

# Language Science: The Next Generation

November 14, 2019 (8 am – 2:30 pm)

Montreal Convention Center, Palais des congrès, Room: 521 B/C, Montreal, QC, Canada

- 8:00**                    **Doors open for registration, coffee etc.**
- 8:30 – 8:35**            **Opening remarks (Debra Titone, McGill)**
- 8:35 – 9:55**            **Speaker session 1 (Chairs: Annie Gilbert & Jason Gullifer, McGill)**
- 8:35                    Veronica Whitford (University of New Brunswick)
- 8:55                    Belem López (The University of Texas at Austin)
- 9:15                    Laura Batterink (Western University)
- 9:35                    Emily Coffey (Concordia University)
- 9:55 – 10:10**        **Break**
- 10:10 – 11:30**       **Speaker session 2 (Chair: Angela Grant & Shanna Kousaie, McGill)**
- 10:10                  Brendan Johns (University at Buffalo)
- 10:30                  Nida Latif (McGill University)
- 10:50                  David Sidhu (University College London)
- 11:10                  Janine Metallic (McGill University)
- 11:30 – 12:30**       **Lunch (provided)**
- 12:30 – 1:50**        **Speaker session 3 (Chair: Natalie Philips, Concordia)**
- 12:30                  Annie Gilbert and Jason Gullifer (McGill University)
- 12:50                  Angela Grant (Missouri Western State University) and Shanna Kousaie (McGill University)
- 1:10                    Gerrit Jan Kootstra (Radboud University Nijmegen, Windesheim University of Applied Sciences) and Gregory Poarch (University of Münster)
- 1:30                    Annie Beatty Martinez (The Pennsylvania State University) and Christian Navarro-Torres (University of California, Irvine)
- 1:50 – 2:00**            **Break**
- 2:00 – 2:20**            **Discussant, Professor Judith Kroll (University of California, Irvine; Introduced by Denise Klein & Shari Baum)**
- 2:20 – 2:30**            **Closing Remarks**

Bilingual Experience Impacts Eye Movement Measures of Naturalistic Reading:  
A Journey Through Childhood, Young Adulthood, and Older Adulthood

Veronica Whitford  
University of New Brunswick

Abstract:

Reading is crucial for full participation in modern-day society. Most research, however, has focused on reading processes in monolinguals, despite being outnumbered by bilinguals across the world. Given that bilinguals have qualitatively and quantitatively different language experiences, an important question for the study of reading (and language more generally) is how bilingual experience impacts key reading processes that are essential to day-to-day life. Dr. Whitford will present a series of eye-tracking studies that have addressed this question in bilinguals across the lifespan, from early childhood to late adulthood.

Biography:

Dr. Whitford is a Canada Research Chair – Tier II and Assistant Professor of Psychology at the University of New Brunswick. She obtained her Ph.D. in Experimental Psychology from McGill University (supervised by Dr. Debra Titone). She then completed two post-doctoral fellowships in Developmental Cognitive Neuroscience: the first at the University of Western Ontario (supervised by Dr. Marc Joanisse) and the second at the Massachusetts Institute of Technology and Harvard University (co-supervised by Drs. John Gabrieli and Gigi Luk). Her research program focuses on the behavioural and neural correlates of reading in children and adults with diverse language and cognitive backgrounds.



# Including a Language Brokering Perspective: An Examination of Informal Translation Practices Among Bilinguals

Belem López  
The University of Texas at Austin

## Abstract:

Language brokering is an informal translation practice found in language contact and immigrant contexts, whereby bilingual children and adolescents serve as translators (i.e., language brokers) for family members. While prior brokering research has yielded mixed findings on its outcomes on mental health and academic achievement, a lesser-studied area has been the examination of the long-term cognitive and linguistic effects. In this talk, I propose the incorporation of language brokering experiences as an important individual differences variable within bilingualism studies. This talk provides an overview of recent research on the impact of language brokering experience on cognitive and linguistic processing, and identifies potential areas of future investigation for bilingualism researchers. The purpose is to highlight the importance of integrating language brokering perspectives into our understanding of the effects of bilingual experiences on language processing and cognition.

## Biography:

Dr. Belem G. López is an assistant professor in the Department of Mexican American and Latina/o Studies at The University of Texas at Austin, where she directs the LLAMA Psycholinguistic and Sociolinguistic Laboratory. She also holds courtesy appointments in the Departments of Spanish and Portuguese and Psychology and is a faculty affiliate in the Center of Mexican American Studies and the Latino Research Institute. Her research program broadly focuses on how knowledge of two languages can shape cognition in terms of creativity, problem-solving, decision-making, and language access in Spanish-English bilingual Latinx populations and examines how early linguistic and cultural experiences (e.g., informal translation–language brokering) can affect cognitive, linguistic, and health outcomes.



## Insights into statistical learning from EEG-based neural entrainment

Laura Batterink  
Western University

### Abstract:

Statistical learning is the ability to detect structure in the environment and is thought to play a key role in many aspects of language acquisition. We have shown that an EEG-based measure of *neural entrainment* can track statistical learning online: neural entrainment to words in an artificial language increases as a function of exposure and predicts individual performance on later learning tests. Using this approach, we have also found evidence that statistical learning (1) can occur outside of focused attention, (2) can occur remarkably rapidly, and (3) relies on at least partially overlapping mechanisms in pre-lingual infants and adults. These findings highlight the powerful and ubiquitous nature of statistical learning.

### Biography:

I am an Assistant Professor at Western University in the Department of Psychology and the Brain and Mind Institute. My research investigates neural mechanisms underlying language acquisition. A recent focus of my research is on understanding how the brain picks up on patterns and regularities in language. The underlying hypothesis is that learning these patterns is a form of implicit learning—occurring incidentally, without intention to learn, and producing knowledge that is inaccessible to awareness. I am also testing the related idea that learning these regularities is influenced and sometimes enhanced by unconscious processing that occurs during sleep.



## Tuning frequency encoding in the auditory system

Emily Coffey  
Concordia University

### Abstract:

Listeners can use their syntactic and semantic knowledge to predict input and thereby 'fill-in' degraded acoustic information, but language perception also relies on the quality of incoming information and the degree to which important aspects of sound are encoded, preserved, and enhanced within the auditory system. The frequency-following response (FFR) is a non-invasive means of measuring the brain's representation of sound, and has particular value in quantifying pitch representation. We present data concerning the FFR's relationship to perceiving sound in difficult listening conditions and individual variability, which in part is related to experience including musical training and language (multilingualism, tonal languages), and evidence for neuroplasticity in the fidelity of pitch encoding.

### Biography:

I am Assistant Professor in the Department of Psychology at Concordia University, where my lab focuses on neuroplasticity associated with complex tasks, using musicianship (and its interaction with language) as a model. We use a variety of neuroimaging tools (i.e. MEG, EEG, fMRI, DWI, VBM) to study the neural bases of auditory processing, hearing-in-noise, and musician advantages, and their relation to training. We are also combining these areas with new techniques that can causally influence sleep-dependent memory consolidation, such as closed-loop auditory stimulation. Ultimately, our goals are to understand how training and sleep interventions can maintain auditory and language function, and improve learning and quality of life throughout the lifespan.



# The Importance of Conceptual Clarity in Machine Learning Approaches to Lexical Semantics

Brendan T. Johns  
University at Buffalo

## Abstract:

Neural embedding models of lexical semantics use a neural network to learn the meaning of words from statistical redundancies contained in text. These models predict words that should surround a target word in a given context. An error signal is used to update each word's representation. It will be shown that the success of these models is not due to its use of a prediction mechanism or connectionist architecture. This work demonstrates that as advanced machine learning algorithms are being adopted in the language sciences, it will become increasingly necessary to understand the reason why different techniques are successful.

## Biography:

Brendan T. Johns, Ph.D. is currently an Assistant Professor at the University at Buffalo in Communicative Disorders and Sciences, Computational Linguistics, and Cognitive Science. He obtained his Ph.D. from Indiana University in the Departments of Psychological and Brain Sciences and Cognitive Science. His research is based on machine learning and big data approaches to language and memory, and has won awards from the Canadian Society for Brain, Behavior, and Cognitive Science, the Cognitive Science Society, the Psychonomic Society, and the Society for Computers in Psychology.



# Conversational Prediction and Interactive Alignment in Conversation

Nida Latif  
McGill University

## Abstract:

On a daily basis, we engage in many interactions that seem to occur effortlessly. However, the cognitive challenges associated with conversation are complex suggesting a specialized mechanism is involved in reducing the cognitive load. In this talk, I will suggest two potential mechanisms responsible for our perceived conversational ease: conversational prediction and interactive alignment. In the first half of the talk, I will present findings indicating the perceptual conditions necessary for predicting upcoming conversational turn-exchanges. In the second half, I will demonstrate that interlocutors align their behavior at several levels of conversation from syntactic structure to conversational movement.

## Biography:

Nida Latif is a postdoctoral fellow in the School of Communication Sciences and Disorders at McGill University. She completed her doctoral work in Psychology at Queen's University in Kingston, Ontario, Canada. Her research focuses on uncovering the perceptual, cognitive and social mechanisms that are responsible for the human ability to engaging in conversations easily and effortlessly. Specifically, she is interested in understanding how such processes can influence everyday social success. Her most recent projects include understanding how familiarity with a conversational partner influences perceived quality of an interaction and investigating conversational movement in adults with Autism Spectrum Disorder



# Investigations of Sound Symbolism and Iconicity

David Sidhu  
University College London

## Abstract:

*Sound symbolism* refers to universal tendencies to associate certain language sounds with certain kinds of properties. The most well known example of this is the maluma/takete effect, and the tendency to associate sounds like /m/ with round shapes and those like /t/ with sharp shapes. Sound symbolism is of relevance to real language by allowing for *iconicity*: instances in which a word's sounds are non-arbitrarily associated with its meaning. This talk will cover explorations of the maluma/takete effect, as well as the effects of iconicity on language processing.

## Biography:

I grew up in Toronto and completed my undergraduate degree at York University. I moved to Calgary for my graduate studies with Dr. Penny Pexman as my supervisor. Having completed my PhD in the Fall I am preparing to move to London to complete a post doctoral fellowship with Dr. Gabriella Vigliocco at University College London.





# Indigenous language revitalization through the eyes of young adult Mi'gmaq language learners

Janine Metallic  
McGill University

## Abstract:

This presentation features a study which explored the experiences and perspectives of young adult Mi'gmaq language learners who were learning their Indigenous heritage language as a second language. Two aspects of the contextual environment for language learning are highlighted: the classroom setting itself and the pedagogical approach used to teach language. The findings, based on interview data and observational field notes, help to provide a better understanding of the language learning experiences of young adult Mi'gmaq. This study provides important insights into Indigenous language revitalization by highlighting the experiences of young adult Mi'gmaq language learners and the pedagogical practices used in the classroom setting.

## Biography:

Janine Elizabeth Metallic (Mi'gmaq from Listuguj) is an Assistant Professor (Indigenous Education) in McGill's Department of Integrated Studies in Education. Metallic is a Mi'gmaq language speaker and has an educational background in health, science, language, and education. In Fall 2018, she initiated a research group called RISE (Research and Indigenous Scholarship in Education). RISE serves as a means to support and train Indigenous graduate students at McGill while developing research projects related to community-based education and language research. Specifically, Metallic's research interests include Indigenous educational studies and language revitalization using Indigenous, qualitative, and arts-informed approaches, with a special focus on Indigenous communities in Quebec.



# Language dominance and entropy as predictors of fundamental frequency modulations in bilingual production

Annie C. Gilbert & Jason W. Gullifer  
McGill University

## Abstract:

Adapting one's prosody to an L2 can be difficult, and failure to do so may render speech hard to understand. We present evidence that the ability of French-English bilinguals (L1 French and L1 English) to produce word-level and phrase-level fundamental frequency (F0) modulations during L1 and L2 production depends on individual differences in both objective language proficiency (measured by verbal fluency performance) and diversity of language exposure (measured by language entropy). Speakers also produced different F0 patterns in English and French, suggesting that prosody production is both adaptive (modified by language experience) and selective (specific to each language).

## Biographies:

Dr. Annie C. Gilbert is a research associate at the School of Communication Sciences and Disorders at McGill University. Her research investigates the impact of individual differences in bilingual experience on speech production and segmentation in L1 and L2 using behavioural and electrophysiological paradigms. She earned her Ph.D. in phonetics at Université de Montréal and completed her postdoctoral work in psychology at McGill University, looking at bilingual speech planning.

Dr. Jason Gullifer is a postdoctoral researcher in Psychology at McGill University (supervised by Debra Titone and Denise Klein). He received his PhD in Psychology and Language Science from the Pennsylvania State University in 2015. He was awarded an NIH Postdoctoral Fellowship to come to McGill in 2015. Dr. Gullifer's research uses multiple methodologies (including behavior, eye-movements, and brain function) to investigate how the various facets of bilingual experience impact cognition.



## Multimodal brain imaging of bilingual speech perception in noise

Angela Grant & Shanna Kousaie  
McGill University

### Abstract:

Noisy environments are ubiquitous as is bilingualism, yet little research to date has examined how bilingual individuals process speech in suboptimal environments. The current study examined speech comprehension in quiet and in noise in the two languages of French/English bilinguals. Across imaging modalities (MRI and EEG), our data suggest that language experience is an important factor for comprehending speech in suboptimal listening conditions.

### Biographies:

Dr. Angela Grant received her Ph.D. in Psychology and Language Science from the Pennsylvania State University in 2017, where she investigated the relationship between individual differences in executive function and second language acquisition. In the following two years, she expanded her electrophysiological and imaging expertise studying bilingual speech comprehension as a postdoctoral fellow at Concordia University and the Centre for Brain, Language, and Music in Montreal. Currently, Dr. Grant is working on computational models of executive function tasks at Missouri Western State University.

Dr. Shanna Kousaie is currently a research associate in the Cognitive Neuroscience Unit at the Montreal Neurological Institute. She received her PhD from Concordia University in 2011, where her research examined the effects of bilingualism on cognition using electrophysiological measures. Following the completion of her PhD, Shanna was awarded a CIHR postdoctoral fellowship to pursue postdoctoral training at the Bruyère Research Institute in Ottawa, where she extended her research to patients with cognitive impairment, and at the Montreal Neurological Institute, where she expanded her methodological expertise. Shanna's current research uses multimodal brain imaging to examine the influence of language experience on brain structure and function.



## Cross language activation: Exploring structural priming in bilingual children

Gerrit Jan Kootstra<sup>1,2</sup> & Gregory Poarch<sup>3</sup>

Radboud University Nijmegen<sup>1</sup>, Windesheim University of Applied Sciences<sup>2</sup> & University of Münster<sup>3</sup>

### Abstract:

Language users continuously adapt their linguistic preferences to the environment. One mechanism driving this is structural priming, the facilitated processing of recently processed structures. In bilinguals, structural priming occurs both within and across languages, and appears to drive typical bilingual phenomena like cross-linguistic influence and code-switching. In this talk, we present research elucidating the role of structural priming in bilingual children, showing (1) how bilingual children with different language backgrounds process ambiguous sentences, and (2) how their processing preferences are modulated by within- and cross-language structural priming. These results inform and extend theories on priming, implicit learning, and cross-language activation.

### Biographies:

Gerrit Jan Kootstra works as a postdoctoral researcher at Radboud University Nijmegen (the Netherlands), and as a researcher and lecturer at Windesheim University of Applied Sciences (Zwolle, the Netherlands). He focuses on the psycholinguistics of bi-multilingualism, specializing on the study of code-switching, structural priming and interactive alignment in bilingual language production and comprehension. At Radboud University, he is currently investigating these themes in bilingual children. At Windesheim University, he is mainly involved with bi-multilingualism in educational settings, translating insights from academic research to classroom practices.

Greg Poarch is assistant professor of English Linguistics at the University of Münster (Germany). He received an MA in sports science, English linguistics, and economics at the TU Darmstadt (Germany), and a PhD in psycholinguistics from Radboud University Nijmegen (the Netherlands). His research (and teaching) focus is also on the psycholinguistics of bi-multilingualism, with a particular interest in cross-linguistic lexical and syntactic interaction during language processing and the effects of multiple language usage on executive function across the lifespan.



## Bilinguals' behavioral ecology changes the relation between language and cognition

Anne L. Beatty-Martínez<sup>1</sup> & Christian A. Navarro-Torres<sup>2</sup>  
The Pennsylvania State University<sup>1</sup> & University of California, Irvine<sup>2</sup>

### Abstract:

The present study asked what consequences interactional contexts hold for the relation between language production and cognitive processes in bilinguals. Three groups of highly-proficient Spanish-English bilinguals from different interactional contexts were compared on measures of lexical access and cognitive control. Results showed that lexical access in each language, and how it related to cognitive control ability, depended on whether bilinguals used their languages separately, interchangeably, or whether they were immersed in their second language. Findings show that bilingualism does not, in itself, identify a unique outcome, which has important implications for understanding the dynamic nature of language more broadly.

### Biographies:

Anne L. Beatty-Martínez received her Ph.D. in Spanish and Language Science at the Pennsylvania State University in 2019. Her research agenda involves the integration of linguistic, cognitive, and neuroscientific approaches to examine how bilingual experience modulates language processing and cognitive control ability. In her research, she combines corpus and experimental approaches, including specially adapted speech-elicitation paradigms, eye-tracking, and event-related potentials, to study the psycholinguistics of codeswitching and bilingual language control.

Christian A. Navarro-Torres is a Ph.D. student at the University of California, Irvine. He received an M.S. in Cognitive Psychology at the Pennsylvania State University in 2016. His research program involves understanding how proficient bilingualism shapes the relation between cognitive control and language processing. He uses a combination of behavioral, eye-tracking, and electrophysiological methods to examine real-time cognitive control recruitment as bilinguals speak or comprehend in one language.



Judith Kroll  
University of California, Irvine



Biography (taken from <https://www.psychonomic.org/page/2019keynote>)

Judith F. Kroll is Distinguished Professor of Language Science at the University of California, Irvine and the former director of the Center for Language Science at Pennsylvania State University. She held faculty positions at Swarthmore College, Rutgers University, Mount Holyoke College, Penn State University, and University of California, Riverside, before joining the faculty at University of California, Irvine in 2019. Her research uses the tools of cognitive neuroscience to examine the way that bilinguals juggle the presence of two languages in one mind and brain (<https://bilingualismmindbrain.com/>). Her work, supported by grants from NSF and NIH, shows that bilingualism provides a tool for revealing the interplay between language and cognition that is otherwise obscure in speakers of one language alone. She is a Fellow of the AAAS, the APA, the APS, the Psychonomic Society, and the Society of Experimental Psychologists. She was a recipient of a John Simon Guggenheim Memorial Foundation Fellowship and is currently the chair-elect of Section Z (Linguistics & Language Science) of the AAAS. She was one of the founding editors of the journal *Bilingualism: Language and Cognition* (Cambridge University Press), and one of the founding organizers of *Women in Cognitive Science*, a group developed to promote the advancement of women in the cognitive sciences and supported by NSF (<http://womenincogsci.org/>). With Penn State colleagues, she was the PI on a 2010 NSF PIRE (Partnerships for International Research and Education) grant to develop an international research network and program of training to enable language scientists at all levels to pursue research abroad on the science of bilingualism (<http://www.psu.edu/dept/cls/pire/>) and on a 2015 PIRE grant to translate the science of bilingualism to learning environments in the US and abroad. She deeply appreciates the support and collaboration of her students and former students and many colleagues in the US and abroad.

# Language Science: The Next Generation

November 14, 2019 (8 am – 2:30 pm)

Montreal Convention Center, Palais des congrès, Room: 521 B/C, Montreal, QC, Canada

## Organizing Committee:

Jason Gullifer, Department of Psychology, Centre for Research on Brain, Language and Music, McGill University

Inbal Itzhak, Centre for Research on Brain, Language and Music, McGill University

Heather Macdougall, Centre for Research on Brain, Language and Music, McGill University

Natalie Phillips, Department of Psychology, Centre for Research on Brain, Language and Music, Concordia University

Debra Titone, Department of Psychology, Centre for Research on Brain, Language and Music, McGill University (Chair)

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