Cluster Analysis of the WIAT-II in a School-referred Sample

Jennifer Long[1], Vilija M. Petrauskas[1], Joseph E. Casey[1], & Erin Picard[2]

[1]Department of Psychology & [2]Windsor-Essex Catholic District School Board

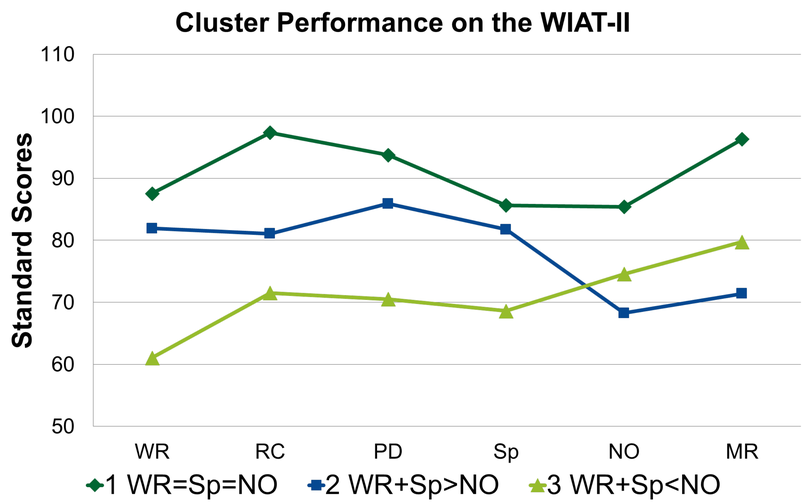
University of Windsor
thinking forward

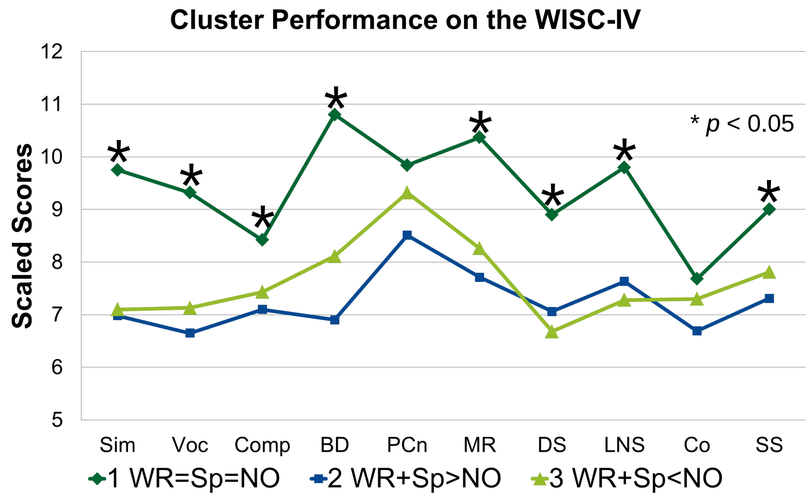
Introduction

- Studies in the past have outlined patterns of both cognitive and academic performance in children, using the original version of the Wide Range Achievement Test
- Three distinct subtypes of children experiencing academic difficulties were determined by examining academic profiles of children with different cognitive strengths (e.g., VIQ > PIQ)
- These groups were:
  - Good reading and spelling
  - Good arithmetic
  - Relatively equal reading, spelling, and arithmetic
- The purpose of the present study was to explore through cluster analysis whether the same profiles could be replicated using a more recent measure, the Wechsler Individual Achievement Test – Second Edition (WIAT-II)
- The second purpose was to determine whether the clusters could be externally validated

Methods

- 118 children (88 boys, 30 girls), referred for psychological assessment through their school were included in analyses (mean age = 11.31 [SD=1.93], mean FSIQ = 83.80 [SD=9.69])
- WIAT-II Word Reading (WR), Reading Comprehension (RC), Pseudoword Decoding (PD), Spelling (Sp), Numerical Operations (NO), and Math Reasoning (MR) scores were subject to a hierarchical cluster analysis
  - Ward's method and squared Euclidean distance were used to determine clusters
- K-means clustering was then used to verify the solution
- The resulting clusters were compared on their performance on the WISC-IV using MANOVA





Results

- Three WIAT-II clusters were identified:
  1. Similar Word Reading (WR), Spelling (Sp), and Numerical Operations (NO), (WR=Sp=NO)
  2. Better WR and Sp, lower NO (WR+Sp>NO)
  3. Lower WR and Sp, better NO (WR+Sp<NO)
- The final 3-cluster solution was stable across hierarchical and K-means analyses ($p < .05$) as well as across four hierarchical methods ($p < .05$)
- There were significant differences between the clusters on the WISC-IV (F [10,220] = 6.47, p = 0.0, Wilk's λ = .597)
  - Cluster 1 was significantly higher than Clusters 2 and 3 on the VCI, WMI, and FSIQ
  - There were no significant differences between any of the clusters on the PRI and PSI
  - Clusters 2 and 3 were not significantly different on any of the Indexes

Discussion & Conclusions

- This study replicated using cluster analysis, the academic profiles seen in previous studies with the WRAT
- Compared to original studies, three clusters with similar patterns but less severity of impairment were identified with the WIAT-II (compared to the WRAT)
- Clusters were externally validated using the WISC-IV
- The WIAT-II cluster that did relatively well across WIAT-II subtests (Cluster 1), also did relatively well across all WISC-IV subtests when compared to the other two clusters
- The two clusters that showed lower performance on the WIAT-II also showed lower performance on the WISC-IV

Presented at the 31st Annual Meeting of the National Academy of Neuropsychology

Marco Island, Florida, November, 2011