

Center for Music in the Brain Seminar, September 30th, 2015, 10-12 am

4th-floor meeting room, building 10G, Aarhus University Hospital, Nørrebrogade, 8000 Aarhus C
Prof. Petri Toiviainen, Dr. Vinoo Alluri & Phd-student Iballa Burunat, University of Jyväskylä, Finland:

“Studying the Musical Brain with natural-stimulus fMRI”

Abstract: The past two decades have witnessed a surge of neuroimaging studies that have attempted to identify brain structures involved in the perception of music-related perceptual features, such as pitch, sensory dissonance, rhythm, timbre, and key, typically in controlled conditions wherein the feature of interest has been presented in isolation and manipulated artificially. Such studies have inspected phenomena relatively distinct from the actual music listening situation where listeners continuously and subconsciously extract several musical features that are changing and integrate them into coherent percepts.

We present a novel paradigm that allows prediction of the temporal evolution of brain activations to musical features at a voxel-level. Subsequently, we discuss our previous studies performed using this paradigm involving encoding and decoding approaches. In this setting, participants are scanned using fMRI as they listen to natural musical stimuli uninterruptedly and without distraction by any experimental task. Subsequent acoustic feature extraction procedures from the field of Music Information Retrieval (MIR) are employed to characterize the temporal evolutions of musical features, which are then used to correlate with the fMRI time-series to determine where these features are processed. In order to assess the replicability and generalizability of the results and the robustness of the encoding models, we have extended this approach to other participant pools and music belonging to various genres with and without lyrics.

We also discuss our recent work on functional connectivity during music listening, with a special emphasis on the effect of musical training thereon. The studies include whole-brain connectivity analysis, hemispheric symmetry, and hippocampo-cerebellar connectivity.

Finally, we will present preliminary results of an ongoing study that uses high resolution scanning (7 Tesla) to investigate emotional prosody processing in the primary auditory pathway.



For more information about the seminar, please contact
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