

## A Randomized Controlled Intervention Study of the Effect of Music Training on Mathematical and Working Memory Performances

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**Abstract :** The present experimental study examined the effects of music and math training on mathematical skills and visuospatial working memory capacity in kindergarten children. For this purpose, N = 54 children (mean age: 5.46 years; SD = .29) were randomly assigned to three groups. Children in the music group (n = 18) received weekly sessions of 60 min music training over a period of eight weeks, whereas children in the math group (n = 18) received the same amount of training focusing on mathematical basic skills, such as numeracy skills, quantity comparison, and counting objectives. The third group of children (n = 18) served as waiting controls. The groups were matched for sex, age, IQ and previous music experiences at baseline. Pre-Post intervention measurements revealed a significant interaction effect of group x time, showing that children in both music and math groups significantly improved their early numeracy skills, whereas children in the control group did not. No significant differences between groups were observed for the visuospatial working memory performances. These results confirm and extend previous findings on transfer effects of music training on mathematical abilities and visuospatial working memory capacity. They show that music and math interventions are similarly effective to enhance children's mathematical skills. More research is necessary to establish, whether cognitive transfer effects arising from music interventions might facilitate children's transition from kindergarten to first-grade.

**Keywords :** music training, mathematical skills, working memory, transfer

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