing Speed Index: PSI; and Working Memory Index: WMI) allows the practitioners to develop hypotheses regarding normative and personal strengths and weaknesses.
- In addition to FSIQ and the 4 index scores, 7 process scores are also yielded: Block Design No Time Bonus (BDN), Digit Span Forward (DSF), Digit Span Backward (DSB), Longest Digit Span Forward (LDSF), and Longest Digit Span Backward (LDSB). The LDSF score is the number of digits correctly repeated on the last forward trial, and the LDSB is the number of digits correctly repeated on the last backward trial.
- The process scores provide clinicians with a more thorough understanding of child’s performance on visual-spatial processing, working memory, and processing speed.

OBJECTIVE

The goal of this study was to explore the long-term stability of the WISC-IV process scores (BDN, DSF, DSB, LDSF, and LDSB) with an average Test (T1) – Retest (T2) interval of 1.77 years (SD = 0.56 years; range from 1 to 3.25 years).

METHOD

- 277 non-clinical French-speaking Swiss children;
- Aged between 7 and 12 years;
- All of them had proficiency in speaking, understanding, and reading French;
- None of them has doubled or skipped class;
- Relatively representative of the Geneva children’s population (sex, SES).

<table>
<thead>
<tr>
<th>Sample</th>
<th>N</th>
<th>Mean Age T1 (SD)</th>
<th>Mean Age T2 (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Girls</td>
<td>145</td>
<td>8.93 (0.81)</td>
<td>10.69 (1.06)</td>
</tr>
<tr>
<td>Boys</td>
<td>132</td>
<td>8.79 (0.86)</td>
<td>10.58 (1.17)</td>
</tr>
<tr>
<td>Total sample</td>
<td>277</td>
<td>8.87 (0.82)</td>
<td>10.64 (1.11)</td>
</tr>
</tbody>
</table>

- The 10 core subtests and the subtest Picture Completion of the WISC-IV were administered twice to each child.
- The 7 process components of BDN, DSF, DSB, LDSF, and LDSB were computed according to the instructions reported in the WISC-IV Administration and Scoring Manual.
- For BDN, DSF, and DSB, the individual changes in scores across the retest interval were explored within standard error of measurement (SEM). More precisely, a score was considered stable across the retest interval when performances remained within ±2 SEM. Thus, approximately 95% of the retest scores should be foreseen within ±2.94, ±2.54, and ±2.96 points of the initial score for BDN, DSF, and DSB, respectively.
- For LDSF and LDSB, individual changes were presented with use of number of children which earned identical scores at both assessments.

RESULTS

- Mean Full Scale IQ was 100.81 (SD = 13.94) at T1 and 103.34 (SD = 12.78) at T2.
- At an interindividual level, stability coefficients of process scores ranged from .29 on LDSB to .66 on BDN.
- At an intra-individual level, less than 70% of children had their process scores within a confident interval of ±2 SEM between the two assessments. Thus, the predictions will be correct for less than seven children of ten.

<table>
<thead>
<tr>
<th></th>
<th>M (SD)</th>
<th>M (SD)</th>
<th>r</th>
<th>p</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>BDN</td>
<td>11.03 (3.09)</td>
<td>10.83 (3.06)</td>
<td>.66</td>
<td>0.19</td>
<td>0.07</td>
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<tr>
<td>DSF</td>
<td>9.37 (2.59)</td>
<td>9.91 (2.83)</td>
<td>.52</td>
<td>&lt;0.01</td>
<td>-0.20</td>
</tr>
<tr>
<td>DSB</td>
<td>9.86 (2.60)</td>
<td>9.71 (2.92)</td>
<td>.32</td>
<td>0.43</td>
<td>0.05</td>
</tr>
<tr>
<td>LDSF</td>
<td>4.93 (0.93)</td>
<td>5.48 (1.06)</td>
<td>.47</td>
<td>&lt;0.01</td>
<td>-0.55</td>
</tr>
<tr>
<td>LDSB</td>
<td>3.51 (0.83)</td>
<td>3.92 (1.04)</td>
<td>.29</td>
<td>&lt;0.1</td>
<td>-0.44</td>
</tr>
</tbody>
</table>

- For LDSF and LDSB, only 34.7% and 38.6% of children earned identical scores at both assessments.

CONCLUSION

- In line with Ryan, Umfleet, and Kane (2013), our findings on a sample of 277 nonclinical children suggested that the process scores were not stable in long-term.
- At an interindividual level, results showed low stability coefficients for all process scores (r < .70).
- At an intra-individual level, more than 30% of the children earned BDN, DSF, and DSB scores that differed by more than ±2 SEM points between the two testsings.
- Caution should be exercised in the interpretation of these process scores. It is not recommended to use them for individual predictions, but for the interpretations in the here and now.

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