

TYPE OF MUSICAL TRAINING SELECTIVELY INFLUENCES PERCEPTUAL PROCESSING

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Background

Musical training influences both brain structure and function. Musicians who began their training before age 6 or 7 have a larger left planum temporale or corpus callosum. String players have a larger cortical representation of the left hand. Piano, singing, or rhythm instruction before age 7 improves performance on spatial-temporal tasks.

Aims

To determine how the type of musical training influences perceptual processing in adults.

Method

45 participants were recruited in three groups of 15: non-musician controls (C), percussionists (P), and string players (S). On average, musicians had played for more than 30 years and had more than 16 years of formal instruction. Four discrimination tasks were presented in random order: auditory duration (AD); auditory frequency (AF); visual duration (VD); visual frequency (VF). Auditory stimuli were 44.1 KHz 16-bit sine waves. Visual stimuli were vertical gratings of sinusoidally-varying brightness convolved with a

Gaussian filter. On each trial, a standard stimulus was presented followed by a comparison stimulus differing in duration or frequency. An adaptive staircase procedure made the discrimination harder after correct trials and easier after incorrect trials. Each task ended when 12 errors were made. The median of the last 11 errors was selected to represent each individual's discrimination threshold. Planned comparisons were performed between groups using *t*-tests.

Results

AD: P better than C. AF: S better than C. VD and VF: no differences.

Conclusions

The type of musical instruction selectively influences perceptual discrimination processes. Planned neuroimaging studies will determine the functional basis of these differential abilities.