A Cluster Analytic Investigation of the WISC-IV Core and Supplemental Subtests in Children Referred for Psychoeducational Assessment

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Abstract

WISC-IV subtest scores (core plus Picture Completion, Information, and Arithmetic) of 115 students referred for academic difficulties were cluster analyzed to determine if reliable and valid subgroups would emerge. Three reliable subgroups were identified. The mean subtest profiles of the derived clusters were consistent with those found in studies using previous WISC editions. Clusters reflecting weaknesses in visual processing (G*v*) and fluid reasoning (G*f*) did not emerge. Picture Concepts was one of the highest scores in every cluster.

Rationale

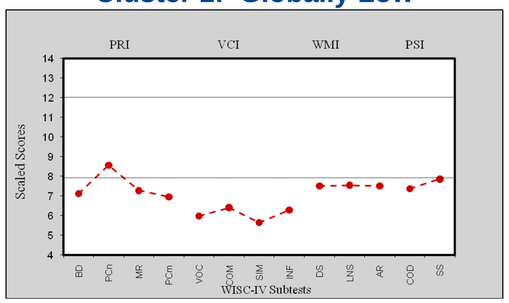
Empirical clustering studies have identified distinct subtest profiles using earlier WISC editions. The generalizability of this research to the WISC-IV is unclear.

In an earlier study using only the 10 core WISC-V subtests, 3 reliable subgroups were empirically derived: Globally Low, Low VCI, and LOW WMI and PSI. Unexpectedly, no low PRI group was identified.

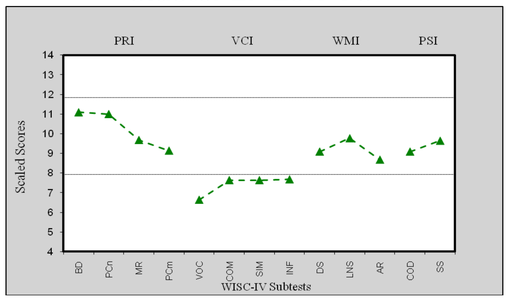
Some research suggests that the PRI measures two distinct processes: Fluid reasoning (G*f* ; Matrix Reasoning, Picture Concepts, and Arithmetic), and visual processing (G*v*; Block Design and Picture Completion).

Three supplemental subtests were included in the current cluster analysis in part to determine if profiles reflecting subtest variations consistent with G*v* and G*f* would emerge.

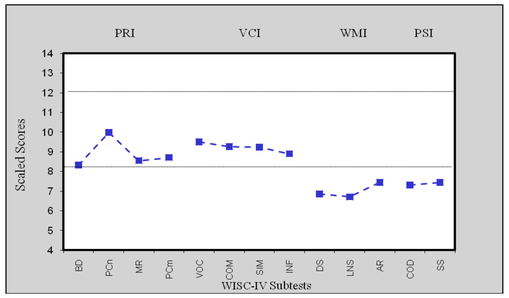
Cluster 1: Globally Low



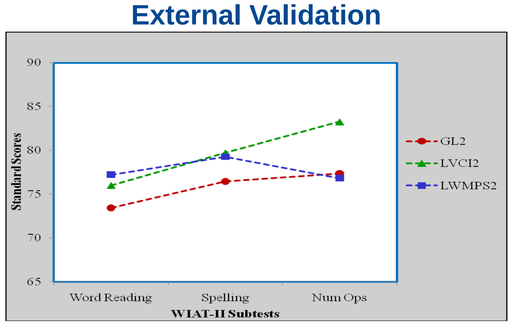
Cluster 2: Low VCI



Cluster 3: Low WMI and PSI



External Validation



Method

Participants:

115 children referred for psychoeducational assessment due to persistent academic difficulties: Ages: 8 – 16 yrs; FSIQ: 70 – 130.

Procedures:

Scaled subtest scores were subjected to hierarchical (Ward's Method with Squared Euclidean Distance) and K-means iterative partitioning cluster analyses.

Reliability of the final cluster solution was examined via multiple method techniques using Cohen's Kappa and Intraclass Correlation Coefficients.

External validity of the final cluster solution was examined by comparing the groups on WIAT-II Word Reading, Spelling, and Numerical Operations subtests.

Results & Conclusions

The final 3-cluster solution was stable across hierarchical and K-means analyses ($p < .001$), as well as across four hierarchical methods ($p < .05$).

Groups did not differ significantly on WIAT-II subtests.

The derived clusters were similar to those reported in previous research.

Clusters characterized by subtest score variations reflecting G*f* and G*v* did not emerge, failing to support this interpretation of the PRI.

The Picture Concepts subtest was one of the highest subtests in every cluster, calling into question the cognitive processes being tapped by this measure.

Presented at the 39th Annual Meeting of the International Neuropsychological Society

Boston, Massachusetts, February, 2011