

# MALINDA J. MCPHERSON

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## EDUCATION & ACADEMIC POSITIONS

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<b>University of California, San Diego</b> , Department of Psychology Postdoctoral Associate, <i>Advisor: Tim Brady</i>	La Jolla, CA 2022–Present
<b>Massachusetts Institute of Technology</b> , Department of Brain and Cognitive Sciences Postdoctoral Associate, <i>Advisor: Josh H. McDermott</i>	Cambridge, MA 2022
<b>Harvard University</b> , Program in Speech and Hearing Bioscience and Technology Ph.D. <i>Advisor: Josh H. McDermott</i>	Cambridge, MA 2015–2021
<b>University of Cambridge</b> , Center for Music and Science M.Phil. <i>Advisor: Ian Cross</i>	Cambridge, UK 2014–2015
<b>Johns Hopkins University</b> B.A. in Cognitive Science, minor in Music (general and departmental honors) Research Assistant; <i>Advisor: Charles J. Limb</i>	Baltimore, MD 2010–2014 2012–2014

## GRANTS & FUNDING

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<b>Ruth L. Kirschstein Predoctoral National Research Service Award (F31)</b> National Institute on Deafness and Other Communication Disorders, National Institutes of Health, USA	2019–2022
<b>Mind Brain Behavior Interfaculty Initiative Graduate Student Award</b> Harvard University	2020
<b>Graduate Research Fellowship Program</b> National Science Foundation, USA	2015–2020
<b>Churchill Scholarship</b> , to complete an MPhil at the University of Cambridge Winston Churchill Foundation of the United States	2014–2015
<b>Bander Family Fund Award &amp; the Provost's Undergraduate Research Award</b> Johns Hopkins University	2013

## PREPRINTS

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- McPherson, M.J.**, J.H. McDermott. (2022). Invariance in pitch perception. *bioRxiv*. Under Review.
- Jacoby, N. [and 33 others, including **McPherson, M.J.**], (2021), Universality and cross-cultural variation in mental representations of music revealed by global comparison of rhythm priors. *PsyArXiv*. Under Review.

## PEER REVIEWED PUBLICATIONS

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- McPherson, M. J.**, Grace, R. C., & McDermott, J. H. (2022). Harmonicity aids hearing in noise. *Attention, Perception, & Psychophysics*, 84(3), 1016–1042.
- McPherson, M. J.**, & McDermott, J. H. (2020). Time-dependent discrimination advantages for harmonic sounds suggest efficient coding for memory. *Proceedings of the National Academy of Sciences*, 117(50), 32169–32180.
- McPherson, M. J.**, Dolan, S. E., Durango, A., Ossandon, T., Valdés, J., Undurraga, E. A., Jacoby, N., Godoy, R. A., & McDermott, J. H. (2020). Perceptual fusion of musical notes by native Amazonians suggests universal representations of musical intervals. *Nature Communications*, 11(1), 2786.
- Jacoby, N., Undurraga, E. A., **McPherson, M. J.**, Valdes, J., Ossandon, T., & McDermott, J. H. (2019). Universal and

non-universal features of musical pitch perception revealed by singing. *Current Biology*, 29(19), 3229-3243.

**McPherson, M. J.,** & McDermott, J. H. (2018). Diversity in pitch perception revealed by task dependence. *Nature Human Behavior*, 2(1), 52-66.

**McPherson, M. J.,** Barrett, F. S., Lopez-Gonzalez, M., Jiradejvong, P., & Limb, C. J. (2016). Emotional intent modulates the neural substrates of creativity: an fMRI study of emotionally targeted improvisation in Jazz musicians. *Scientific reports*, 6, 18460.

**McPherson, M. J.,** Lopez-Gonzalez, M., Rankin, S. K., & Limb, C. J. (2014). The role of emotion in musical improvisation: an analysis of structural features. *PLOS One*, 9(8), e105144.

**McPherson, M. J.,** & Limb, C. J. (2013). Difficulties in the neuroscience of creativity: Jazz improvisation and the scientific method. *Annals of the New York Academy of Sciences*, 1303(1), 80-83.

## BOOK CHAPTERS

**McPherson, M. J.,** C.J. Limb. *Improvisation: Experimental Considerations, Results, and Future Directions*. Chapter in *Foundations in Music Psychology: Theory and Research*. Eds., D. Levitin and J. Rentfrow. MIT Press, Cambridge, MA. 2019.

**McPherson, M. J.,** C.J. Limb. *Artistic and Aesthetic Production: Progress and Limitations*, Chapter in *Cambridge Handbook of the Neuroscience of Creativity*. Eds., R. Jung and O. Vartanian. Cambridge University Press, Cambridge, UK. 2018.

## SELECTED AWARDS & HONORS

Harvard University 2022 Graduate School of Arts and Sciences Commencement Marshal <i>Elected by Graduate Student Council for contributions to student life at Harvard</i>	2022
Forbes 30 Under 30 - Science	2022
Harold M. Weintraub Graduate Student Award, Fred Hutch <i>Recognized among 13 awardees (internationally) for achievement during graduate studies in biological sciences</i>	2021
MIT On the Spot Award <i>Organized events to maintain lab morale and build community during COVID-19 shutdown</i>	2020
Award for Excellence in Cognitive Science, Johns Hopkins University	2014

## MENTORING

### *Graduate*

Jacob Alappatt: Graduate Rotation Student, Harvard University (Fall 2021)

Steven Meisler: Graduate Rotation Student, Harvard University (Fall 2020)

Sara Simpson: Graduate Rotation Student, MIT (Fall 2019)

Alexander Durango: Postbaccalaureate Student, MIT (Summer 2019)

### *Undergraduate*

River Grace: Undergraduate Research Opportunities Program, MIT (Fall 2018–Summer 2021)

Sophia Dolan: Undergraduate Research Opportunities Program, Wellesley College (Spring 2018–Spring 2020)

Shuang Fan: Undergraduate Research Assistant, Berklee College of Music (Spring 2018)

Crystal Wang: Undergraduate Research Opportunities Program, MIT (Summer 2017)

Mentor, Women in STEM Mentoring Program, Harvard University (Fall 2016–Spring 2020)

## TEACHING EXPERIENCE

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**Teaching Assistant**, Brain and Cognitive Sciences Department, MIT  
*Perception*

Spring 2020

**Guest Lecturer**, Berklee College of Music  
*Human Anatomy and Physiology*

Fall 2016, Spring 2017, Summer 2017, Fall 2018

**Teaching Assistant**, Department of Cognitive Science, Johns Hopkins University  
*Topics in Music Cognition I, Topics in Music Cognition II*

Fall 2013, Spring 2014

**Teaching Assistant**, Department of Neuroscience, Johns Hopkins University  
*Introduction to Neuroscience*  
*The Nervous System I, The Nervous System II*

Spring 2013, Summer 2013, Fall 2013

Fall 2012, Spring 2013

## PROFESSIONAL ACTIVITIES, PUBLIC OUTREACH & POLICY

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### Diversity, Equity, and Inclusion

Diversity & Inclusion Badge, University of Rhode Island

2022

Co-President, Harvard LGBTQ@GSAS Association

2020–2022

Academic Chair, Harvard LGBTQ@GSAS Association

2019–2020

Facilitator, Harvard University Division of Medical Sciences Culture and Community Orientation Workshops

2020

### Science Policy

Harvard Medical School Scientific Citizenship Initiative MA State House Science and Technology Fellowship

2021

Science Advisor, Massachusetts Joint Committee on Mental Health, Substance Use and Recovery

### Science Outreach

Guest, BBC Crowd Science, “How does my radio work?”

2022

Editor, Science in the News Longform Blog, Harvard University

2018–2021

Writer, Science in the News Longform Blog, Harvard University

2020

*Conceived of and wrote a six-part special edition, “What does a scientist do?” (<https://tinyurl.com/WhatScientistsDo>)*

Panelist, Boston Museum of Science, “Ask A Scientist” series, “How do we perceive sounds?”

2020

Facilitator, “Science by the Pint” community outreach series, Harvard University

2018–2020

Certified Facilitator, Our Whole Lives Sexuality: Lifespan Sexuality Education, The First Church in Belmont

2016–2020

*Taught weekly science-based, secular, inclusive sexual health course for 8<sup>th</sup> grade students*

Writer, *The Guardian*, “Making it up as you go along: how your brain improvises”

2016

Guest, KPCC (NPR news for Southern California), AirTalk, “New study looks at brain activities of jazz musicians to find link between emotions and creativity”

2016

Facilitator, Making Neuroscience Fun, Johns Hopkins University Department of Neuroscience

2014

*Volunteered to teach Pre-K to 5<sup>th</sup> grade students about the nervous system*

Teacher, Creating Responsibility in Adolescent Sexual Health, Maryland State Juvenile Justice System

2012–2014

*Taught weekly evidence-based reproductive anatomy and sexual health course for justice-involved youth*

### Conferences

Co-Chair & Presenter, Symposium, “Online Experimentation in Audition: Recent Advances and Future Directions.”

Association for Research in Otolaryngology 46th Annual Midwinter Meeting

2023

Speech & Hearing Bioscience and Technology Distinguished Lecture Series Organizing Committee

2017

Social Media and Communications Team, Global Scholars Symposium, University of Cambridge

2015

### Peer Reviewing

Attention, Perception, & Psychophysics; Auditory Perception and Cognition; Brain Research; eLife; Journal of

Experimental Psychology: Learning, Memory, and Cognition; Music Perception; National Science Foundation; Nature

Communications; NeuroImage; PLOS Computational Biology; PLOS One; Scientific Reports

## INVITED TALKS

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Boston University, Hearing Research Center Seminar Series	2021
University of California, San Diego, Vision and Memory Lab	2021
MIT Department of Brain and Cognitive Sciences, Cog Lunch	2021
Max Planck Institute for Empirical Aesthetics	2021
Collective Intelligence 2020, Workshop on Digital Experiments on Amazon Mechanical Turk	2020
University of California, Berkeley, The Computation and Language Lab	2020
Boston University, Communication Neuroscience Research Laboratory	2019
Dartmouth College, Department of Psychological and Brain Sciences, Cognitive Brown Bag	2019
Acoustical Society of America, 177th Meeting	2019
Association for Research in Otolaryngology, MidWinter Meeting, Poster Blitz Talk	2019
MIT Department of Brain and Cognitive Sciences, Cog Lunch	2016
Harvard University Institute of Politics	2016
Society for Music Perception and Cognition Conference	2015
University of Cambridge, Churchill College Conference on Everything	2015
University of Oxford, 2 <sup>nd</sup> International Conference on Music and Consciousness	2015
University of Cambridge, Churchill College Academic Seminar Series	2015
Salzburg Global Seminar, Session 547, The Neuroscience of Art	2015

## CONFERENCE POSTERS

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- McPherson, M.J.,** J.H. McDermott. (February 2022). Invariance in pitch perception. *Association for Research in Otolaryngology, 45th Annual MidWinter Meeting*, Virtual.
- McPherson, M.J.,** R.C. Grace, J.H. McDermott. (February 2021). Harmonicity aids hearing in noise. *Association for Research in Otolaryngology, 44th Annual MidWinter Meeting*, Virtual.
- McPherson, M.J.,** S.E. Dolan, A. Durango, T. Ossandon, J. Valdez, E.A. Undurraga, N. Jacoby, R.A. Godoy, J.H. McDermott. (November 2020). Fusion of musical notes suggests universal representations of dissonance despite culture-dependent aesthetic associations. *16<sup>th</sup> Annual NeuroMusic Conference*, Virtual.
- McPherson, M.J.,** R.C. Grace, J.H. McDermott. (October 2020). Harmonicity aids hearing in noise. *Advanced Perspectives in Auditory Neuroscience*, Virtual.
- McPherson, M.J.,** J.H. McDermott. (January 2020). Harmonicity aids hearing in noise. *Association for Research in Otolaryngology, 43rd Annual MidWinter Meeting*, San Jose, CA.
- McPherson, M.J.,** J.H. McDermott. (October 2019). Pitch provides a compact code for memory storage. *Advanced Perspectives in Auditory Neuroscience*, Chicago, IL.
- McPherson, M.J.,** J.H. McDermott. (May 2019). Harmonicity aids detection of speech and other sounds in noise. *177th Meeting of the Acoustical Society of America*, Louisville, KY.
- McPherson, M.J.,** J.H. McDermott. (February 2019). Assessing pitch perception using sung responses. *Association for Research in Otolaryngology, 42nd Annual MidWinter Meeting*, Baltimore, MD.
- McPherson, M.J.,** S.E. Dolan, T. Ossandon, J. Valdez, E.A. Undurraga, N. Jacoby, R.A. Godoy, J.H. McDermott. (February 2019). Representation of dissonance is culturally invariant even though aesthetic responses to dissonance are not. *Association for Research in Otolaryngology, 42nd Annual MidWinter Meeting*, Baltimore, MD.
- Jacoby, N. (presenting author), E.A. Undurraga, **M.J. McPherson,** J. Valdez, T. Ossandon, J.H. McDermott. (February 2019). Individual differences and cross-cultural variation in pitch perception revealed by sung reproduction. *Association for Research in Otolaryngology, 42nd Annual MidWinter Meeting*, Baltimore, MD.

- McPherson, M.J.,** J.H. McDermott. (May 2018). Multiple mechanisms in pitch perception revealed by individual differences. *175th Meeting of the Acoustical Society of America*, Minneapolis, MN.
- McPherson, M.J.,** J.H. McDermott. (May 2018). The function of f0-based pitch. *175th Meeting of the Acoustical Society of America*, Minneapolis, MN.
- McPherson, M.J.,** J.H. McDermott. (February 2018). Multiple mechanisms in pitch perception revealed by individual differences. *Association for Research in Otolaryngology, 41st Annual MidWinter Meeting*, San Diego, CA.
- McPherson, M.J.,** J.H. McDermott. (February 2018). The function of f0-based pitch. *Association for Research in Otolaryngology, 41st Annual MidWinter Meeting*, San Diego, CA.
- McPherson, M.J.,** J.H. McDermott. (June 2017). Multiple pitch mechanisms revealed by effects of inharmonicity on pitch perception. *Acoustics '17, Acoustical Society of America*, Boston, MA.
- McPherson, M.J.,** J.H. McDermott. (June 2017). Multiple pitch mechanisms revealed by effects of inharmonicity. *Neuromusic VI*, Boston, MA.
- McPherson, M.J.,** J.H. McDermott. (February 2017). Effects of inharmonicity in music and speech suggest multiple pitch mechanisms. Poster. *Association for Research in Otolaryngology, 40th Annual MidWinter Meeting*, Baltimore, MD.
- McPherson, M.J.,** Cross, I. (August 2015). The Effect of Rhythmic Coordination on the Perception of Emotion in Music. *2015 Meeting of the Society for Music Perception and Cognition*, Nashville, TN.
- McPherson, M.J.,** M. Lopez-Gonzalez, S. Rankin (*presenting author*), C.J. Limb. (February 2015). Musical Features of Spontaneous Improvisation Associated with Emotional Cues. *Association for Research in Otolaryngology 38th Annual Midwinter Meeting*, Baltimore, MD.
- McPherson, M.J.,** M. Lopez-Gonzalez, S. Rankin, C.J. Limb. (August 2014). Musical Features of Spontaneous Improvisation Associated with Emotional Cues. *The 13th International Conference on Music Perception and Cognition and the 5th Conference for the Asian-Pacific Society for Cognitive Sciences of Music*. Seoul, South Korea.