BIOGRAPHICAL SKETCH

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NAME: Gordon, Reyna

eRA COMMONS USER NAME (credential, e.g., agency login): gordonr1

POSITION TITLE: Assistant Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
University of Southern California, Los Angeles, CA	B.Mus.	05/2001	Vocal Arts, Italian
University of Provence (Aix-Marseille-I), Marseille	MS	07/2004	Neuroscience
Florida Atlantic University, Complex Systems and Brain Sciences, Boca Raton, FL	PhD	08/2010	Complex Systems & Brain Sciences
Vanderbilt Kennedy Center, Nashville, TN	Postdoctoral Fellow	06/2015	Neurodevelopmental Disabilities

A. Personal Statement

I am a cognitive neuroscientist interested in the brain mechanisms underlying individual differences in music abilities and how they relate to language and social skills. To this end, I have pushed the boundaries of interdisciplinary knowledge of the role of rhythm in language by integrating approaches from Psychology, Neuroscience, Linguistics, Music Cognition, Communication Disorders, and Human Genetics. In my tenure-track Assistant Professor position at Vanderbilt University Medical Center, I direct the Music Cognition Lab where I mentor a vibrant group of trainees from Vanderbilt degree programs in Speech-Language Pathology, Audiology, Psychology, Neuroscience, Medicine, Engineering, and Medicine, Health & Society. We use a variety of brain and behavioral approaches to study the role of rhythm in the development of grammar skills, with a focus on atypical rhythm development in children with Specific Language Impairment (SLI). In the past year, internal funding awards have jumpstarted new collaborations with the Vanderbilt Genetics Institute and allowed us to pilot new music interventions for children with SLI.

I have over a decade of experience with cognitive neuroscience methods focusing on using electroencephalography (EEG) to investigate brain activity involved in auditory perception. My graduate work used singing as a model to compare music and language cognition, and my interest in translational research led me to a postdoctoral position at the Vanderbilt Kennedy Center, where I contributed to a number of multi-disciplinary studies that investigate social and language processing in individuals with neurodevelopmental genetic disorders, including Williams syndrome, Rett syndrome, and MECP2 duplication syndrome. I also helped found, and I now lead, the Program for Music, Mind & Society at Vanderbilt, a new cross-campus infrastructure for music research, showing my strong commitment to promoting and creating interdisciplinary research opportunities in my field and at my institution.

1. Magne C, Jordan DK, Gordon RL. Speech rhythm sensitivity and musical aptitude: ERPs and individual differences. Brain Lang. 2016 Feb;153-154:13-9. PubMed PMID: 26828758.
2. Gordon RL, Shivers CM, Wieland EA, Kotz SA, Yoder PJ, Devin McAuley J. Musical rhythm discrimination explains individual differences in grammar skills in children. Dev Sci. 2015 Jul;18(4):635-44. PubMed PMID: 25195623.
3. Gordon RL, Jacobs MS, Schuele CM, McAuley JD. Perspectives on the rhythm-grammar link and its implications for typical and atypical language development. Ann N Y Acad Sci. 2015 Mar;1337:16-25. PubMed PMID: 25773612; PubMed Central PMCID: PMC4794983.

4. Peters SU, Gordon RL, Key AP. Induced gamma oscillations differentiate familiar and novel voices in children with MECP2 duplication and Rett syndromes. J Child Neurol. 2015 Feb;30(2):145-52. PubMed PMID: 24776956; PubMed Central PMCID: PMC4406405.

B. Positions and Honors

Positions and Employment

2015 - Member, Vanderbilt Kennedy Center, Vanderbilt University Medical Center
2015 - Director Music Cognition Lab, Vanderbilt University Medical Center
2015 - 2106 Research Assistant Professor, Department of Otolaryngology, Vanderbilt University Medical Center
2016 - Faculty, The Graduate School, Vanderbilt University
2016 - Affiliate Training Faculty, Vanderbilt Brain Institute, Vanderbilt University School of Medicine
2016 - Assistant Professor, Department of Psychology, Vanderbilt University
2016 - Associate Director, Program for Music, Mind & Society at Vanderbilt
2016 - Assistant Professor, Department of Otolaryngology, Vanderbilt University Medical Center

Other Experience and Professional Memberships

2006 - Member, Entrainment Network
2006 - Conference Coordinator, Fourth Entrainment Network Meeting, hosted by the Music Dynamics Lab at Florida Atlantic University
2008 - Ad-hoc reviewer, PLoS ONE, Cortex, Psychology of Music, Developmental Neuropsychology, Psychological Research, Archives of Medical Research, Psychomusicology: Music, Mind, & Brain, Music Perception, Journal of Neurolinguistics, Speech Language and Hearing, Frontiers in Auditory Cognitive Neuroscience, Research in Intellectual Disabilities, Child Development, and Musicae Scientiae
2008 - 2012 Member, American Association of University Women
2009 - Member, Society for Music Perception and Cognition
2010 - 2015 Member, Society for the Neurobiology of Language
2010 - 2015 Consumer Member, State of Tennessee Council of Certified Profession Midwifery
2011 - 2012 Member, Association for Women in Science
2013 - 2014 Co-organizer, Vanderbilt University Music and Brain Seminar and Discussion Series
2013 - 2015 Member, Acoustical Society of America
2014 - Member, American Cochlear Implant Alliance
2014 - 2014 Program Committee, Vanderbilt Music & Mind: Melding Music and Mind in Music City
2014 - 2014 Participant, ASHA Lessons for Success
2014 - 2015 Planning Committee, Vanderbilt Kickoff to Society for Music Perception & Cognition Meeting
2015 - Facilitator, Music Research Design Clinics, The Program for Music, Mind & Society at Vanderbilt
2015 - Steering Committee, The Program for Music, Mind & Society at Vanderbilt
2015 - Implementation Team, The Program for Music, Mind & Society at Vanderbilt
2015 - 2015 Conference Co-Chair, Society for Music Perception & Cognition
2016 - Judge, Vanderbilt Bill Wilkerson Center Joint Poster Session
2016 - Ad-hoc Reviewer for Funding Agencies, National Science Foundation
2016 - Founding Member; Board of Directors, American Foundation for Science of Music
2016 - Review Editor, Frontiers in Auditory Cognitive Neuroscience
2016 - Facilitator, Science of Music Research Forums, The Program for Music, Mind & Society at Vanderbilt
2016 - 2016 Scientific Advisory Board, International Conference for Music Perception & Cognition
2016 - 2016 Symposium Chair, The Program for Music, Mind & Society at Vanderbilt Annual Symposium: The Science of Song
2016 - 2016 Program Committee, Pitch, Pace, & Rhythm: the Essentials to Conducting Music Treatment

	Research Workshop
2016 - 2018	At-large (elected) Board Member, Society for Music Perception & Cognition

Honors

2001	USC Renaissance Scholar, Excellence in Multidisciplinary Studies, University of Southern California
2004	Best Poster Award, Conference of Interdisciplinary Musicology
2006 - 2007	Pre-doctoral Trainee Fellowship, National Institute of Mental Health
2007 - 2008	Dissertation Fellowship, American Association of University Women
2007	Graduate Committee Travel Grant, Florida Atlantic University
2007	Travel Award, SEMPRE Bursary
2008 - 2009	Dr. Daniel B. and Aurel B. Newell Doctoral Fellowship, Florida Atlantic University
2012	Theodore Tjossem Travel Award , Gatlinburg Conference
2013	Honorable Mention, Poster, Vanderbilt Kennedy Center Science Day

C. Contribution to Science

1. Neural bases of linguistic and musical aspects of song perception:

   At the time that I began my Master's degree in 2003 only a handful of studies had examined the neural basis of song with imaging methods, and only a relatively small number of studies had compared language and music perception in general. Two publications resulted from the new paradigms we developed and tested during my Master's thesis work: in the ERP paper, we reported an exciting finding that the N400 effect, a well-established marker of semantic processing, was modulated by musical melody in song, suggesting that variations in musical features affect word processing in sung language (Gordon, Schön, Magne, Astésano, & Besson, 2010, PLoS One). Those ERP results, showing interactions between the linguistic and musical dimensions of song, coincided with results obtained in the fMRI study showing widespread, interactive involvement between brain areas recruited to perceive words and melodies, and thus argue against functional specificity of brain areas for language and musical processing (Schön, Gordon, Campagne, Magne, Astésano, Anton, & Besson, 2010, NeuroImage).

   a. Gordon R, Magne C, Large E. EEG Correlates of Song Prosody: A New Look at the Relationship between Linguistic and Musical Rhythm. Frontiers in Psychology. 2011; 2:-.
   b. Schön D, Gordon R, Campagne A, Magne C, Astésano C, Anton J, Besson M. Similar cerebral networks in language, music and song perception. NeuroImage. 2010 May; 51(1):450-461.
   c. Gordon R, Schön D, Magne C, Astésano C, Besson M. Words and Melody Are Intertwined in Perception of Sung Words: EEG and Behavioral Evidence. PLoS ONE. 2010; 5(3):e9889-.

2. Communication endophenotypes in neurodevelopmental genetic disorders:

   My postdoctoral work was focused on using EEG to investigate communication endophenotypes in children with neurodevelopmental disabilities. My collaborators and I have used time-frequency and ERP analyses of EEG data to examine on the dynamics of auditory perception and their relation to social cognition. In one study, we showed that the emotional valence of musical primes influenced the perception of emotionally-valenced facial targets in people with Williams Syndrome. These modulations were reflected in both behavioral data and EEG gamma oscillations, which are markers of cross-modal integration. As a trainee in the Rare Diseases Clinical Research Network, I also conducted a study that looked at autism spectrum features in children with single-gene disorders (Rett Syndrome and MECP2 duplication syndrome. With a novel combination of brain and behavioral methods, we demonstrated that brain responses reflecting sensitivity to the mother's voice were associated with higher social functioning, and differentiated patterns of responses for over- vs. under-expression of MeCP2 protein.

   a. Peters S, Gordon R, Key A. Induced Gamma Oscillations Differentiate Familiar and Novel Voices in Children With MECP2 Duplication and Rett Syndromes. Journal of Child Neurology. 2014 April 27; 30(2):145-152.

b. Lense M, Gordon R, Key A, Dykens E. Neural correlates of cross-modal affective priming by music in Williams syndrome. Social Cognitive and Affective Neuroscience. 2014 April; 9(4):529-537.

3. Rhythm and Language Development in Children:

   My innovative pre- and postdoctoral work laid the foundation for a long-term research program that looks at the interface between language skills and rhythm abilities. As a postdoc, I designed a study, funded by an internal grant that I co-wrote which investigates the relationship between morpho-syntactic competence and rhythm in children with typical and atypical language development. We developed a new computer-based rhythm skills assessment tool that is appropriate for children. The results showed that 48% of the variance in grammar skills was predicted by musical rhythm perception abilities in children with typical development, even after controlling for differences in IQ and socio-economic status. My current NIDCD Early Career R03, which I obtained at the end of my postdoctoral fellowship in mid-2015, extends the work to children with language impairment and investigates mechanisms underlying the correlation between rhythm and grammar. I have also conducted a meta-analysis of studies on the effects of music training on reading-related skills, which analyzed critical barriers in the literature that have precluded the demonstration of a causal influence of music treatments on language outcomes.

   a. Magne C, Jordan D, Gordon R. Speech rhythm sensitivity and musical aptitude: ERPs and individual differences. Brain and Language. 2016 February; 153-154:13-19.
   b. Gordon R, Fehd H, McCandliss B. Does Music Training Enhance Literacy Skills? A Meta-Analysis. Frontiers in Psychology. 2015 December 01; 6:-.
   c. Gordon R, Shivers C, Wieland E, Kotz S, Yoder P, Devin McAuley J.. Musical rhythm discrimination explains individual differences in grammar skills in children. Developmental Science. 2015 July; 18(4):635-644.
   d. Gordon R, Jacobs M, Schuele C, McAuley J. Perspectives on the rhythm-grammar link and its implications for typical and atypical language development. Annals of the New York Academy of Sciences. 2015 March; 1337(1):16-25.

4. Infrastructure for interdisciplinary music research:

   I lead Program for Music, Mind & Society at Vanderbilt, a trans-institutional incubator program that has engaged key players from more than 12 departments, centers and institutions across campus to expand the scope of music research across the University, promote music-research-related educational programs, and to strengthen community partnerships.

D. Additional Information: Research Support and/or Scholastic Performance

Ongoing Research Support

R03DC014802, National Institute on Deafness and Other Communication Disorders
Reyna Gordon (PI)
07/15/15-06/30/18
Rhythm in Atypical Language Development: Mechanisms and Individual Differences
Role: PI

TIPs, Vanderbilt Chancellor's Trans-institutional Programs
Eavey (PI)
07/01/15-06/30/17
The Science of Music Research: Creating a Program for Music, Mind & Society
Role: Co-Investigator

VR18434, Vanderbilt Institute for Clinical and Translational Research (VICTR)
Gordon, Reyna (PI)

03/17/16-05/31/17
Exploring genetic contributions to language and rhythm skills
Role: PI

CERC, Community Engagement Research Grant
Gordon, Reyna (PI)
01/01/16-01/01/17
SERENADE Project: Parent Child Music Classes to Promote Social and Rhythmic Engagement in Autism Spectrum Disorder
Role: PI