The Woodcock-Muñoz Foundation

Research Brief
Doctoral Dissertation Abstract

VISUAL-SPATIAL PROCESSING AND MATHEMATICS ACHIEVEMENT: THE PREDICTIVE ABILITY OF THE VISUAL-SPATIAL MEASURES OF THE STANFORD-BINET INTELLIGENCE SCALES, FIFTH EDITION AND THE WECHSLER INTELLIGENCE SCALE FOR CHILDREN-FOURTH EDITION

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Abstract

In the law and the literature there has been a disconnect between the definition of a learning disability and how it is operationalized. For the past 30 years, the primary method of learning disability identification has been a severe discrepancy between an individual's cognitive ability level and his/her academic achievement. The recent 2004 IDEA amendments have included language that allows for changes in identification procedures. This language suggests a specific learning disability may be identified by a student's failure to respond to a research based intervention (RTI). However, both identification methods fail to identify a learning disability based on the IDEA 2004 definition, which defines a specific learning disability primarily as a disorder in psychological processing. Research suggests that processing components play a critical role in academic tasks such as reading, writing and mathematics. Furthermore, there has been considerable research that suggests visual-spatial processing is related to mathematics achievement. The two most well known IQ tests, the Stanford-Binet-Fifth Edition (SB5) and the Wechsler Intelligence Scale for Children-Fourth Edition (WISC-IV), were revised n 2003 to align more closely with the most current theory of intelligence, the Cattell-Horn-Carroll theory of cognitive abilities (CHC). Research supports both instruments have subtests that measure visual-spatial processing. The purpose of the current study is to identify which visual-spatial processing measure (SB5 or WISC-IV) is the better predictor of poor mathematics achievement. The participants were 112 6^{th}-8^{th} grade middle school students. Of the 112 original participants, 109 were included in the study. The comparison of the results of two separate sequential logistic regressions found that both measures could significantly predict mathematics achievement.

However, given the relatively small amount of variance accounted for by both the SB5 and the WISC-IV visual-spatial measures, the results had questionable practical significance.

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