

**Associations between musical and linguistic abilities at the beginning of schooling:  
A preliminary study with first-grade children**

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**Abstract**

Although several studies have proved the positive impacts of out-of-school music training on basic cognitive and linguistic abilities, only a few music interventions have investigated the possible benefits of curriculum-based music education in school contexts. As part of a longitudinal study, we explored musical and cognitive abilities in first-grade elementary school children. This preliminary, quasi-experimental, cross-sectional assessment aimed to evaluate the baseline of musical abilities and cognitive functioning in children at the beginning of formal school education. Participants were 6- to 7-year-old children from the same school: students attended to the class with a special music curriculum or the class with a special mathematics-natural science curriculum. The battery comprised several subtests linked to various perceptual and cognitive capabilities. We measured musical auditory abilities and sensorimotor entrainment, language-related abilities (phonological awareness, rapid automatized naming, reading), executive functions (verbal fluency, counting span, non-verbal Stroop task), and intellectual abilities (Block Design, Digit Span, Vocabulary) in 59 children. Results showed that early reading skills were significantly related to tempo perception in music, sensorimotor synchronization, and additional tasks requiring executive functions. We found that both phonological awareness and RAN ability correlated with entrainment skills. Our data indicate that language-related skills are initially associated with temporal processing and sensorimotor adaptation to repeatedly appearing musical stimuli. Moreover, there was no difference between the two school classes in achievement, suggesting that this sample forms a good basis to evaluate the developmental implications of the applied movement-based music training in elementary school education.