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Project Summaries

BrainsCAN

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The effect of musical training on speech and sound perception

BrainsCAN, Western University

Ingrid Johnsrude

Vanessa Irsik

Stephen Van Hedger

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The effect of musical training on speech and sound perception

Background

Musicians develop instrument or voice expertise through years of specialized training. They excel at understanding pitch and timbre, and they exhibit superior motor skills, such as enhanced hand dexterity, beat synchronization and vocal tract control.

These skills and expertise may result from experience-dependent changes in the brain regions that support auditory and motor functions. Relative to non-musicians, musicians show enhanced grey matter in the auditory cortex (the brain region that processes information we hear), the motor cortex (the brain region responsible for planning, control and execution of our voluntary movements) and cerebellum (the brain region that receives information from our sensory systems and coordinates our movements).

Intriguingly, recent research is suggesting that musical training might provide benefits outside of music, too. Musicians have been reported to be better at understanding speech in noisy environments and older musicians may have increased 'protection' against some of the negative impacts of age-related hearing loss. These improved abilities may be related to experience-dependent changes at the earliest stages of auditory processing, the cochlea and brainstem, two areas that are normally considered to be 'hardwired' after childhood.

The Problem

If musical training does lead to general benefits to hearing, this would be very important for science and for social and educational policy. Currently, evidence comes from single studies involving small numbers of participants and the findings haven't been repeated. More work is needed to explore this further, such as a systematic, large-scale study that is able to exclude other potential reasons for these benefits (such as socioeconomic status, for example).

Funding Program

BrainsCAN Accelerator Grant:
Stimulus

Awarded: \$59,599

Additional BrainsCAN Support

Human Cognition & Sensorimotor
Core
Imaging Core

Western Faculty, Group or Institution

Department of Psychology,
Faculty of Social Science

Keywords

Aging, hearing & auditory
perception, music & beat
perception

Related

None

The Project

We are going to carry out such a study, in conjunction with research labs at five other institutions. With six universities involved, we will be able to recruit a sufficiently large number of people in the study and decrease the likelihood of any regional bias influencing the outcomes. We will be trying to validate the following claims:

- * that musicians have an improved ability to understand speech in noisy environments,
- * that the responses of a musician's brainstem to speech sounds is enhanced, and
- * that older musicians have reduced symptoms from age-related hearing loss.

Western Researchers

Ingrid Johnsrude

Vanessa Irsik

Stephen Van Hedger

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