BIOGRAPHICAL SKETCH

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NAME: Brozdowski, Chris

eRA COMMONS USER NAME (credential, e.g., agency login): CBrozdowski

POSITION TITLE: Neuroscience Data Engineer

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

INSTITUTION AND LOCATION	DEGREE (*if applicable*)	Completion Date MM/YYYY	FIELD OF STUDY
University of Connecticut, Storrs	B.S	05/2013	Cognitive Science
University of California, San Diego & San Diego State University	Ph.D.	08/2018	Language and Communicative Disorders
RWTH Aachen University, Aachen, Germany	Postdoctoral	10/2019	Mechanolinguistics of Sign
Vanderbilt University, Nashville	Postdoctoral	10/2021	Neuroscience of Literacy

A. Personal Statement

In my career, I've cultivated two domains of expertise. First, my projects across pre- and postdoctoral work examined the cognitive science topics in Deaf and Hard of Hearing populations through behavioral and neuroimaging studies. My predoctoral work investigated the cognitive impacts of native American Sign Language exposure for Deaf adults, including spatial cognition and predictive processing. In my postdoctoral work, these questions extended to gesture production and the development of literacy among Hard of Hearing children. My various positions have fostered a second expertise in the research infrastructure used to standardize processes, expedite development, and promote collaborative uses of data. I developed tools to automate gesture transcription, stimulus presentation, testing score retrieval, etc. In each case, I focused on usability from the perspective of a new lab member. At DataJoint, I've continued this emphasis on research efficiency through approachable tools via DataJoint Elements, a collection of open-source packages to help scientists build transparent and reproducible computational workflows. With Element DeepLabCut, I built a pipeline for managing pose estimation models and results, while maintaining an open and productive dialog with our userbase. My research background gives me a strong understanding of how scientists with little technical training can benefit from automation. The technical, communication, and mentoring skills I've required over the course of my career allow me to generate user-friendly tools, successfully contributing to the ongoing research project.

1. Emmorey, K., **Brozdowski, C.**, & McCullough, S. (2021). The neural correlates for spatial language: Perspective-dependent and -independent relationships in American Sign Language and spoken English, *Brain and Language*, 223, 105044.
2. **Brozdowski, C.**, & Booth, J. R. (2021). Reading skill correlates in frontal cortex during semantic and phonological processing.
3. **Brozdowski, C.** & Emmorey, K. (2020) Shadowing in the manual modality. *Acta Psychologica*, 108, 103092.
4. **Brozdowski, C.**, Secora, K., & Emmorey, K. (2019). Assessing the Comprehension of Spatial Perspectives in ASL Classifier Constructions. *The Journal of Deaf Studies and Deaf Education* 24(3), 214-222.

B. Positions, Scientific Appointments, and Honors

Positions and Employment

2010–2013	Research Assistant, Various Labs, University of Connecticut, Storrs, CT
2013–2018	Graduate Researcher, SLHS, San Diego State University, San Diego, CA
2018–2019	Researcher and Lecturer, RWTH Aachen University, Aachen, Germany
2019–2021	Researcher, Dept of Psych. & Human Dev't, Vanderbilt University, Nashville, TN
2021–	Neuroscience Data Engineer, DataJoint, Houston, TX

Honors and Awards

2012	University of Connecticut Summer Undergraduate Research Fund Recipient, Storrs, CT
2013	Honorable Mention, National Science Foundation Graduate Research Fellowship Program
2016	Travel Award, Theoretical Issues in Sign Language Research, Melbourne, ASTL.
2018	Travel Award, University of Michigan NIH Training Course for fMRI, Ann Arbor, MI

C. Contribution to Science

1. Scientists often find idiosyncratic solutions to meet the needs of unique, innovative experiments. Bespoke time-consuming solutions sometimes reinvent well-validated industry standards, impeding reproducibility, collaboration, and open science. To address these issues, the DataJoint team is developing a browser-based cloud-computation platform (i.e., Works) that would allow researchers to upload data into well-validated table architectures and automate common preprocessing steps. Works would cut down on individual development and processing time, as well as open projects to collaborators for easy replication and reanalysis. This centralized vision for data managment and workflow automation relies on working with (a) experts in the respective modalities to converge on useful pipelines that can accomodate variability across experiments, (b) other tool developers to ensure interoperability and (c) end-users to ensure that the finished product is both managable and transparent for researchers with little computer science training.

2. Deafness and sign language exposure, both independently and jointly, reshape how individuals engage with the world. Spatial cognition serves as a clear example. To describe spatial relationships, American Sign Lanugage users use the space in front of themselves in an analog mapping to real world referents. In these Classifier Constructions, it's common to describe the world from one's own perspective. For the interlocutor, accomodating the signer's perspective is slower (Brozdowski, Secora, & Emmorey, 2019) and entails increased neural activation in the superior pareital lobule (Emmorey, Brozdowski, & McCullough, 2021).

    a. Emmorey, K., **Brozdowski, C.**, & McCullough, S. (2021). The neural correlates for spatial language: Perspective-dependent and -independent relationships in American Sign Language and spoken English, *Brain and Language*, 223, 105044.
    b. **Brozdowski, C.**, Secora, K., & Emmorey, K. (2019). Assessing the Comprehension of Spatial Perspectives in ASL Classifier Constructions. *The Journal of Deaf Studies and Deaf Education* 24(3), 214-222.

3. Prevailing theories of language comprehension and literacy development are often uniqely supported with evidence from hearing spoken language users. By extending research to include signers and deaf individuals, researchers can test the boundaries of these theories. For example, evidence suggests that spoken language users rely on motor simulation (i.e., subvocal immitation) for immediate comprehension. Under similar circumstances in the manual modality, nonsigners, but not signers, demonstrated key markers of motor simulation (Brozdowski & Emmorey, 2020). In the domain of literacy, many theories ephasize the interaction between orthography, phonology, and semantics. This body of work describes the reading acqusition process as a shift from reliance on ortho-phonological to ortho-semantic pathways (Brozdowski & Booth, 2021). Ongoing data collection will examine the impacts of varying levels of deafness and sign language exposure in a logitudinal neuroimaging study.

a. **Brozdowski, C.**, & Booth, J. R. (2021). Reading skill correlates in frontal cortex during semantic and phonological processing.
b. **Brozdowski, C.** & Emmorey, K. (2020) Shadowing in the manual modality. *Acta Psychologica*, 108, 103092.

D. Additional Information: Research Support and/or Scholastic Performance