MALINDA J. MCPHERSON

Massachusetts Institute of Technology
mjmcp@mit.edu | she/her

RESEARCH INTERESTS

Auditory perception and memory, music perception and cognition, cross-cultural research, psychophysics

EDUCATION

Harvard University — Cambridge, MA
Ph.D. in Speech and Hearing Bioscience and Technology — 2015–2022

University of Cambridge — Cambridge, UK
M.Phil. in Music Studies, Music and Science concentration — 2015

Johns Hopkins University — Baltimore, MD
B.A. in Cognitive Science, minor in Music (general and departmental honors) — 2014

ACADEMIC POSITIONS & RESEARCH EXPERIENCE

Massachusetts Institute of Technology, Department of Brain and Cognitive Sciences — Cambridge, MA
Postdoctoral Associate & Graduate Student; Advisor: Josh H. McDermott — 2015–2022

University of Cambridge, Centre for Music and Science — Cambridge, UK
Graduate Student; Advisor: Ian Cross — 2014–2015

Johns Hopkins University, Department of Head and Neck Surgery/Otolaryngology — Baltimore, MD
Research Assistant; Advisor: Charles J. Limb — 2012–2014

GRANTS & FUNDING

Ruth L. Kirschstein Predoctoral National Research Service Award (F31) — 2019–2022
National Institute on Deafness and Other Communication Disorders, National Institutes of Health, USA

Mind Brain Behavior Interfaculty Initiative Graduate Student Award — 2020
Harvard University

Graduate Research Fellowship Program — 2015–2020
National Science Foundation, USA

Churchill Scholarship — 2014–2015
Winston Churchill Foundation of the United States

Bander Family Fund Award & the Provost's Undergraduate Research Award — 2013
Johns Hopkins University

PREPRINTS

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

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.

AWARDS & HONORS

Harvard University 2022 Graduate School of Arts and Sciences Commencement Marshal 2022
Elected by Graduate Student Council for contributions to student life at Harvard
Forbes 30 Under 30 - Science 2022
Finalist, Harvard Horizons Scholars 2021
Harold M. Weintraub Graduate Student Award, Fred Hutch 2021
Recognized among 13 awardees (internationally) for achievement during graduate studies in biological sciences
MIT On the Spot Award 2020
Organized events to maintain lab morale and build community during COVID-19 shutdown
Advanced Perspectives in Auditory Neuroscience Conference Travel Award 2019
Association for Research in Otolaryngology Travel Award 2019
The Donald Havens Scholarship, Rassias Center Accelerated Language Program (Spanish), Dartmouth College 2019
Completed one-week intensive Spanish course to facilitate communication during fieldwork in Bolivia
Society for Education, Music, and Psychology Research (*SEMPRE*) Conference Award 2015
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

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 Spring 2013, Summer 2013, Fall 2013
The Nervous System I, The Nervous System II Fall 2012, Spring 2013

PROFESSIONAL ACTIVITIES, PUBLIC OUTREACH & POLICY

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

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

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 8th 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 5th 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

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

INVITED TALKS

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, 2nd 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

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. *16th 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 V1*, 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.