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OMMABA: the open multimodal music and auditory brain archive

BrainsCAN , Western University

Jessica Grahn
Western University

Jorn Diedrichsen
Western University

Joe Gati
Western University

Molly Henry
Western University

See next page for additional authors

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Authors and Researchers

BrainsCAN , Western University; Jessica Grahn; Jorn Diedrichsen; Joe Gati; Molly Henry; Robert Zatorre; Jean-Baptiste Poline; Bratislav Misic; Estrid Jakobsen; Mor Regev; Marcel Farrés Franch; Virginia Penhune; and Emily Coffey



OMMABA: the open multimodal music and auditory brain archive

Background

Research communities can benefit greatly from constructing and sharing open databases of functional, structural and behavioural brain mapping data from large samples of healthy participants. The revolutionary Human Connectome Project (HCP) is an example of this approach, developed between 2009 and 2014, and there have been others since that were focused on specific disorders such as Alzheimer's disease, other types of data acquisition and other stages of life. Such a database offers the power of multimodal, high-quality big data to address questions of neural connectivity, anatomy, cognition and plasticity.

The Problem

There are many primary hearing disorders and auditory symptoms are prominent in many other disorders. While the HCP has become invaluable for research in the areas it addresses, it is lacking in measures of auditory cognition. Among the dozens of behavioural tests that are administered, only one could be considered a test of auditory function. Similarly, among the active fMRI tasks, there is only a single one that involves auditory stimulation and it's more related to semantic comprehension than auditory processing.

An auditory cognition database needs to characterize the auditory responses to stimuli, measure differences in auditory ability and provide a variety of stimuli. There is currently nothing like this available.

The Project

We will create a specific neuroimaging database focused on the auditory domain. It will allow researchers to ask questions about the neural circuitry underlying auditory behaviour in the healthy brain and to understand the sources of individual variability. We will include detailed information about experiential factors, such as musicianship and bilingualism that are not documented in any existing databases, so that it will be possible to investigate plasticity-related effects. It will also provide baseline data for clinical studies.

The Collaboration

This project is addressing the brain plasticity and neuro-informatics focus of HBHL (McGill) with the neural basis of learning/thinking/moving/communicating focus of BrainsCAN (Western). It brings together the expertise of Dr. Grahm's lab in rhythm and sensory-motor processing and EEG with that of Dr. Zatorre's group in music and speech perception, MRI and the interaction between music and the reward system.

Western Researchers

Jessica Grahm
Jorn Diedrichsen
Joe Gati
Molly Henry

McGill Researchers

Robert Zatorre
Jean-Baptiste Poline
Bratislav Misic
Estrid Jakobsen
Mor Regev
Marcel Farrés Franch

Concordia Researchers

Virginia Penhune
Emily Coffey

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Western Faculty, Group or Institution

Department of Psychology, Faculty of Social Sciences; Centre for Functional & Metabolic Mapping, Robarts Research Institute

McGill Faculty, Group or Institution

Montreal Neurological Institute, Faculty of Medicine; Auditory Cognitive Neuroscience Lab

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[Hearing & auditory perception](#), [fMRI](#), [MRI](#)

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