Domain-specific and domain-general effects on strategy selection in complex arithmetic: Evidences from ADHD and normally developed college students

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Abstract
The solution of multi-digit addition problems involves numerous strategies (e.g., retrieval or backup strategies). Here, we investigated the role of domain specific factors related to math ability, versus domain general factors such as executive functions on strategy selection and accuracy in complex addition problems. In order to examine the role of domain general processing, typically developed college students were compared to Attention-Deficit Hyperactivity Disorder (ADHD) students due to the ADHD deficits in executive function and sustained attention. We discovered that both domain specific factors and domain general factors play a significant role in the strategy selection process and accuracy. Importantly, domain specific and domain general abilities uniquely impact the complex arithmetical condition (carry over; e.g., 59+63) but not the simple arithmetical condition (non-carry; e.g., 52+63). Hence, the present finding suggests that superior executive function or superior sustained attention abilities can serve as a compensatory mechanism to low approximate number system acuity.