

# **AMPLIFIED PREFRONTAL NEURAL FUNCTIONING IN COGNITIVE CONTROL IS ASSOCIATED WITH ENHANCED WORKING MEMORY IN CHILDREN**

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In a model of prefrontal cortical functioning in cognitive control, Braver and colleagues utilized the AX-Continuous Performance Task (CPT) to highlight the relationship between proactive control and working memory in young and old adults. Specifically, working memory performance has been modeled as a proactive strategy in cognitive control (Braver, T.S., Gray, J.R., and Burgess, G.C., 2007).

Our study examined the relationship between proactive control and working memory in children (aged 7-17) using event-related potentials and the AX-CPT. Specifically, we examined N2 amplitudes, a mediofrontal component that has been associated with aspects of cognitive control. We further inspected working memory capacity using the WAIS Digit Span, both forward and backwards. Results revealed that better digit span performance was associated with higher task performance (Forward:  $\beta = .523$ ,  $t(14) = 2.30$ ,  $p = 0.037$ ) and greater (more negative) N2 amplitudes (Forward:  $\beta = -0.70$ ,  $t(14) = -3.07$ ,  $p = 0.010$ ; Backward:  $\beta = -0.78$ ,  $t(14) = -2.07$ ,  $p = 0.061$ ).

These results indicate that enhanced working memory is associated with the recruitment of more prefrontal cortical resources. These results have implications for the evaluation of targeted working memory training programs in children.

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Braver, T. S., Gray, J. R., & Burgess, G. C. (2007). Explaining the many varieties of working memory variation: Dual mechanisms of cognitive control. *Variation in working memory*, 76-106.