Dimitri L. Brunelle

Curriculum Vitae

Contact Information

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Education

08/2023 – present	Au.D./Ph.D., Hearing Science, University of South Florida
08/2022 - 01/2023	Ph.D., Neuroscience, University of Illinois at Urbana-Champaign
05/2017 - 08/2021	B.A., Psychology; *Honors*; University of South Florida

Undergraduate Honors Thesis: "Towards a Neural Representation of Music-Language Overlap: The Harmonic Prediction Violation Norming Model."

Grants and Awards

University Graduate Fellowship, 2023-2024
USF Psychology Honors Graduate, 2021
PAR Scholarship for Excellence in Psychology Recipient, 2021
Psi Chi International Honor Society in Psychology Undergraduate Research Grant, 2020-2021
Florida Bright Futures Academic Scholar, 2017-2021

Research Experience

Research Intern to Dr. Joseph P. Walton*,* University of South Florida (Dept. of Communication Sciences and Disorders, Dept. of Medical Engineering), April 2018 – August 2022, January 2023 – present

Undergraduate Research Assistant Volunteer, April 2018 – January 2019

Researched neural assays of tinnitus and age-related hearing loss in the mouse model within the Global Center for Hearing and Speech Research auditory neuroscience laboratory. Conducted experiments involving autonomic behavior and operant conditioning utilizing MATLAB software.

Lead Research Assistant Supervisor (paid), January 2019 – April 2021

Oversaw all aspects of the behavioral research subdivision of the laboratory. Managed 20+ research assistants, scheduled experiments performed on a weekly basis, and analyzed and interpreted the data with R. Conducted experiments involving evoked potentials (auditory brainstem responses and auditory steady-state responses).

Research Specialist (paid), April 2021 – August 2022, January 2023 – present

Conducted experiments involving extracellular electrophysiology. Constructed novel behavioral assessments for signal-in-noise detection in the mouse model. Developed a robust machine learning algorithm for classification of the acoustic startle reflex. Wrote analysis software for behavioral and active avoidance apparatuses with R.

Research Intern to Dr. Timothy J. Fawcett*,* University of South Florida (Research Computing), February 2023 – present

Conducted analyses for the publication of electrophysiology data. Utilized functional programming techniques to allow for many types of data to be statistically transformed, including combinatorics and bootstrapping. Interfaced with the CIRCE research cluster to execute massive computation jobs.

Graduate Research Assistant to Dr. Daniel A. Llano, University of Illinois at Urbana-Champaign (Neuroscience Program, Dept. of Molecular and Integrative Physiology), August 2022 – January 2023

Studied the functional connectivity of thalamocortical circuitry and the thalamic reticular nucleus in the auditory system. Learned techniques involving slice physiology, patch clamp electrophysiology, laser photostimulation, and flavoprotein imaging. Gained proficiency in extracting the colliculo-thalamo-cortical slice for studying connectivity in the central auditory pathway.

Undergraduate Research Assistant to Dr. Elizabeth R. Schotter, University of South Florida (Dept. of Psychology), April 2019 – July 2021

Undergraduate Research Assistant Volunteer, April 2019 – July 2021

Researched preview benefit related to eye movements, and semantic and plausibility parafoveal processing during natural reading within the Eye Movements and Cognition laboratory. Conducted experiments working with human participants involving eye-tracking, electroencephalography, and plausibility and cloze norming.

Honors Thesis Mentee, January 2020 – January 2021

Researched the neuro-cognitive overlap in prediction between music and language. Developed a harmonic cloze norming model that enables musical and linguistic prediction to be studied in analogous ways.

Publications

1. Fawcett T.J., Longenecker R.J., **Brunelle D.L.**, Berger J.I., Wallace M.N., Galazyuk A.V., Rosen M.J., Salvi R.J. and Walton J.P. (2023). Universal automated classification of the acoustic startle reflex using machine learning. *Hearing Research*, *428*, 108667. https://doi.org/10.1016/j.heares.2022.108667

2. **Brunelle D.L.** and Llano D.A. (2023). Role of audio-somatosensory corticothalamic circuit integration in analgesia. *Cell Calcium, 111*, 102717. https://doi.org/10.1016/j.ceca.2023.102717

3. **Brunelle D.L.**, Park C.R., Fawcett T.J. and Walton J.P. Signal-in-Noise Detection Across the Lifespan in a Mouse Model of Presbycusis (Under review in *Neurobiology of Aging*). https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4402166

4. Fawcett T.J., **Brunelle D.L.** and Walton J.P. Age-related alteration in sound-evoked local field potentials in the inferior colliculus of the CBA/CaJ mouse. (In preparation for *Neurobiology of Aging*).

Journal Reviews

European Journal of Neuroscience, *Hearing Research*

Poster Presentations

1. **Brunelle D.L.**, Lai C., Brancher S., Cooper C., Jones T., Engel J., May B. and Walton J.P. Detecting Tinnitus in Mice: Proof of Concept using an Active Avoidance Paradigm. USF Undergraduate Research Conference, Tampa, FL, April 2019.

2. **Brunelle D.L.** and Schotter E.R. Comparing Silent vs. Oral Reading: Duration and Accuracy Using Parafoveal Vision. Florida Psycholinguistics Meeting, Miami, FL and USF Psychology Expo, Tampa, FL, November 2019.

3. **Brunelle D.L.**, Payne B.R., Bugos J.A. and Schotter E.R. A Melodic Plausibility and Cloze Norming Model. Florida Psycholinguistics Meeting (virtual conference), October 2020.

4. **Brunelle D.L.**, Park C.R., Fawcett T.J. and Walton J.P. Exposure to an Augmented Acoustic Environment Improves Signal-in-Noise Detection in Old CBA/CaJ Mice. Association for Research in Otolaryngology Midwinter Meeting (virtual conference) and USF Undergraduate Research Conference (virtual conference), February 2021.

5. Reith M., **Brunelle D.L.**, Park C.R. and Walton J.P. Age Related Changes in Signal-in-Noise Perception Assessed by Modification of the Startle Reflex Response. Association for Research in Otolaryngology Midwinter Meeting (virtual conference), February 2021.

6. Park C.R., Longenecker R.J., **Brunelle D.L.**, Reith M. and Walton J.P. Exposure to a Temporally Modulated Augmented Acoustic Environment Improves Gap Detection in CBA/CaJ Mice. Association for Research in Otolaryngology Midwinter Meeting (virtual conference), February 2021.

7. **Brunelle D.L.**, Park C.R., Fawcett T.J. and Walton J.P. Exposure to a Multi-Frequency Signal-in-Noise Augmented Acoustic Environment Improves Signal-in-Noise Detection in Aged CBA/CaJ Mice. Association for Research in Otolaryngology Midwinter Meeting (virtual conference), February 2022.

8. Franco-Waite L., Fawcett T.J., **Brunelle D.L.**, Tandel V., Vargas A. and Walton J.P. Neural Correlates of Signal-in-Noise Processing Improved following Treatment with a Targeted Augmented Acoustic Environment. Association for Research in Otolaryngology Midwinter Meeting (virtual conference), February 2022.

9. **Brunelle D.L.**, Franco-Waite L., Park C.R., Fawcett T.J., Vargas A. and Walton J.P. Neural Correlates of Signal-in-Noise Processing Improve Following Treatment with a Targeted Augmented Acoustic Environment: A Behavioral and Physiological Approach. USF Health Research Day, Tampa, FL, February 2022 and USF Undergraduate Research Conference, Tampa, FL, April 2022.

10. McDaniel D., Park C.R., **Brunelle D.L.**, Chang J., and Walton J.P. Tinnitus Detection in Mice Using an Auditory Active Avoidance Shuttle Box Test. Association for Research in Otolaryngology Midwinter Meeting (virtual conference), February 2022 and USF Undergraduate Research Conference, Tampa, FL, April 2022.

11. Park C.R., **Brunelle D.L.**, Willott J.F. and Walton J.P. Modulation of the Acoustic Startle Response by a Background Noise Changes Over the Life Span of CBA/CaJ Mice. Association for Research in Otolaryngology Midwinter Meeting, Orlando, FL, February 2023.

12. Franco-Waite L., Fawcett T.J., **Brunelle D.L.**, Vargas A. and Walton J.P. Exposure to a signal-in-noise augmented acoustic environment improves tone-in-noise detection in a mouse model of age-related hearing loss. Association for Research in Otolaryngology Midwinter Meeting, Orlando, FL, February 2023 and USF Health Research Day, Tampa, FL, February 2023.

13. **Brunelle D.L.**, Park C.R., Fawcett T.J. and Walton J.P. Signal-in-Noise Detection Across the Lifespan in a Mouse Model of Presbycusis. USF Graduate Student Research Symposium, Tampa, FL, March 2023.

14. **Brunelle D.L.**, Fawcett T.J. and Walton J.P. Age-induced modulation in sound-evoked local field potentials in the inferior colliculus of CBA/CaJ mice. Society for Neuroscience Meeting and Advances and Perspectives in Auditory Neuroscience Meeting, Washington D.C., November 2023 (to be presented).

Technical Skills

R, Bash, Python, MATLAB, RPvdsEx, ImageJ, MultiClamp, GraphPad Prism, SPSS, Adobe Photoshop

Activities

School of Music Student, University of South Florida, January 2019 – January 2020
Studied music at the university level for a year. Performed in numerous ensembles both at USF and in the Tampa Bay community. Currently an actively performing saxophonist in Tampa Bay.

Feeding Tampa Bay, Tampa, FL, August 2020
Participated in providing meals to families-in-need in Tampa Bay.

Carrollwood Winds, Tampa, FL, December 2018 – June 2019
Performed wind ensemble repertoire in a community band for concerts which were free to the public.