

Neuropsychology Abstracts

Title: MATH COMPONENTS IN SPINA BIFIDA MYELOMENINGOCELE

Presenting Author: Paul Cirino, University of Houston - Texas Medical Center Annex

Additional Authors:

- Marcia Barnes, University of Texas Health Science Center at Houston

Background: Math difficulty in Spina Bifida is high, and more common than difficulties with reading. Fact retrieval is a core deficit in math difficulty. The present study compares fact retrieval performance in individuals with Spina Bifida to controls, compares exact addition performance to a similar estimation task, and relates these skills to broader math skill. We hypothesized group differences on exact addition, and given greater difficulties with assembled vs. associative processes in Spina Bifida (Dennis et al., 2006), we also expect relatively greater difficulty on approximate versus exact addition. Exact and approximate addition, and reading performance, was expected to impact broader math skills.

Method: 105 individuals with Spina Bifida (age 13.1, SD=2.6) were seen as part of a larger study neurobehavioral variability within this population. There were 29 similarly aged controls. Measures included a computerized task of exact and approximate addition, WJ subtests of Calculations and Math Fluency, and SB:FE Quantitative Reasoning.

Results: There were group differences for small sums exact ($d = +0.43$) and approximate ($d = +0.53$) accuracy. Performance was also below controls for small sums exact response times ($p < .05$). The approximate accuracy differences remained even when reading performance was considered. No differences were noted for large sum problems. Individuals with Spina Bifida performed below controls on Calculations, Math Fluency, and Quantitative Reasoning (all $p < .05$). Small sums exact accuracy and response times, and reading performance, were significant predictors for calculations and math fluency, though not for quantitative reasoning.

Conclusion: Differences between groups were most apparent on small sum exact and approximate problems, and results for exact addition were accounted for by decoding performance. Exact addition (and reading skill) were significant predictors of broader math performance. Results suggest that remediation in foundational skills such as fact retrieval may assist with the development of computational skill, but more conceptual aspects of math skill likely requires a different approach.