

Part I: Contributions to Research and Development

b) Articles submitted to refereed journals

- Segalowitz, S. J., **Sternin, A.**, Lewis, T. L., Dywan, J., & Maurer, D. (2015). Electrophysiological Evidence of Altered Visual Processing in Adults who Experienced Visual Deprivation During Infancy. *Under Review – Neuropsychologia: NSY-D-15-00682*. (Undergraduate work, ~20 pages)

c) Other refereed contributions

papers in refereed conference proceedings

- Stober, S., **Sternin, A.**, Owen, A.M., Grahn, J.A. (2015). Towards Music Imagery Information Retrieval: Introducing the OpenMIIR Dataset of EEG Recordings from Music Perception and Imagination. *Proceedings of the 16th International Society for Music Information Retrieval Conference. Malaga, Spain*. (Master's work)

- **Sternin, A.**, Stober, S., Owen, A.M., Grahn, J.A. (2015). Tempo Estimation from the EEG signal during perception and imagination of music. *Proceedings of the 1st International Workshop on Brain-Computer Music Interfacing. Plymouth, UK*. (Master's work)

oral presentations

- Stober, S.*, **Sternin, A.**, Owen, A.M., Grahn, J.A. (2015). Similarity and feature learning for EEG recordings of music perception and imagination. *Fifth Annual Cognitive Based Music Informatics Research – Provincial*. (Master's Work) – **Awarded the Best Paper Award**

- **Sternin, A.***, Stober, S., Owen, A.M., Grahn, J.A. (2015). Tempo Estimation from the EEG signal during perception and imagination of music. *First International Workshop on Brain-Computer Music Interfacing – International*. (Master's Work)

poster presentations

- **Sternin, A.***, Stober, S., Owen, A.M., Grahn, J.A. (2015). Classifying perception and imagination of rhythms and speech from EEG. *Inaugural Brain and Mind Symposium – Institutional*. (Master's Work)

- **Sternin, A.***, Stober, S., Owen, A.M., Grahn, J.A. (2015). Classifying Perception and Imagination of Music from EEG. *Society for Music Perception and Cognition 2015 – International*. (Master's Work)

- **Sternin, A.***, Segalowitz, S. J., Lewis, T. L., Dywan, J., & Maurer, D. (2014). Electrophysiological evidence of altered visual processing in adults with blocked pattern vision during infancy. *Society for Psychophysiological Research (SPR) 54th annual meeting – International*. (Undergraduate Work)

- **Sternin, A.***, Segalowitz, S. J., Lewis, T. L., Dywan, J., & Maurer, D. (2014). Electrophysiological evidence of altered visual processing in adults with blocked pattern vision during infancy. *Compute Ontario Research Day 2014 – Regional*. (Undergraduate Work)

d) Non-refereed contributions

posters

- **Sternin, A.***, Stober, S., Owen, A.M., Grahn, J.A. (2015). Differentiating Music Perception and Imagination Using EEG-processing. *Lake Ontario Visionary Establishment 44th Annual Conference – Provincial*. (Master's Work)

- **Sternin, A.***, Segalowitz, S. J., Lewis, T. L., Dywan, J., & Maurer, D. (2014). Electrophysiological evidence of altered visual processing in adults with blocked pattern vision during infancy. *Southern Ontario Neuroscience Association – Provincial*. (Undergraduate Work).

Part II: Most significant contributions to research and development

1. In June 2015 I was the sole representative of my lab to present at the first international workshop on Brain-Computer Music Interfacing (BCMI 2015). I presented my first year Master's work. Previously, classification of EEG relied on frequency band modulation. We created a novel analysis. Using autocorrelations on event-related potentials we estimated the tempo of the perceived or imagined music. This novel approach generated considerable interest at BCMI 2015. The connections I made at BCMI 2015 have made collaboration with researchers from international institutions possible.

2. During my NSERC undergraduate student research award in 2013, I analyzed EEG data from

adults born with bilateral cataracts who were fitted with corrective lenses before age one. We explored how early visual deprivation affected the organization of their visual system. Although patients performed normally on visual behavioural tasks, their EEG results showed they processed the stimuli differently from controls. I wrote up these results in my undergraduate thesis and in a manuscript (*Electrophysiological Evidence of Altered Visual Processing in Adults who Experienced Visual Deprivation During Infancy*) submitted to *Neuropsychologia*.

3. The paper (*Towards Music Imagary Information Retrieval: Introducing the OpenMIIR Dataset of EEG Recordings from Music Perception and Imagination*), written together with Dr. Sebastian Stober, was accepted to the 16th International Society for Music Information Retrieval Conference. We introduced our music perception and imagination data (OpenMIIR dataset), discussed preliminary analyses and suggested future directions. This dataset contributes to the growing trend to make raw data and analyses publicly available.

Part III: Applicant's statement

Research Experience

In 2011 I began volunteering at Brock University in Dr. Sid Segalowitz's lab. I designed and debugged an automated EEG processing program that is now used in all of the lab's analysis procedures. In the process I became comfortable programming in MATLAB, Octave and EEGLab, which are widely used for EEG analyses. I then completed my honours degree with Dr. Segalowitz. I learned how to run a project from start to finish, and how to use multiple approaches, including event-related potential techniques and source localization, to extract all possible information from the dataset. While working in the lab I became an expert in independently collecting EEG data with the BioSemi EEG system.

In 2014, I began a Master's degree at the University of Western Ontario. I worked with a post-doctoral fellow to design an experiment to address the exploratory nature of our research question which examines what makes perceived and imagined music most identifiable from EEG data alone. I've learned about the complications of testing humans – from writing ethics proposals to troubleshooting equipment and clearly explaining tasks. As this was an exploratory study and few studies have conducted similar experiments, we needed to be creative in our data analysis. By working with other students, post-doctoral fellows and senior researchers I have learned many techniques for approaching a novel research question including how to use new data to inform task modifications that fine tune our investigation. We have submitted preliminary results as short papers (BCMI 2015, ISMIR 2015) and each one has taught me to frame my research for different audiences (computer scientists, musicians, artists) and write to a deadline.

Relevant Activities

As an undergraduate student, I founded and was president of a student club (Brock Hillel) for three years. We ran social and educational events for Jewish students and the campus community. We were awarded Best New Club of the Year and Best Event of the Year. In my final year I was a representative in the University Senate and sat on the Student Appeals Committee. In these roles I brought the student's perspective to the issues being discussed. I was also a member of the Student Union Academic Affairs Committee and helped organize the university's first student run teaching awards.

At the University of Western Ontario, I am also involved in the campus community. As a teaching assistant for Research Methods, I taught 30 students every week about statistics and experimental design. In April 2015, I was nominated for a teaching award. At the end of the year, I was a member of the Graduate Teaching Awards Committee run by the Society of Graduate Studies.

The interest generated by my talk at BCMI 2015 resulted in an interview for a German online science blog associated with the newspaper Zeit. I was also a member of the Program Support Team for the Society for Music Perception and Cognition conference (August 2015, Nashville, TN).