

Dr Julie Kable  
Emory University School of Medicine  
1256 Briarcliff Rd  
Atlanta, GA 30306  
USA  
Email: jkabl01@emory.edu

### **Prenatal alcohol exposure and math disability: Investigating the cognitive components of the deficit**

Julie A. Kable\* (Department of Pediatrics, Emory University School of Medicine, Atlanta, GA, USA)  
Claire D. Coles (Department of Psychiatry and Behavioral Sciences and Pediatrics, EUSM, Atlanta, GA, USA), and Mary Ellen Lynch (Department of Psychiatry and Behavioral Sciences, EUSM, Atlanta, GA)

Prenatal alcohol exposure often leads to global cognitive deficits that impact academic and vocational functioning. Mathematical skills have been shown to be a differential deficit in that performance is often lower than would be anticipated from the deficits in general intelligence. The current study evaluated a model of math functioning that included global ability, visual memory, executive functioning, working memory and processing speed, all of which have been implicated as affected by prenatal exposure. Intellectual and academic performance was evaluated in 179 adolescents (M age=15.1 yrs), including 127 prenatally exposed to alcohol (with 46 showing physical effects), and 52 unexposed controls. Ability was assessed using the Wechsler Intelligence Scale for Children, 3rd Ed. (WISC-III), including the Boston Revision, and achievement using the Wechsler Individual Ability Test (WIAT). Executive functioning was measured with the Progressive Planning Task (PPT) and the visual memory was assessed using the Taylor-Freides Figure Recall Task. The WISC-III Boston Revisions provided an estimate of working memory using the Backwards Digit Span and of processing speed from the four factor scores of this instrument. After controlling for intelligence, alcohol-related dysmorphia continued to be negatively related to math scores and processing speed but was not related to visual memory, executive planning, or working memory. Alcohol-related dysmorphia no longer accounted for unique variance in math skills after removing variance associated with intelligence and processing speed, suggesting that these cognitive skills may mediate the negative relationship between prenatal alcohol exposure and math performance.