

Investigation of brain activation while listening to and playing music using fNIRS

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This paper describes our preliminary investigation on musical brain activities using fNIRS. We conducted two sets of experiments on musical activities: 1) a comparison of activities in subjects hearing music but not paying attention to it, listening to music actively, and playing music using an interactive performance interface called iFP, and 2) an investigation of the effect of sound and vibration, and effect of a steering eurhythmics, featuring a Japanese drum set. We observed decreases in brain activation in the dorsal prefrontal cortex (DPFC) when the subjects listened to their favorite music and when they played music with the use of an interface which they had been accustomed. The decrease is regarded as indicating an immersive or observed sensation. In the second experiment, we observed more brain activation in the DPFC and the temporal cortex while the subjects were beating a genuine Japanese drum compared with while they were beating a toy drum pad. We also obtained data that the idea that interactive play activates the DPFC.