

Poster presentation

Voluntary modification of musical performance by neurofeedback training

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Background

Neurofeedback displayed significant improvements in the overall quality of the musical performance. Few investigations showed that predictors of good psychomotor performance are low integrated EMG of muscle non-participating in execution and an increased EEG alpha activity (Bazanova et al, 2003; Pantev et al, 1998; Petsche & Etlinger, 1998).

The main objectives of the present investigation was to study the impact of simultaneous individual alpha-EEG stimulating and EMG decreasing biofeedback (Alpha-EEG/EMG BFB) on electrophysiological indices in musicians by comparing responses of musicians to usual practice and practice combined with biofeedback training.

Materials and methods

The aim of the neurofeedback training of 51 musical students was "to attain a state at which achieving high quality musical performance would be complimented with a feeling of easiness and comfort". Firstly, they had their usual practice (30 minutes), followed by rest and another 30-minutes lasting practice combined with Alpha-EEG/EMG BFB. Efficiency of Alpha EEG/EMG BFB session was calculated as the ratio between the sum-duration of the successful periods during the Alpha EEG/EMG BFB session and the whole length of the session.

Results

Usual practice caused decrease while practice combined with biofeedback increase in individual alpha-activity indices in the alpha-2 band. In the same time usual prac-

tice increased muscle tension, while practice with biofeedback decreased EMG. The score of self-estimated "quality of sound" was higher after practice combined with alpha-EEG/EMG-BFB than after usual practice ($p=0.021$). Efficiency of the biofeedback depended on the power in alpha-2 band, individual alpha peak frequency, individual alpha band width and individual amount of alpha suppression in response to open eyes.

Conclusions

Enhanced somatosensory and auditory feedback during performance on the instrument facilitates the online modification of musical execution skill

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