

# MUSICAL LEARNING ACROSS THE LIFESPAN

## CORE FACULTY

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### Jessica Grahn

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### Ingrid Johnsrude

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### Ewan Macpherson

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## ASSOCIATED FACULTY

### Daniel Ansari

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### Carol Beynon

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### Mark Daley

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### Victoria Meredith

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### Laurel Trainor

Psychology,  
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### Ruth Wright

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### Betty Anne Younker

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## New Interdisciplinary Development Initiative

The MLAL Core Faculty Team has been awarded an Interdisciplinary Development Initiative (IDI) grant from Western. This three-year grant, hosted in the Don Wright Faculty of Music, will support:

- A postdoctoral fellowship in the Faculty of Music, and funds for interdisciplinary pilot studies
- A new graduate collaborative program, including a new seminar series, and support for graduate-student exchanges with the University of Edinburgh's Institute for Music in Human and Social Development (IMHSD)
- Defined pathways for dual BMus/BA degree in music and psychology

More details about the IDI will be forthcoming in Fall 2017!

## Research: Tuning in to the Rhythms in Music and Language

*Christina vanden Bosch der Nederlanden is a Postdoctoral Fellow at Western's Brain and Mind Institute. She received a PhD in Experimental Psychology from the University of Nevada,*



C. vanden Bosch der Nederlanden

*Las Vegas in 2016. She describes some of her current research:*

One of the exciting things about studying music perception and cognition is discovering the similarities between music and language. Music and language are both important systems of communication that unfold in time and, as listeners, we are required to chunk that incoming speech or music stream into small parts to understand who is doing what to whom or where to clap our hands. Yet, music and language are not the same. Speech and song have different acoustic characteristics and, when there are similarities, we have to pay attention to the same features differently. For instance, when we sing, notes unfold in a regular pattern that, in most Western music, can be grouped into larger recurring units of 2 or 3. This regularity gives rise to a beat or underlying pulse in the music and allows others to join in by singing or clapping synchronously with the music. Rhythms in speech arise as a result of the onsets of words and syllables unfolding in time and they are much less regular than music, which would make it hard to clap along to speech rhythms or even larger groupings of words and syllables. Tracking the

rhythms of speech is important for intelligibility and comprehension and children with dyslexia have trouble tracking these rhythms. It may be that sung speech, with more rhythmic regularity and pitch cues to highlight syllable rhythms, may allow children with dyslexia to track speech rhythms more closely. At Western's Brain and Mind Institute, I am working with Marc Joanisse and Jessica Grahn to dig deeper into how the rhythms of music and language are processed during development.

In the first part of examining this question, we had typically developing adults listen to sung and spoken versions of the same sentence while we recorded brain activity from their scalp using electroencephalography, or EEG.

We found that adults' neural activity significantly phase-locks, or synchronizes, to the syllable rate in spoken and in sung utterances, but there is no difference between the way adults track rhythms when they are sung compared to spoken. We are now moving on to study how children with and without dyslexia neurally track the rhythms of speech and song. Even though we did not find a difference between speech and song for adults, it may be that children with dyslexia will benefit from the rhythmic regularity of song and will track sung speech just as well as their peers. If we find that dyslexic children benefit from processing sung speech, then future studies may examine how rhythmic music training could be used alongside tradi-

tional clinical interventions for dyslexia.

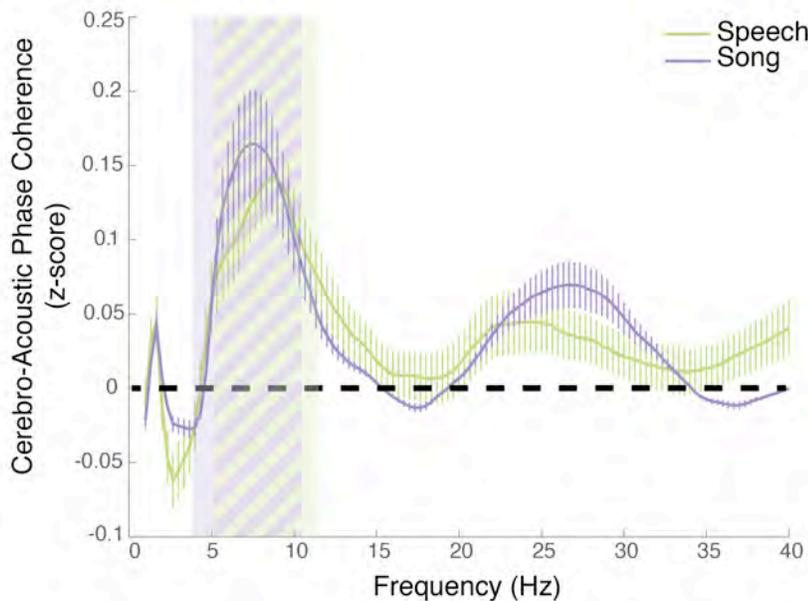
## Report: MLAL-IMHSD Graduate Exchange

Emma Moore is a PhD student at the Institute for Music in Human and Social Develop-



ment (IMHSD), Reid School of Music at the University of Edinburgh, where her research focuses on music and dyslexia. During Fall 2015, Emma spent one month visiting Western, as part of the MLAL initiative, to train in Jessica Grahn's Music Neuroscience Laboratory. Here she reports on this exchange:

My research into music and dyslexia stems from my interest in music and neuroscience. Visiting Western gave me the opportunity to be part of Jessica Grahn's lab team, which specializes in music and neuroscience. I was able to learn new brain imaging analysis techniques to explore functional brain connectivity that complement my previous structural imaging work, as well as learning about the music perception tests they use, which are highly relevant to my own research. I was also able to visit the Gait Lab, which was particularly interesting to me since my MSc by Research explored the potential of musical cues to support movement learning. By attending numerous talks from visiting speakers, and jour-



Cerebro-acoustic phase coherence gives an estimate of how well EEG data tracks the amplitude envelope of the spoken or sung utterance. Higher values indicate more consistent phase-locking. There was significant phase-locking to syllable-level frequencies (4-8Hz) for both speech (green) and song (purple) that was mostly overlapping.

nal club and lab meetings, I was able to meet and discuss my work with new people, as well as learn about other work going on in the field. All of this was a valuable learning opportunity for me.

During my visit I was also invited to give a guest lecture at the Don Wright Faculty of Music and to share my experience of moving from a completing a music degree into interdisciplinary research. My trip concluded with a giving a spoken presentation at the inaugural MLAL public symposium, which featured talks from a range of researchers and practitioners interested in musical learning, as well as music performances.

Outside of work I was able to experience Homecoming at Western, go to my first football game, enjoy pancakes and maple syrup, and visit some key tourist attractions including Niagara Falls and the CN Tower.

The MLAL initiative is an excellent opportunity for students with an interest in music and the brain, and I would definitely recommend that other students take the opportunity to participate in exchanges between Edinburgh and Western.

### Research Presentations by Music Grad Students

Several music graduate students who have been involved in the MLAL Initiative recently gave successful presentations at national and international conferences.

Elizabeth Kinghorn presented “Room Acoustics and the Singing Voice: The effects of environmental reverberation on vocal intensity and the perception of vocal effort in trained singers” at the Desert Skies Symposium on Music Education, which was held at Arizona State University in Tempe, Arizona. She will also be presenting “Musical Engagement and Emotion Regulation in Undergraduates: An exploration of influential factors” at the upcoming meeting of the Society for Music Perception and Cognition in San Diego, California.

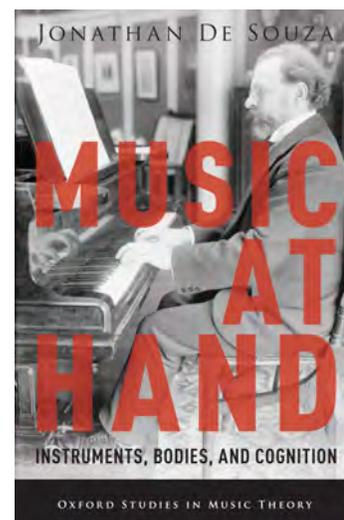
In May 2017, Clare Neil won the Peter Narvaez Student Paper Prize from the Canadian branch of the International Association for the Study of Popular Music for her paper “All I Know is All I Know: Canadian Heavy Metal Girlhood in the Music of Kittie.” The IASPM CA conference was held in conjunction with the Canadian Association of Music Libraries, Archives and Documentation Centres (CAML), the Canadian Society for Traditional Music (CSTM), and the Canadian University Music Society (Mus-Can).

Also in May, Kristen Wallentinsen was co-recipient of the Arthur J. Komar Award for outstanding student paper at the Music Theory Midwest conference in Iowa City, Iowa. Her paper was titled “Plainchant and Unicorns: What Fuzzy Set Theory Can Say about Musical Ontology.” Wallentinsen

has also received the Society for Music Theory’s inaugural SMT-40 Dissertation Fellowship. As of this autumn, she will be teaching at the School of Music at the University of North Colorado.

### Book: Music at Hand

A new book by MLAL Coordinator Jonathan De Souza has been published by Oxford University Press. *Music at Hand: Instruments, Bodies, and Cognition* asks how body-instrument interaction affects musical organization and musicians’ experience. The book combines music theory, cognitive psychology, and philosophy, and it examines diverse repertoire, from Beethoven to blues harmonica, from Bach to electronic music. An e-book version is available via the UWO Library and Oxford Scholarship Online.



### Contact MLAL

For more information, please visit [music.uwo.ca/research/research-groups/mlal](http://music.uwo.ca/research/research-groups/mlal) or email Jonathan De Souza at [jdsou22@uwo.ca](mailto:jdsou22@uwo.ca).