

# MUSICAL LEARNING ACROSS THE LIFESPAN/ MUSIC, COGNITION & THE BRAIN INITIATIVE

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### Jessica Grahn

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### Ingrid Johnsrude

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## Music, Cognition, and the Brain IDI: Year 2

2018–2019 was the second year for Music, Cognition, and the Brain, an Interdisciplinary Development Initiative (IDI) at Western University. We hosted several events throughout the year, including a series of seminar talks by guest speakers (see p. 2) and a two-day retreat. The IDI awarded two pilot study grants for projects led by postdocs in the Don Wright Faculty of Music and the Brain and Mind Institute. We also awarded a Research Visit Grant, which will allow a UWO grad student to spend two weeks at the University of Edinburgh's Institute for Music in Human and Social Development. In terms of undergraduate education, we have mapped out a dual-degree pathway to guide undergraduates who wish to concurrently pursue a B.Mus. and a B.A. (Honors Psychology).



Jessica Grahn

The initiative will continue in 2019–2020, with more events and funding opportunities. This will be the third and final year for the IDI. Dr. Kevin Watson will serve as the IDI's Director, while Dr. Jonathan De Souza is away on sabbatical.

## Dr. Ingrid Johnsrude Appointed BMI Director

Dr. Ingrid Johnsrude—a core faculty member for the Music, Cognition, and the Brain Initiative—was recently appointed as Director of Western's Brain and Mind Institute. For more information, please see <https://news.westernu.ca/2019/04/bmi-director-named/>

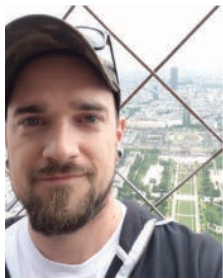
## Dr. Jessica Grahn Featured at SOLUNA Festival in Dallas

Dr. Jessica Grahn (left) was one of the invited speakers at the Dallas Symphony SOLUNA Festival for the Music and the Brain Symposium, where she discussed how music makes us move, the effects of music on cognitive abilities and brain structure and the benefits of music for patients with neurological disorders. More information is available online at <https://www.mydso.com/soluna/events/soluna-19-music-brain>.

## Research Spotlight: New Dissertations

*Many graduate students at Western are actively engaged in research about music and psychology. Here are two summaries of current projects.*

Neural entrainment is important for perception, especially when stimuli are predictable, like in musical rhythms. Although recent EEG studies suggest that greater power at



Aaron Gibbings

relevant frequencies in the EEG signal may reflect neural entrainment, there is still a debate about how best to account for the stimulus-driven response in the neural signal. This thesis describes a series of experiments designed to characterize, isolate, and remove the stimulus-driven response to better understand how neural entrainment is related to perception of rhythmic auditory stimuli.

*Aaron Gibbings is a PhD student in the Behavioural and Cognitive Neurosciences program in the Department of Psychology.*

My dissertation is a set of clinically oriented studies exploring music-based rhythmic auditory stimulation (RAS) as a technique for gait rehabilitation in Parkinson's disease. The projects examine the properties of mu-



Emily Ready

nic in RAS that drive change in gait patterns, such as groove and familiarity, and how they interact with individual beat perception abilities and task demands while synchronizing.

*Emily Read is an occupational therapist and a PhD candidate in the Health and Rehabilitation Sciences program at Western as part of the Combined MScOT/PhD program.*

## Recent Publication: "The Effect of Mental Practice on Melodic Jazz Improvisation"

*An article by Dr. Kevin Watson, co-authored with Peter Miksza and Iantheia Calhoun, was recently published in the journal Psychomusicology: Music, Mind & Brain. For more details, see <http://doi.org/10.1037/pmu0000206>.*

The purpose of this study was to examine the effects of mental practice, physical practice, and mental and physical practice combined on the ability to create melodic jazz solos within chord progressions, possessing relatively simple or complex harmonic characteristics. We also explored whether improvisation achievement varied as a function of general mental imagery ability. Fifty-six jazz studies majors from two large North American universities were randomly assigned to one of three experimental conditions (physical practice, mental practice, or physical and mental practice combined) and tasked with preparing melodic improvised solos over two sets of chord changes that varied in complexity (i.e., simple vs. complex).

The participants' solos were rated for melodic jazz improvisation achievement by two expert-level professional jazz artists. ... We did not find significant differences in melodic improvisation achievement as a function of practice condition nor did we find that chord progression complexity moderated the effect of practice condition. However, significant differences were detected as a function of chord progression complexity. Theoretical avenues for designing future experiments are discussed in-depth with respect to the typical practice approaches jazz musicians use when developing improvised solos, issues of closed- versus open-class motor skills, cognitive load, and expert memory storage and retrieval.

## Music, Cognition & the Brain Seminar Series, 2018–2019

- Elizabeth Hellmuth Margulis (University of Arkansas), "What is Musical Listening?"
- Nori Jacoby (Columbia University), "The World in 30 Beats: A Global Survey of Rhythm Representations"
- Glenn Schellenberg (University of Toronto), "Music Training and Nonmusical Abilities: Associations or Causation?"
- Zachary Wallmark (Southern Methodist University), "Sound Affects: Three Theories of Timbre"
- Leigh van Handel (Michigan State University), "Melodic Influences on Tempo Determination"
- Maria Witek (University of Birmingham), "Musical Groove: Pleasure, Movement, and Embodied Neuroscience"