



From Neuroscience to the Classroom

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Neuroscientific Evidence of the Cognitive Benefits of Musical Hobbies for Learning

Abstract:

Recent research has revealed several changes in brains of musicians both in terms of structure of the gray and white matter as well as altered functionality in a number of brain areas. Similar structural and functional changes have also been confirmed in children and adults after starting a musical hobby. Such changes have been shown to lead to advanced performance in a range of tasks, including linguistic, memory- and attention-related, psycho-motor and general intelligence tasks - findings originally observed in group comparison studies but later largely confirmed also in intervention studies. In the talk it is proposed that these neural changes induced by musical hobbies provide a cognitive benefit for learning that should be available for all learners and could be an important learning enhancement strategy for teaching. Specific applications of music in education are outlined, ranging from experimental intervention studies in infants to supporting toddlers' native and second-language learning, attentive skills in school-aged children, reading and writing in dyslexic individuals, and general cognitive capacities in learners. Finally, the specificity of music for such benefits is discussed in comparison to other hobbies and activities.

About:

Minna Huotilainen is a neuroscientist and a docent of cognitive science at University of Helsinki and is currently Erik Allardt Fellow at Swedish Collegium for Advanced Study in Uppsala. Her work has demonstrated capabilities of the auditory system for perceptive, memory and attentive functions in infants, fetuses, children and adults. Her main findings include fetal memory traces for speech and music, neurocognitive benefits of musical hobbies, alterations of cognitive performance in stress and burn-out, and methodological advancements of neuroscientific measurements using natural sounds in real-life working and learning environments.