Praveen Prem

MSc Student in Neuroscience
Neuroscience & Mental Health Institute
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LinkedIn
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Research Interests

Cognitive Neuroscience: Decision-making, value computation, cognitive effort, self-regulation, psychological distance and abstraction, intertemporal choice

Neuroimaging Methods: fMRI (resting-state, task-based, connectivity, MVPA, univariate), sMRI (voxel- and surface-based morphometry, brainstem imaging), dMRI (deterministic tractography), EEG (ERP)

Education & Training

2025 – 2026 (expected) — *MSc, Neuroscience*, **University of Alberta**, Edmonton, Canada
Thesis (working title): *Neural Encoding of Statistical Learning Processes*
Graduate advisors: Drs. Jacqueline Cummine and Kyle Nash

2023 – 2025 — *Pre-doctoral Research Assistant* (full-time), **University of Alberta**, Edmonton, Canada
Supervisor: Dr. Jacqueline Cummine

2021 – 2023 — *BSc, Psychology (Specialization)*, **University of Alberta**, Edmonton, Canada

2019 – 2021 — *BSc, Clinical Psychology*, **Amity University**, Mumbai, India (transferred out)

Honors and Scholarships

2021 — International Undergraduate Transfer Scholarship
University of Alberta

Publications

Google Scholar
orcid.org/0009-0002-6475-041X
[*equal contribution, †mentee]

Peer-reviewed Journal Articles

2025 — **Neuroanatomical correlates of visual and auditory statistical learning: Cortical and subcortical volume predictors**
Prem, P., Saggu, S. K., Boadu, A., Saju, S., Nisbet, K., & Cummine, J.
Neuroscience. 587, 157–168. doi:10.1016/j.neuroscience.2025.09.035 sMRI Learn

2025 — **Examining the cerebral-cerebellar connectivity during spelling tasks**
Czobor, E., Striemer, C. L., Cheema, K., **Prem, P.**, Aalto, D., & Cummine, J.
The Cerebellum. 25, 5. doi:10.1007/s12311-025-01944-6 fMRI Language

Under Review or Revision

Note: Some submissions may not be available as preprints due to journal policies for anonymized peer-review.

2025 **Functional Brain Activation during Visual Statistical Learning is Related to Rapid Automatised Naming of Digits and Objects: an fMRI Study**
Prem, P., Boadu, A., Saju, S., Nisbet, K., & Cummine, J.
Scientific Studies of Reading (under revision). fMRI Learn Language

2025 **Better honest than sorry: State anxiety reduces dishonesty in low trait-anxious individuals**
Prem, P., Yogeeswaran, K., & Nash, K.
Cognition (under review). EEG Social Decision

2025 **Crossing Paths of Reading Processes and Statistical Learning in the Corticospinal Tract: Evidence from Diffusion Tensor Imaging**
Prem, P., Eze, P., Chew, R., Boadu, A., Saju, S., Nisbet, K., & Cummine, J.
Cortex (under review). DTI Learn Language

2025 **Neural Basis of Behavior Change in Choosing Stigmatized Foods**
Ellis, S. F., **Prem, P.**, Kecinski, M., Messer, K., Cummine, J., Nash, K., & Lusk, J.
Journal of Behavioral and Experimental Economics (submitted). fMRI Decision

2025 **Increased attention decreases the convincingness of belief-confirming evidence**
Simpson, D., **Prem, P.**, & Nash, K.
Journal of Experimental Social Psychology (resubmitted). Preprint doi:10.2139/ssrn.4671269 Decision

In Preparation

Anatomical Characterization of the Brainstem Subregions: A large-scale MRI Study
Prem, P., Aalto, D., Lulich, S.& Cummine, J.

Functional and structural neural differences following mindfulness treatment for Primary Biliary Cholangitis
Cummine, J., **Prem, P.**, Osness, E., Minckler, H., & Tandon, P.

Neural Correlates of Learning and Reading Fluency
Boadu, A., **Prem, P.**, Saju, S., Nisbet, K., & Cummine, J.

Functional Connectivity during Visual and Auditory Statistical Learning
Borle, C.[†], **Prem, P.**, Boadu, A., Saju, S., Nisbet, K., & Cummine, J.

The Relationship between Hemispheric Asymmetry of White Matter Pathways and Literacy Skills in Adults
Chew, R.[†], **Prem, P.**, Eze, P., Boadu, A., Saju, S., Nisbet, K., & Cummine, J.

Presentations

Talks

2024 June **Functional Brain Activation during Visual Statistical Learning is Related to Rapid Automatized Naming of Digits and Objects: an fMRI Study**
Prem, P., Boadu, A., Nisbet, K., Tan, N., Chan, A, & Cummine, J.
2024 Meeting of Canadian Society for Brain, Behavior and Cognitive Science, Edmonton, Canada [Talk]

2024 June **The Neural Correlates of Statistical Learning and Reading Fluency**
Boadu, A., **Prem, P.**, Tan, Eze, Chan, Nisbet, K., & Cummine, J.
2024 Meeting of Canadian Society for Brain, Behavior and Cognitive Science, Edmonton, Canada [Talk]

2020 Feb **Review: Predictive Factors of Delinquency in Children of Low Indian Socioeconomic Groups**
Prem, P.
2020 National Conference of Community Mental Health, Navi Mumbai, India [Talk]

2017 Dec **How to live for what you really need to live for**
Prem, P.
TEDxYouth @ DPS RK Puram 2017, New Delhi, India. [Talk]
ted.com/talks/praveen_prem_how_to_live_for_what_you_really_need_to_live_for

Posters

2025 Oct **Neural Basis of Behavior Change in Sustainable Food Choices**
Prem, P., Ellis, S. F., Kecinski, M., Nash, K., Messer, K., Lusk, J. & Cummine, J.
23rd Annual Meeting of Society for Neuroeconomics, Cambridge, USA [Poster]

2024 Oct **Experimentally Induced Anxiety Reduces Behavioural Dishonesty in Low-Trait Anxious**
Prem, P. & Nash, K.
22nd Annual Meeting of Society for Neuroeconomics, Cascais, Portugal [Poster]
2024 Meeting of Canadian Society for Brain, Behavior and Cognitive Science, Edmonton, Canada [Poster]
Available at ResearchGate: doi.org/10.13140/RG.2.2.31526.54082

2024 June **Towards Defining the Relationship Between Auditory and Visual Statistical Learning Performance and Cortical Thickness**
Saggu, S. K., Boadu, A., **Prem, P.**, Nisbet, K., & Cummine, J.
2024 Meeting of Canadian Society for Brain, Behavior and Cognitive Science, Edmonton, Canada [Poster]

Research Experience

July 2023 – **Cummine Neuroscience and Literacy Lab, University of Alberta**, Edmonton, Canada
Supervisor: Dr. Jacqueline Cummine

- Collected multimodal (anatomical, diffusion, functional) MRI data in a statistical learning project. Collected behavioral data on PsychoPy and E-Prime. Cleaned and processed behavioral response and time-series data using Python.
- Project: **Cortical and subcortical volume predictors of auditory versus visual statistical learning** sMRI
  - Analyzed T1-weighted images using using CAT12, Freesurfer and volBrain to extract volumetric data.
  - Hypothesis testing using a heirarchical model built and analyzed using R.
  - Lead authored first draft, revised and resubmitted manuscript during peer-review. Published in *Neuroscience*.
- Project: **Functional correlates of reading automacity and transitional probability learning** fMRI
  - Used whole-brain univariate approach with individual covariates of naming automacity to find functional correlates to linguistic and non-linguistic stimulus.
  - Designed fMRI analysis pipeline of preprocessing and first-level GLMs on SPM12. Built MATLAB scripts for automated analysis using parallel computing. Group-level analysis and inference mapping using AFNI
  - Presented as a talk at *CSBBCS* conference then lead-authored the manuscript under review at *Scientific Studies of Reading*.
- Project: **Neural basis of behavior change in sustainable food choices** fMRI Decision
  - Collaborative project with Dr. Kyle Nash and Dr. Sean F. Ellis (University of Pennsylvania) with main

contribution of fMRI analysis and writing.
  - Independently designed and conducted analysis pipelines on FSL. Built Shell scripts for automated analysis using parallel computing. Estimated several group-level models and conducted inference using Nilearn.
  - Presented as a poster at *SNE 2025* meeting. Co-lead-authored and submitted to *Journal of Economic Behavior and Organization*.
- Project: **Corticospinal tract as common white matter predictor of reading and learning** DTI
  - Assisted in DTI preprocessing and designing manual tractography pipelines for language white matter tracts.
  - Conducted moderation analysis of diffusion metrics to behavioral measures of reading on R.
  - Lead-authored the manuscript and submitted to *Cortex* (under review).
- Project: **Brainstem imaging and cranial nerve nuclei segmentation pipeline development** sMRI
  - Built manual tracing and segmentation pipeline on ITKSnap. Training graduate students to segment the Cn on a large dataset of T1-weighted images of brainstem.
  - Automated segmentation and preprocessing using freesurfer. Further developing an automated pipeline using deep learning models.

Dec 2022 – **Nash Social Neuroscience Lab, University of Alberta**, Edmonton, Canada
Supervisor: Dr. Kyle Nash

- Assisted in EEG data acquisition. Collected behavioral data using Inquisite and Qualtrics.
- Project: **Concrete thinking reduces confirmation bias to belief-confirm information** Decision
  - Secondary role in study design and hypothesis testing on a preregistered study. Co-lead-authored the manuscript submitted to *Journal of Experimental and Social Psychology*
- Project: **Neural trait markers of anxiety moderates state effect in reducing dishonesty** EEG Social
  - Learned and applied EEG method on pre-collected data. Extracted P300 difference ERP during auditory oddball task as neural marker of trait anxiety along with behavioral inhibition system as behavioral metric
  - Analyzed using conditional process modelling on R to test the moderating effect of trait anxiety on thread-induced reduction in dishonesty
  - Presented results as poster at *SNE 2024* meeting and lead-authored the manuscript for submission to *Cognition*

Technical Skills

- **Programming:** >_ Unix / Shell, Python, R, MATLAB (beginner)
- **Neuroimaging Analysis**: AFNI, SPM, FSL, FMRIPrep, nipype, nilearn, CONN, FreeSurfer, ExploreDTI, MRtrix, BrainVision Analyzer (EEG)
- **Behavioral Experiment:** Psychtoolbox, PsychoPy, E-Prime, Inquisit, Qualtrics
- **Other:** Adobe Illustrator/Inkscape, Adobe Photoshop, Markdown, LaTeX (overleaf)
- **Languages:** English, Hindi, French (A1), German (A1)

Workshops & Courses

- Introduction to Neuroeconomics (Higher School of Economics, Coursera)
- Econometrics: Methods and Application (Erasmus University Rotterdam, Coursera)
- Supervised Machine Learning (Stanford University, Coursera)

- SPM Course - fMRI & VBM (University College London)
- Principles of fMRI I (Johns Hopkins University, Coursera)
- swirl: Learn R (swirlstats)
- Python for Data Science (Codecademy)
- MATLAB Fundamentals (MATLAB Onramp)

Professional Development & Service

Academic Community Organizing

Since 2023 **Brain Imaging Journal Club**, **University of Alberta**, *Edmonton, Canada*
- Organized and led a reading group consisting of over 20 members including faculty, researcher, and students from several interdisciplinary neuroscience labs

Memberships

1. Society for NeuroEconomics (Since 2024)
2. Canadian Society for Brain, Behavior, and Cognitive Science (2024)

Teaching Experience & Mentorship

Guest Lecture

2026 (date TBD) **Task-based fMRI Analysis on SPM**
PSYCH 576: Cognitive Neuroscience (Winter 2026), **University of Alberta**

Mentorship

Master's Students

2024–2025 Sommer Mieklejohn (MSc SLP, UofA), *CSD 900: Directed Research Project*
2024–2025 Kirsten Kwong (MSc SLP, UofA), *CSD 900: Directed Research Project*
2024–2025 Judy Tran (MSc SLP, UofA), *CSD 900: Directed Research Project*

Undergraduate Students

2025 Winter Labiba Raisa (BA, UofA), *PSYCH 498: Individual Research*
2024–2025 Katelyn Ngo (BSc, UofA), *PHYSL 468/469: Undergraduate Research Thesis*
2024–2025 Rachael Chew (BSc, UofA), *PSYCH 398: Individual Study*
2024–2025 Dev Patel (BSc, UofA), *BIOL 498: Research Project, PSYCH 498*
2024–2025 Khushleen Dhindsa (BA, UofA), *PSYCH 390: Honors Thesis Research*
2024–2025 Hanna Farbin (BSc, UofA), *NEURO 452: Honors Thesis Research*
2024 Fall Mackenzie Caddy (BSc, UofA), *NEURO 451: Honors Research Project in Neuroscience*
2024 Fall Isaac Thiel (BSc, UofA), *NEURO 450: Honors Research Project in Neuroscience*
2024 Claire Borle (BSc, UofA), *NEURO 498/499: Honors Research Project in Neuroscience*

Clinical Experience

June – July 2021 **Aloha Lifestyle Reversal Clinic**, Pune, India
Clinical Psychotherapy Intern
- Assessment and history interview of patients of varying psychotic, depressive, and developmental spectrums. Developed treatment strategy and plan for select patients

July – Aug 2020 **Heera Psychological Testing, Research and Consultancy**, India
Clinical Psychology Research Intern
- Studied family health perception and its impact on quality of life in varying socioeconomies

June – July 2020 **Indian Association of Health, Research and Welfare**, India
Clinical Psychology Research Intern
- Examined in a survey how environmental optimism impacts well-being and climate action

July – Aug 2020 **PEACE Clinic**, New Delhi, India
Clinical Psychotherapy Intern
- Applied psychometric assessments and diagnostic exercises on 5 clinical cases. Developed and presented patient history and case reports.

Other Interests

- Martial Arts: Krav Maga, Kickboxing, Karate, Taekwondo
- Professional Photography (landscape, abstract), and Graphic Design

References

1. **Jacqueline Cummine** (Professor, Faculty of Rehabilitation Medicine, University of Alberta): jcummine@ualberta.ca
2. **Kyle Nash** (Associate Professor, Faculty of Arts, University of Alberta): knash@ualberta.ca
3. **Sean F. Ellis** (Director of Analytics, Behavior Change for Good Initiative, University of Pennsylvania): sfellis@wharton.upenn.edu
4. **Jeremy Caplan** (Professor, Faculty of Science, University of Alberta): jcaplan@ualberta.ca
5. **Daniel Aalto** (Associate Professor, Faculty of Rehabilitation Medicine, University of Alberta): aalto@ualberta.ca

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Find recent CV here.