

Henry Jones

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Research & Domain Experience

Research Coordinator

Stanford University

Poldrack Lab. Advisors: Russ Poldrack (PI), Patrick Bissett

Sep 2019 - Present

- Recruit and retain healthy normal participants as well as binge eaters and smokers for cross-sectional and longitudinal studies.
- Develop and maintain novel tasks for online and in-scanner deployment.
- Analyze high dimensional (fmri & behavioral) data using univariate and multivariate approaches.
- Generate open and reproducible analysis pipelines.

Undergraduate Research Assistant

Brown University

Badre Lab. Advisors: David Badre (PI), Avinash Vaidya

Feb 2017 - May 2019

- Directed a study investigating context and expected value representation in the prefrontal cortex.
- Recruited and ran participants over 10 pilot studies of the task, including fMRI sessions.
- Brown Undergraduate Teaching and Research Award recipient.
- Training new undergraduate RAs in lab protocols for participant interactions.

Head Teaching Assistant

Brown University

Advisor: Sara Lazar (PI)

Jan 2018 - May 2019

- Helped structure topics and lesson plans. Became proficient in the intersection of mindfulness and cognitive neuroscience theories and taught students with no background knowledge.
- Prompted students, organized class discussion, critiqued students written responses to the readings.
- Assisted students in refining presentations, organizing ideas and literature searches for final papers.

Education

Brown University

Providence, RI

Sc.B. Cognitive Neuroscience - 4.0 CGPA, Magna cum Laude

May 2019

Honors Thesis Context and Value Encoding in the Orbitofrontal Cortex: Investigating the Representational Geometry of the OFC

Relevant Advanced Coursework (*Audit)

- | | | |
|--|---|---|
| ○ Cognitive Control Functions of the Prefrontal Cortex | ○ Cognitive Neuroscience of Mindfulness | ○ Computational Cognitive Neuroscience |
| ○ Working Memory | ○ Cognitive Neuropsychology | ○ Computational Methods for Cognitive Science |
| ○ Neural Systems | ○ Language and the Brain | ○ Deep Learning |
| ○ Quantitative Methods in Psychology | ○ Child Language Acquisition | ○ Logic for Systems |
| ○ Neural Dynamics | ○ Research Methods and Design | |
| | ○ Theory and Practice of fMRI* | |

Projects

Building a Cognitive Ontology of Self Regulation

Poldrack Lab

Exploring Behavior & Neural Networks in Controls, Binge Eaters, and Smokers

Sep 2019 - Present

- Recruit and retain binge eaters and smokers for 2 scanning sessions along with a 1 month mobile app intervention and daily surveys.
- Re-analyze behavioral dependent variables using exploratory factor analysis and regularized regression to examine ontology robustness

- Collaborate on the analysis of fMRI data, including standard univariate analyses, linear encoding models, and PCA-based state analyses.
- Maintain and Convert behavioral tasks into scanner-ready tasks.
- Attain level-3 scanning certification.

Exploring Cognitive Control Networks through Precision Neuroscience

Poldrack Lab

Differentiating Cognitive Control Networks through Dense Scanning & Novel Dual-Tasks

Sep 2019 - Present

- Help maintain and develop novel cognitive control dual-tasks, and convert into scanner-ready versions.
- Recruit and retain participants for 12 sessions of scanning along with 1 behavioral baseline session.
- Assist with IRB modification and review processes.

Neurodesign: Generating Optimal fMRI task sequences

Poldrack Lab

Generating Optimal fMRI Task Sequences through Evolutionary Algorithms

Nov 2019 - Present

- Build reproducible conda environments and Docker images for continued programmatic use of Neurodesign.
- Implement optseq2 metrics in python for direct comparison of packages.
- Create hyperparameter optimization for tasks with different numbers of stimuli and event-probabilities.

Investigating Violations of Context Dependence in Stop Signal Tasks

Poldrack Lab

Examining Context Violations in 25 Conditions across 14 Datasets

Mar 2020 - Jun 2020

- Build a reproducible pipeline in python for generating statistical results and figures.
- Implement Bayes factor analyses and Linear Mixed Effects models.

Response Inhibition in Shared Control Settings

Poldrack Lab

Examining Error Patterns with Varying Degrees of Artificial Assistance

Feb 2020 - Present

- Build a novel inhibition task using pressure-sensitive keyboard in Python.
- Assist in the task design and analyses plan for investigating error patterns.

Representation of Value and Latent Task States in the Brain

Badre Lab

Separating Value and State Representation through Novel and Traditional Control Tasks

Feb 2021 - Present

- Assist in the design of a novel task orthogonalizing item values and task space.
- Recruit participants and run 10 pilot behavioral studies to maximize the understanding of the task on first presentation.
- Run pilot scan study. Assist in the implementation of Representational Similarity Analysis on regions of interest to compare task and value representation
- Translate the task from Matlab to Javascript for online deployment in a battery of control tasks.

Publications

Bissett, P., **Jones, H.**, Poldrack, R., & Logan, G. (2020). Severe and pervasive violations of independence in response inhibition tasks. *PsyArXiv*. doi:10.31234/osf.io/kpa65

Vaidya, A., **Jones, H.**, Castillo, N., & Badre, D. (in prep.). Neural representations of latent task states during generalization.

Posters

Jones, H., Vaidya, A., & Badre, D. (2018). Testing for context and value in the brain. Presented at the Brown University Undergraduate Teaching & Research Awards Summer Symposium.

*Vaidya, A., **Jones, H.**, Castillo, N., & Badre, D. (2019). Testing neural representations of value and task space. Presented at the 49th annual meeting of the Society for Neuroscience.

*Not self-presented.

Skills

Programming Python, JavaScript, Shell, High-Performance Cluster Computing, git & GitHub, conda environments, Docker & Singularity Images, jsPsych, Experiment Factory, Emergent, Matlab, Psychtoolbox.

High-dimensional Data Analysis Regularized Regression models, Principal Components Analysis, Cross-Validation and Permutation Testing, Exploratory Factor Analysis, Linear Mixed-Effects Modeling, Representational Similarity Analysis, Support Vector Machines, Deep Learning, Multi-Voxel Pattern Analysis.

fMRI Analysis Nistats & Nilearn, MRIQC, fMRIPrep, FSL, SPM.

Familiarity With Drift Diffusion Modeling, Independent Component Analysis, Neural Mass Modeling, Hierarchical Bayesian Modeling, Graphical Modeling & Inference Techniques.

General Recruitment, Task Design and Deployment, Open Science Methods, Collaboration.

Coordination & Work Experience

Co-coordinator

Providence, RI

Cognitive Neuroscience Department Undergraduate Group

May 2018 - May 2019

- Secure funding, coordinate pre-professional/supportive events for students studying Cognitive Neuroscience.

Safe Walk

Providence, RI

Brown University

Oct 2016 - May 2018

- Walk students across campus to prevent theft and assault, provide sense of security and conversational partner.

Senior Counselor

Fremont, MI

McGaw YMCA Camp Echo

May 2016 - Aug 2016

- Created and lead activities and biking routes. Assisted in teaching of bike maintenance for advanced campers.
- Developed camp-wide competition to facilitate inter-group friendships.
- Assisted swim lessons, helping to attenuate fears and engender confidence in those learning.

Tournament Co-director

Providence, RI

Brownian Motion - Brown Club Frisbee A-team

July 2016 - Oct 2016

- Invited, organized 32 teams attending the tournament from across the Northeast.
- Arranged field space, tournament sponsors, merchandise, injury trainers, brackets, event security, and food.

Counselor

Camp Kanuga, NC

Camp Kanuga Junior Youth Program (JYP)

May 2016 - Aug 2016

- Guided cabin of middle school students (rising 7th-9th grade) in daily activities.
- Created activities, skits and songs to entertain and educate campers. Lead hikes in surrounding areas.

Counselor

Haw River State Park, NC

HUGS Camp

Jul 2015

- Lead campers requiring a range of assistance including those with autism spectrum disorder, down syndrome, and childhood epilepsy syndromes.
- Worked with helper campers to maximize the camp experience for the campers. Helped campers sleep, swim, create arts and crafts, dance, and play games.
- Adjusted activities or assistance dynamically to encourage campers to push themselves and have fun while making sure that every activity was safe and not overwhelming for any individual.

Interests, Hobbies, etc.

Interests Animation, Auditory Design (Music, Sound Design, Sound Art), Nature, Television & Film, Machine Learning & AI, Internet Culture, Spatial Intuitions of Math & Problem Solving, Science Fiction, Accessible Design, Pattern Recognition & Abstraction, Smartphones.

Hobbies Gardening, Dancing, Short Story Writing, Music Making, Bike Touring, Camping, Climbing.