Brady M. Chisholm

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Research Interests

My research interests are motivated by a desire to understand the inner workings deep in the human brain and how it perceives, interacts, and understands the world at every instant. During my time in Dr. Andrew Oxenham's lab, I engaged in research on auditory perception, which exposed me to new research in computational neuroscience that began my interest in neural mechanisms. My goal after graduation is pursuing Ph.D. research that leverages AI, machine learning, and other computational methods to help model and understand biological systems in humans and animals. By combining computational neuroscience and machine learning, I hope to contribute to research that helps explain how neural activity is transformed into behavior and decision making processes.

My goal is to pursue a Ph.D. where I am able to contribute to the development of computational models that help decode brain function, and push for breakthroughs in our current understanding of cognitive processes and neuroanatomy.

Education

University of Minnesota Twin-Cities, Minneapolis, MN 2023–exp.2025
Bachelor of Science: Psychology Minor: Computer Science
University Honors Major
- My Honors thesis is a work in progress in Professor Jean-Paul Noel's Neuroscience lab at the University of Minnesota. It is planned to be complete in December of 2025.
- **Relevant coursework:** Regression and Correlated Data, Calculus I, Creating Reproducible Research Using R, Biopsychology, Discrete Structures (I.P.), Research Practicum (I.P.)

Gustavus Adolphus College, St. Peter, MN 2022-2023
- Attended one year before transferring to University of Minnesota, Twin Cities
- Participated in two semesters of research apprenticeship within the psychology department, paired with faculty in progressing their research
- Awarded multiple semesters of grant funding for research
- **Relevant coursework:** Special Seminar: Attention, Latin I & II, <Stats 101 Name?>
- Mens Varsity Swim & Dive Competitor

Experience

Research Assistant, UMN Department of Neuroscience January 2025–Present
Dr. Jean-Paul Noel Cognitive and Systems Neuroscience Laboratory
- Working on a team focused on decoding neural activity and decision making in mice

Research Assistant, UMN Psychology Department December 2023–Present
Dr. Andrew Oxenham's Auditory Perception and Cognition Laboratory
- Data collection protocol; EEG, audiograms
- Statistical analysis: GAM, GCA, ICA, time coursed data, linear regression, ANOVA
- Various independent projects

Research Assistant, UMN Department of Ecology, Evolution and Behavior June 2024-August 2024
Dr. Mark Bee's Animal Communication Laboratory
- Seasonal appointment during peak frog season
- Animal subject handling of tree frogs, *Hyla chrysoscelis* and *Hyla versicolor*

- Implementation of strict experiment protocol for animal subjects
- Assisted with exploratory statistical analysis and visualization of behavioral data

Mental Health Advocate II, Supportive Living Solutions, Minneapolis June 2023–October 2024
- Handled medication management for over 40 residents
- Assisted residents with appointment compliance, government paperwork
- Helped plan and implement resident activities and events
- Designated trainer for new staff

Research Assistant, Psychology Department, Gustavus Adolphus College December 2022-May 2023
Lauren Hecht, Ph.D. Attention Lab
- Led piloting of new behavioral experiment paradigm for entomophobic responses
- Designed and carried out pilots with human subjects involving *Gromphadorhina portentosa*, Madagascar hissing cockroach. Promising pilot results

Grants and Awards

Career Grant Monies Awarded: $5,000

Undergraduate Research Opportunities Project Grant, University of Minnesota May, 2024
- Awarded summer research grant amounting $2,100
- Supported **Analysis of Pupillometry Data** with Juraj Mesik in the Auditory Perception & Cognition Lab at University of Minnesota

Deans First-Year Research and Academics Scholarship, University of Minnesota January, 2024
- $900 Academic Scholarship awarded supporting research with faculty
- Beginning of work with Dr. Andrew Oxenham in the Auditory Perception and Cognition Lab, assisted in EEG and pupillometry data analysis; pipelining and cleaning of pupillometry data
- Assisted in data collection and implementation of experiment protocol
- Gave a lab presentation linked here
- Coded for analysis implementing a baseline correction of pupillometry data

Residential Service Award, Supportive Living Solutions February, 2024
- Unanimously awarded from 5 site-directors to outstanding an employee from residential service at Supportive Living Solutions
- Given on basis of outstanding resident care and role model employee to peers

Presidential Research Grant, Gustavus Adolphus College May, 2023
- Awarded summer research grant proposal amounting $1,500
- In support of previous Spring semester research

Swanson-Holcomb Undergraduate Research Grant, Gustavus Adolphus College January, 2023
- Awarded a semester of funding amounting $500 to pursue research with Dr. Lauren Hecht
- Designed and piloted a new physiological experiment paradigm for assessing the effect of the rubber hand illusion on entomophobic responses in college-aged participants

Professional Membership & Service

Boy Scouts of America 2021
Eagle Scout

Projects

A GAM Analysis of Pupillometry Data 2024
- An analysis of fatigue effects in pupillometry data with a GAM model

Publications & Presentations

Published

In-Progress

1. Brady M. Chisholm, Juraj Mesik. *An Analysis of Pupillometry Data from a Speech Paradigm*. Nov 2024

Posters + Presentations

2. Registered poster presenter for ASA 2025, *Analysis of Pupillometric Fatigue in Listening Effort*

1.
Brady M. Chisholm, Lauren Hecht, *Entomophobic Responses and the Rubber Hand Illusion,* Spring Research Day, Gustavus Adolphus College, May 2023

Skillsets & Technologies

Programming	Languages: MATLAB, Python, R, HTML
Software	Tools: MATLAB, Git, LaTeX Specializations: EEG data collection, CAD, animal subject handling, audio-grams, audio equipment calibration, chemical lab practices