Anxiety and children's mathematics academic performance: The role of working memory

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Abstract

High levels of anxiety have been linked to children's academic underachievement, particularly mathematics. Within the Attentional Control Theory framework (Eysenck, Derakshan, Santos, & Calvo, 2007), anxiety's interference with working memory functioning represents a potential mechanism that may account for anxiety's detrimental effect on academic performance. Indirect evidence derives from studies showing that children with greater working memory capacities also display better math performances. The current research set out to investigate whether associations between anxiety and mathematics academic underachievement were mediated via children's poor working memory performance. Children aged between 9 and 11 years were evaluated using a measure of trait anxiety, their school academic data, as well as a complex reading-operation working memory span task (N = 66; 39 girls). Results from a mediation analysis indicated that anxiety did not directly influence children's math attainment after taking into account their working memory performance, but was indirectly associated with children's poor math academic performance through its relationship with poor working memory span. Thus, findings suggest that working memory represents a specific mechanism accounting for anxiety's detrimental effect on math academic achievement, which could be considered in educational interventions for children with higher levels of anxiety. Aside from improving cognition and school performance, such interventions could provide high-anxious children with a more efficient buffer against anxiety's detrimental effects on academic achievement.

Keywords: math anxiety; math attainment; math performance; mathematics; working memory span.