

Musical training facilitates brain plasticity: Short-term training effects on sensorimotor integration

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Efficient sensorimotor integration is essential for music performance. Previous research has indicated that auditory-motor associations form not only as a result of long-term training but after a very brief period of training. After short-term training, it has been demonstrated that premotor areas are recruited during passive listening of trained music, suggesting that these mappings can rapidly become automatic. It has been argued that these mappings rely on activity in mirror neuron systems (involved generally in imitating and learning actions). Action-observation studies in this field have associated changes in EEG mu-rhythm activity with the mirror neuron system. We utilized this technique in our action-listening study in order to detect involuntary motor co-activation during passive listening to melodies and rhythms. We investigate whether motor co-activation during passive listening occurs specifically for newly acquired sound-action mappings after training. Subjects participated in a short-term training scheme in which they were trained to accurately play back randomly generated basic piano melodies. Preliminary results show changes in the mu-rhythm activity in post-training EEG recordings. These initial findings support the hypothesis that sensorimotor experience is important for the mirror neuron system. This study demonstrates that musical training research can make a valuable contribution to brain plasticity research.

Keywords: sensorimotor training; brain plasticity; neuroimaging; EEG; audio-motor

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