

BENJAMIN PAUL GOLD

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Montreal Neurological Institute, 3801 University Street, Room 276, Montreal, QC, H3A 2B4, Canada

EDUCATION

McGill University Ph.D., Integrated Program in Neuroscience	Montreal, QC, Canada September 2014 – 2019 (expected)
Aalto University M.Sc. in Technology with Distinction, Brain and Mind	Espoo, Uusimaa, Finland September 2013 – June 2014
Brown University B.Sc. with Honors, Cognitive Neuroscience	Providence, RI, U.S.A. September 2007 – May 2011

AWARDS AND HONORS

Graduate Fellowship National Science and Engineering Research Council, Complex Dynamics Network	September 2018 – August 2019
Jeanne Timmins Costello Fellowship McGill University Integrated Program in Neuroscience	September 2017 – August 2018
SEMPRE Young Researcher Conference Award Society for Education, Music and Psychology Research, for the 15th International Conference on Music Perception and Cognition/10th triennial conference of the European Society for the Cognitive Sciences of Music	July 2018
FENS, The Brain Prize and IBRO-PERC stipend Federation of European Neuroscience Societies Conference: Computational Neuroscience of Prediction	April 2018
Graduate Excellence Award BrainReach High Schools	August 2017
Outstanding Poster Award The Neurosciences and Music VI Conference: Music, Sound and Health	June 2017
Fulbright STEM Award for Graduate Students Fulbright Canada	September 2014 – May 2017
Graduate Fellowship (declined) National Science and Engineering Research Council, Auditory Cognitive Neuroscience Network	September 2014 – August 2015

RESEARCH EXPERIENCE

McGill University Graduate Researcher Supervisors: Dr. Robert Zatorre, Dr. Alain Dagher	Montreal, QC, Canada September 2014 – Present
University of Helsinki/Aalto University Research Assistant Supervisors: Dr. Risto Näätänen, Dr. Sari Ylinen, Dr. Elvira Brattico	Helsinki/Espoo, Finland August 2011 – July 2014
Georgetown University Research Assistant, Program in Cognitive, Computational and Systems Neuroscience Supervisors: Dr. Josef Rauschecker, Dr. Elvira Brattico	Washington, D.C., U.S.A. January 2014 – July 2014
Brown University Undergraduate Researcher, Laboratory for Neural Computation and Cognition Supervisor: Dr. Michael Frank	Providence, R.I., U.S.A. September 2010 – May 2011
Concordia University Summer Intern, Laboratory for Motor Learning and Neural Plasticity Supervisor: Dr. Virginia Penhune	Montreal, QC, Canada May 2010 – August 2010

PROFESSIONAL EXPERIENCE

Teaching Assistant: Applied Statistics for Nursing Grading and providing feedback on assignments, leading and assisting SPSS workshops, reviewing material, and creating and delivering lectures	September 2018 – December 2018, September 2017 – December 2017, September 2016 – December 2016
Co-Coordinator and Teacher, I Speak Science Designing and teaching science lessons for an organization that provides an after-school program of hands-on science lessons for young students	July 2017 – Present
English School Coordinator, BrainReach Recruiting teachers, co-organizing volunteer placements, and collecting feedback for an organization that brings neuroscience lessons to under-served schools	May 2017 – Present
Research Mentor, McGill University Supervising undergraduate and Master's student research assistants in experimental design, data processing, and analysis	October 2015 – Present

Volunteer Teacher, BrainReach Delivering regular neuroscience lessons for 4 th - or 10 th -grade students in local under-served schools	November 2014 – Present
Interviewer, Brown University Alumni Interviewing Conducting and reporting applicant interviews	August 2011 – Present
Community Organizations Coordinator, HANY Established and maintained community relationships and recruited students, workshop facilitators, and volunteers for an organization that provided French and English tutoring for refugees in Montreal	November 2016 – September 2017
Co-Founder and Volunteer Co-Coordinator, Say Ça! Co-managed tutor and mentor recruitment and training, lesson planning, feedback systems, and administration for an organization that tutors and mentors Syrian refugee teenagers in Montreal	December 2015 – July 2016
International Student Buddy, McGill University Assisted and advised new international students through their transitions to McGill and Montreal	July 2015 – May 2016
Peer Support Mentor, McGill University Mentored struggling undergraduate students	March 2015 – May 2016
Volunteer Tutor and Mentor, Homework Zone Weekly tutored and mentored a struggling 5 th -grade student in an under-served neighborhood	October 2015 – December 2015

PROFESSIONAL DEVELOPMENT

Skills of Communication Workshop One-day workshop on verbal communication tools and tips, by McGill Skillsets	February 2018
3-Minute Thesis Workshops and Competition Two workshops and a competition on effective communication skills, by the McGill 3-Minute Thesis organization	February 2018
Teaching Assistant Training One-day workshop on teaching assistant skills, by the Association of Graduate Students Employed at McGill	September 2016

Science Graduate Teaching Workshop

September 2015

Two-day intensive workshops on teaching science for university students by the Tomlinson Project in University-Level Science Education

Active Listening & Interpersonal Communication Training

March 2015

One-day intensive workshop on mentorship skills, by the McGill Staff-Student Mentoring Program

Learning to Teach Day

November 2014

One-day intensive workshop on teaching skills, by McGill Skillsets

PEER-REVIEWED PUBLICATIONS

Bianco, R., **Gold, B. P.**, Johnson, A., & Penhune, V. (in preparation). Prediction and reward in music: how can music maximize movement sequence learning?

Fasano, M.C., Glerean, E., **Gold, B. P.**, Sams, M., Rauschecker, J., Sheng, D., & Brattico, E. (submitted). Inter-subject synchronization of brain responses after multimodal learning: a behavioral and neuroimaging study following the process of learning to play a sonata by pianists.

Gold, B. P., Mas-Herrero, E., Zeighami, Y., Benovoy, M., Dagher, A., & Zatorre, R. J. (submitted). Music as neural reward: Musical reward prediction errors engage the nucleus accumbens and motivate learning.

Shany, O., Singer, N., **Gold, B. P.**, Jacoby, N., Hendler, T., & Granot, R. (submitted). Surprise-related activity in the nucleus accumbens associates with music-induced pleasantness.

Bogert, B., Numminen-Kontti, T., **Gold, B.**, Sams, M., Numminen, J., Burunat, I., Lampinen, J., & Brattico, E. (2016). Hidden sources of joy, fear, and sadness: Explicit versus implicit neural processing of musical emotions. *Neuropsychologia*, 89, 393-402. 10.1016/j.neuropsychologia.2016.07.005.

Kliuchko, M., Heinonen-Guzejev, M., Monacis, L., **Gold, B. P.**, Heikkilä, K. V., Spinosa, V., Tervaniemi, M., & Brattico, E. (2015). The association of noise sensitivity with music listening, training, and aptitude. *Noise and Health*, 17(78), 350-357. 10.4103/1463-1741.165065.

Gold, B. P., Frank, M. J., Bogert, B., & Brattico, E. (2013). Pleasurable music affects reinforcement learning according to the listener. *Frontiers in Auditory Cognitive Neuroscience*, 4, 541. 10.3389.2Ffpsyg.2013.00541.

CONFERENCE PRESENTATIONS

Gold, B. P., Neumann, K. A., Litrico, C., Pearce, M. T., Mas-Herrero, E., Dagher, A. T., & Zatorre, R. J. (2018, July). *Predictive processing in music liking and arousal: influences of syntactic and explicit music predictability*. Poster at the 15th International Conference on Music Perception and Cognition/10th triennial conference of the European Society for the Cognitive Sciences of Music, Montreal, Quebec, Canada.

Gold, B. P., Neumann, K. A., Litrico, C., Pearce, M. T., Mas-Herrero, E., Dagher, A. T., & Zatorre, R. J. (2018, April). *Predictability and uncertainty in the pleasure of music: neural, psychophysiological, and behavioral effects*. Poster at the twelfth semiannual Brain Conference: Computational Neuroscience of Prediction, Copenhagen, Denmark.

Gold, B. P., Mas-Herrero, E., Zeighami, Y., Benovoy, M., Dagher, A., & Zatorre, R. J. (2017, June). *Can music convey reward prediction errors? A formal test of the effects of musical expectations in reward-related brain structures*. Poster and oral presentation at the sixth triennial meeting of the Neurosciences and Music: Music, Sound and Health, Boston, Massachusetts, U.S.A.

Gold, B. P., Mas-Herrero, E., Zeighami, Y., Benovoy, M., Dagher, A., & Zatorre, R. J. (2017, June). *Can music convey reward prediction errors?* Poster at Neuropsychology Day, Montreal, Quebec, Canada.

Gold, B. P., Bogert, B., Frank, M. J., & Brattico, E. (2014, June). *Individual differences in reward-related activity during music and learning*. Poster at the Neurodynamics of Language and Music Symposium, Helsinki, Finland.

Gold, B. P., Bogert, B., Frank, M. J., & Brattico, E. (2014, May-June). *Pleasurable music enhances reinforcement learning through the reward system and related structures*. Poster at the fifth triennial meeting of the Neurosciences and Music: Cognitive Stimulation and Rehabilitation, Dijon, France.

Gold, B. P., Frank, M. J., Bogert, B., & Brattico, E. (2013, November). *Pleasurable music affects reinforcement learning according to the listener*. Poster at the second annual Brain Research at Aalto University and University of Helsinki (BRAHE) symposium, Helsinki, Finland.

Gold, B., Frank, M., Bogert, B., & Brattico, E. (2013, October). *The power of music can help us learn*. Poster at the 40th anniversary meeting for the Brain Research Society of Finland, Helsinki, Finland.

Gold, B. P., Frank, M., Bogert, B., & Brattico, E. (2013, September). *Pleasurable music affects reinforcement learning according to the listener*. Poster at the final conference of the initial training network for Europe, Brain and Music (EBRAMUS): New Perspectives for Stimulating Cognitive and Sensory Processes, Pavia, Italy.

Gold, B., Frank, M., Bogert, B., & Brattico, E. (2013, June). *Pleasurable music affects reinforcement learning according to the listener*. Poster and oral presentation at the Third International Conference on Music and Emotion, Jyväskylä, Finland.

Gold, B., Frank, M., & Brattico, E. (2012, July). *Experiential effects of musical pleasure on dopaminergic learning*. Poster at the 12th International Conference on Music Perception and Cognition/8th Triennial Conference of the European Society for the Cognitive Sciences of Music, Thessaloniki, Greece.

Gold, B., & Brattico, E. (2012, March). *The effects of musical pleasure on dopaminergic learning*. Poster at the Monte Verità Workshop on Music in Neuroscience, Ascona, Switzerland.

Gold, B. P., Frank, M. J., & Brattico, E. (2012, March). *The effects of musical pleasure on dopaminergic learning*. Poster at the first annual Brain Research at Aalto University and University of Helsinki (BRAHE) symposium, Helsinki, Finland.

Gold, B., Spilka, M., Steele, C. J., & Penhune, V. B. (2010, August). *From Bandleader to follower: Are musicians expert imitators?* Poster at the Auditory Cognitive Neuroscience Summer Workshop, Hamilton, Ontario, Canada

PUBLIC ENGAGEMENT

Dorémi documentary In development
Demonstrated my research in a documentary about music and music appreciation

Invited talk: Center for Music in the Brain, Aarhus April 2018
Presented my research in a public talk at the Center for Music in the Brain at Aarhus University, Denmark

3-Minute Thesis Competitions November 2017,
February 2018
Presented my research in a brief and general manner to a public audience during McGill's neuroscience and university-wide 3-Minute Thesis Competitions

Great American Railroad Journeys: Montreal January 2018
Demonstrated and discussed my research as a feature of Montreal on a BBC travel series

SKILLS AND INTERESTS

Programming languages/software: Matlab, FSL, Presentation, SPSS, SPM, Windows OS, Linux OS

Languages: English (native), Italian (intermediate), Finnish (intermediate)

Interests: Semi-professional musician (trombone, bass guitar), science education/outreach, squash