

Effects on Cortical Thickness due to Musical Training in Elementary School Children: The Importance of Manual Structural Analysis

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Abstract : Studying musicians has become a prominent approach in macrostructural neuroscience research aimed at exploring the influence of environmental factors on brain development due to the significant impact of musical training on the brain. Although longitudinal studies can establish a direct causal relationship between musical training and brain development, only a limited number of studies have been conducted for a long enough duration. We recruited children for the experimental music group to participate in an after-school music program which was compared to the control group that had no such after-school program or enrichment activities. We ultimately calculated cortical thickness, a distinct measure of development. When a task such as playing an instrument occurs frequently, the associated neural processes become quicker and more refined over time, causing only the necessary pathways to remain; this, therefore, results in cortical thinning. The Brain and Music Lab has identified the anterior and posterior superior temporal gyrus, Heschl's gyrus, and the inferior regions to be involved with musicianship. The past study only found that the posterior superior temporal gyrus experienced a larger thinning in the music group compared to the control; however, we expect our ongoing study to produce similar but more intense results, including thinning in the other regions associated with musicianship. We believe the limited results of the previous study are due to its short duration which is why this ongoing and more lengthy longitudinal study is a significant and indispensable contribution in helping us discover the important developmental aspects of musical training.

Keywords : cortical thickness, music, neuroimaging, child development

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