

Attention Please!

Dimensions of Attention Deficit

Everett V. Smith, Jr., Ph.D.

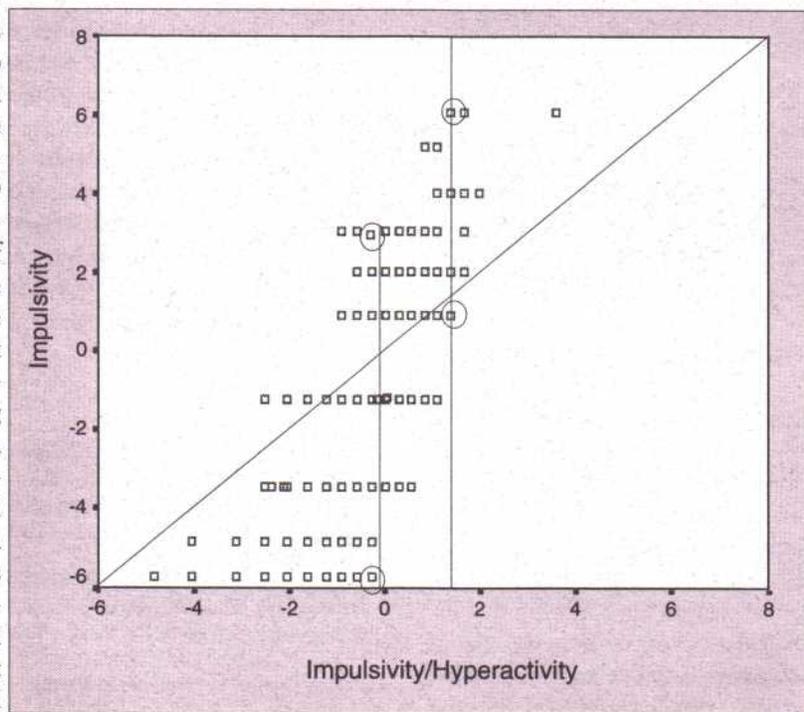
The University of Illinois at Chicago

ADHD is characterized by inattentiveness (e.g., failing to finish schoolwork), impulsivity (e.g., interrupting conversations), and hyperactivity (e.g., always "on the go"). Investigations into the dimensionality of ADHD have stopped at gaining evidence to support the diagnostic subtypes advocated by the DSM-IV (i.e., Inattentive, Impulsive/Hyperactive, and combined Inattentive and Impulsive/Hyperactive) (APA, 1994). This paper demonstrates how to use features found in WINSTEPS to examine the Impulsivity/Hyperactivity dimension of ADHD and investigates the existence and potential utility of secondary dimensions. The data (n=317) used were obtained with the Adult Behavior Checklist - Revised (ABC-R), a screening assessment for ADHD in college students. The ABC-R addresses concerns noted by Smith and Johnson (1998) that several items on the original Adult Behavior Checklist contained more than one concept (e.g., work and school) and should be divided into two separate items.

The seven items representing Impulsivity/Hyperactivity (Table 1) fit the Rasch Rating Scale model. The correlations among standardized residuals were then analyzed into principal components. The purpose of this analysis was to investigate if order exists among the information remaining in the

standardized residuals after accounting for the primary dimension of Impulsivity/Hyperactivity. Two sets of items emerged from this analysis. Set one included: "You act as if you are 'on the go'" and "You act as if 'driven by a motor.'" The behaviors in set two were: "You blurt out answers before questions have been completed," "You have difficulty awaiting your turn," and "You interrupt others (e.g., butt into conversations or activities)."

The behaviors in set one seem to represent a secondary dimension of Hyperactivity; set two, Impulsivity. How useful are these two dimensions compared to the combined Impulsivity/Hyperactivity dimension already constructed by the Rasch analysis? By anchoring the items within each set at the calibrations found in the construction of the Impulsivity/Hyperactivity dimension, one is able to estimate measures for each of the secondary dimensions on the same scale that was constructed for the Impulsivity/Hyperactivity dimension. A simple bivariate plot of



measures from the secondary dimensions and measures from the Impulsivity/Hyperactivity dimension will show whether measures from the secondary dimensions have clinical value.

Figure 1 plots measures from the Impulsivity/Hyperactivity dimension against measures from the Hyperactivity dimension. Examine for example, the participants with estimated

measures of -1.23 logits ($n=24$, each point represents more than one individual) on the primary dimension of Impulsivity/Hyperactivity. These participants would not be candidates for further evaluation because their measures are below the suggested cutoff of 1.60 logits. However, look at the range of their measures on the Hyperactivity dimension. The values range from -6.98 to 4.52 logits. Based on these secondary measures, several participants may need assistance with specific aspects of this disorder. Now examine the participants with estimated measures of 1.66 logits ($n=4$). These participants are candidates for further evaluation. Their corresponding measures on the Hyperactivity dimension range from -.77 to 4.52 logits. Participants with low measures on the Hyperactivity dimension may not need the more comprehensive evaluation to address these types of symptoms. Similar interpretations can be made from the information in Figure 2, which plots measures from the Impulsivity/Hyperactivity dimension against measures from the Impulsivity dimension. From the information in these Figures, it appears that interpretation of measures from the Impulsivity/Hyperactivity dimension without regard to measures from secondary dimensions may direct the evaluation and treatment of symptoms associated with ADHD.

It is hoped that this example will encourage researchers to 'dig' deeper in their investigations of dimensionality rather than terminating their investigations once support for a priori dimensions is obtained. First, the additional information found in the secondary dimension has the potential for enhancing a clinician's ability to evaluate symptoms and plan appropriate interventions. Second, the details provided by the secondary dimensions may assist with the interpretation of the theoretical constructs associated with the disorder under investigation.

References

- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, D.C.: Author.
- Smith, Jr., E.V., & Johnson, B.D. (1998). Factor Structure of the DSM-IV Criteria for College Students using the Adult Behavior Checklist. *Measurement and Evaluation in Counseling and Development*, 31, 164-183.

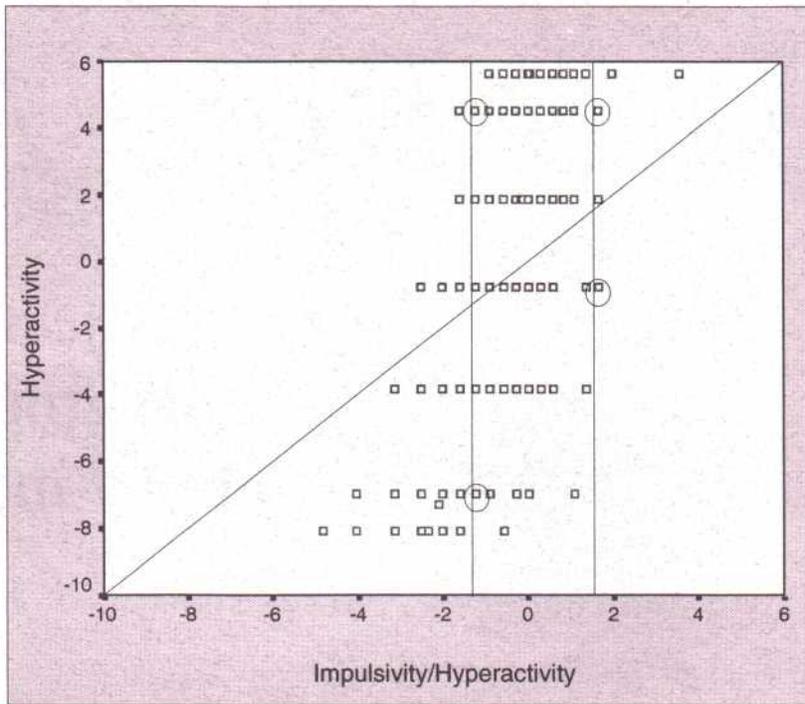
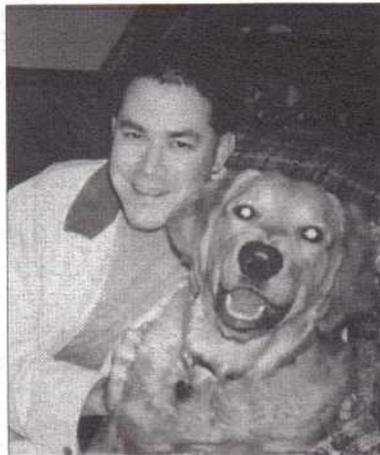


Table 1

Items for the Impulsive/Hyperactive dimension

- You have difficulty remaining quiet during leisure activities.
- You act as if you are "on the go."
- You act as if "driven by a motor."
- You talk excessively.
- You blurt out answers before questions have been completed.
- You have difficulty awaiting your turn.
- You interrupt others (e.g., butt into conversations or activities).



Everett Smith is an Assistant Professor of Educational Psychology at the University of Illinois, Chicago. He has recently developed a Ph.D. curriculum in Applied Measurement and Statistics that will begin accepting students in the Fall of 1999. The measurement aspect of the new curriculum will focus on objective measurement theory and applications. Current research interests include the development of a screening assessment for Attention Deficit Hyperactivity Disorder and the measurement of study skills self-efficacy in community college students. Other interests include biking, tennis, and spending time with Calvin (pictured) and Hobbes. Please e-mail me with any questions: evsmith@uic.edu