Analysis of the French WISC-IV index score scatter and level of performance with gifted and non gifted children

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INTRODUCTION

- The WISC-IV is one of the most appropriate IQ tests for identifying children who are intellectually gifted.
- While the FSIQ is useful in the assessment and the classification of intellectually gifted children, the index scores allow for a better understanding of the child functioning, the learning profile.
- However, some authors suggested that subtest scatter invalidates the FSIQ, and that scatter was higher for gifted children than for non-gifted children; thus, scatter analysis should be considered.
- Some studies have shown that CHC-based model better fits the WISC-IV than the current four-factor index, thus, five CHC composite scores were calculated (Gf, Gc, Gv, Gsm, and Gs).

OBJECTIVE

- The main objective was to compare gifted and non-gifted children for:
  1. Mean level of performance: standard and CHC scores
     - Gifted > non-gifted for VCI, PRI, Gc, GF, and Gv
     - Gifted = non-gifted for WMI, PSI, Gsm, and Gs
  2. Index score scatter (variability): standard and CHC scores
     - Scatter higher for gifted than for non-gifted children
  3. Index score discrepancies: standard and CHC scores
     - Performances between index scores are more heterogeneous for gifted than for non-gifted children.

METHOD

Samples
- 25 gifted children (13 boys, age = 10.29 years; FSIQ = 128.68, SD = 5.19)
- 25 non-gifted children (13 boys, age = 10.29 years; FSIQ = 104.00, SD = 6.38)
- Gifted and non-gifted were matched for age, sex, and socioeconomic status. Children were aged from 8 to 12 years.

Material
- All subtests of the WISC-IV (10 core and 5 optional) were administered to all children.
- Standard indexes: Verbal Comprehension (VCI), Perceptual Reasoning (PRI), Processing speed (PSI), Working memory (WMI), and Full Scale Intelligence Quotient (FSIQ).
- Five CHC composite scores: Comprehension-Knowledge (Gc: Similarities + Comprehension), Fluid reasoning (Gf: Picture Concepts + Matrix Reasoning), Visual Processing (Gv: Block Design + Picture completion), Short-term memory (Gsm: Digit Span + Letter-Number Sequence) and Processing Speed (Gs: Coding + Symbols Search).

Scatter analysis
- Index score scatter: difference between the highest and the lowest subtest score within each index score
- Index score discrepancies: all pairwise comparisons with Bonferroni correction (VCI vs. PRI, etc.)
- Difference between each index score and the mean index score

RESULTS

1) Level of performance (Bonferroni correction)

2) Index score scatter (Bonferroni correction)

3) Index score discrepancies (Bonferroni correction)

4) Discrepancies between index and average index score

CONCLUSIONS

1. Gifted children performed better than non-gifted for all composite scores, except for Gv (with Bonferroni correction).
2. Gifted and non-gifted children display similar scatter; Index score scatter was not higher for gifted than for non gifted.
3. Only discrepancy between Gc and Gv was higher for gifted children than for non-gifted children.
4. Gifted children demonstrated a higher dispersion of VCI or Gc around the mean index score (ipsative strength).
   - In sum, Gifted children demonstrated better performance than non gifted children but scatter was similar for both groups. Gifted children are not more heterogeneous than non gifted children.
   - Subtest scatter does not invalidate FSIQ more frequently for gifted than for non gifted children.

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