Jacob A. Parker, B.Sc.

Ph.D. Candidate in Neuroscience
Neuroscience Graduate Group
University of Pennsylvania

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Education

2021–Present **Ph.D. in Neuroscience [in progress]**
University of Pennsylvania
Thesis Advisors: Joshua I. Gold & Joseph W. Kable

2013-2017 **B.Sc. in Neural Science**
New York University
Honors: Magna Cum Laude

Positions

2017-2021 **Post-Baccalaureate Research Fellow**
Human Motor Control Section
National Institute of Neurological Disorders and Stroke
Principal Investigator: Mark Hallett

2015-2017 **Undergraduate Research Assistant**
Carrasco Lab
New York University
Supervisors: Rachel Denison & Marisa Carrasco

Honors & Awards

2023-2026 NSF Graduate Research Fellowship
2017-2020 NIH Intramural Research Training Award
2017 NIH Summer Internship Program
2017 University Honors Scholar, NYU
2014-2017 Dean's List, NYU
2014-2016 CSCAA Honorable Mention Scholar All American (academic + athletic excellence)
2014-2016 University Athletic Association All Academic Recognition
2013-2016 NYU Intercollegiate Athletics Advisory Committee's Honor Roll

Publications

[7] **Jacob A. Parker**, Kristen Li, Alexandre L. S. Filipowicz, Vijay Balasubramanian, Joseph W. Kable, Joshua I. Gold. Suboptimal human decision-making reflects an efficient information bottleneck on inference. *[In preparation].*

[6] Primavera A. Spagnolo, **Jacob A. Parker**, Mark Hallett, Silvina G. Horovitz. Functional Movement Disorder Is Associated with Abnormal Interoceptive Brain Activity: A Task-Based Functional MRI Study. *Frontiers in Psychiatry* **16** (2025).

[5] Rebecca E. Waugh, **Jacob A. Parker**, Mark Hallett, Silvina G. Horovitz. Classification of Functional Movement Disorders with Resting-State Functional Magnetic Resonance Imaging. *Brain Connectivity* **13,** 4–14 (2023).

[4] **Jacob A. Parker**, Shabbir H. Merchant, Sanaz Attaripour-Isfahani, Hyun Joo Cho, Patrick McGurrin, Brian P. Brooks, Albert R. La Spada, Mark Hallett, Laryssa A. Huryn, Silvina G. Horovitz. In Vivo Assessment of Neurodegeneration in Spinocerebellar Ataxia Type 7. *NeuroImage: Clinical* **29,** 102561 (2021).

[3] Primavera A. Spagnolo, **Jacob Parker**, Silvina Horovitz, Mark Hallett. Corticolimbic Modulation via Intermittent Theta Burst Stimulation as a Novel Treatment for Functional Movement Disorder: A Proof-of-Concept Study. *Brain Sciences* **11,** 791 (6 2021).

[2] Shabbir Hussain I. Merchant, Eleni Frangos, **Jacob Parker**, Megan Bradson, Tianxia Wu, Felipe Vial-Undurraga, Giorgio Leodori, M. C. Bushnell, Silvina G. Horovitz, Mark Hallett, Traian Popa. The Role of the Inferior Parietal Lobule in Writer's Cramp. *Brain* **143,** 1766–1779 (2020).

[1] Rachel N. Denison*, Jacob A. Parker*, Marisa Carrasco. Modeling Pupil Responses to Rapid Sequential Events. *Behavior Research Methods* (2020). *equal contribution.

Conference Presentations

[14] M. C. Tandoc, S. H. Solomon, A. B. Williams, A. Gordienko, **J. A. Parker**, A. C. Schapiro. *Category learning drives neural repulsion initially but integration at a delay.* Cognitive Neuroscience Society Annual Meeting. Boston, MA, USA, 2025. [Poster].

[13] **J. A. Parker**, A. Filipowicz, V. Balasubramanian, J. W. Kable, J. I. Gold. *Suboptimal human decision-making can reflect an efficient information bottleneck.* Society for Industrial and Applied Mathematics Conference on the Life Sciences. Portland, OR, USA, 2024. [**Invited Talk**].

[12] M. C. Tandoc, S. H. Solomon, **J. A. Parker**, A. Gordienko, A. C. Schapiro. *The representation and retrieval of general versus specific category knowledge.* Cognitive Neuroscience Society Annual Meeting. Toronto, Canada, 2024. [Poster].

[11] **J. A. Parker**, A. Filipowicz, V. Balasubramanian, J. W. Kable, J. I. Gold. *Suboptimal human decision-making can reflect an efficient information bottleneck.* Society for Neuroscience Annual Meeting. Washington, DC, USA, 2023. [Poster].

[10] S. G. Horovitz, **J. A. Parker**, P. Bedard, C. Maurer, M Hallett. *Structural alterations in functional movement disorders: a diffusion weighted imaging study.* 28th Annual Meeting of the International Society for Magnetic Resonance in Medicine. Virtual, 2020. [Poster].

[9] **J. A. Parker**, Shabbir H. Merchant, Sanaz Attaripour-Isfahani, Patrick McGurrin, Laryssa A. Huryn, Mark Hallett, Silvina G. Horovitz. *Structural Magnetic Resonance Imaging Correlates of Neurodegeneration in a Spinocerebellar Ataxia Type 7 Cohort.* Society for Neuroscience Annual Meeting. Chicago, IL, USA, 2019. [Poster].

[8] S. H. Merchant, E. Frangos, S. G. Horovitz, T. Popa, **J. A. Parker**, M. Hallett. *Interactions within Fine Motor Control Network in Task-specific Dystonia.* International Congress of Parkinson's Disease and Movement Disorders. Nice, France, 2019. [Poster].

[7] R. N. Denison, **J. A. Parker**, M. Carrasco. *Estimation of pupillary responses to rapid events.* 9th Annual Meeting of the Vision Sciences Society. St. Pete Beach, FL, USA, 2019. [Poster].

[6] **J. A. Parker**, S. H. Merchant, S. Attaripour-Isfahani, P. McGurrin, L. A. Huryn, M. Hallett, S. G. Horovitz. *Structural Magnetic Resonance Imaging Correlates of Neurodegeneration in a Spinocerebellar Ataxia Type 7 Cohort.* American Academy of Neurology Annual Meeting. Philadelphia, PA, USA, 2019. [Poster].

[5] S. Attaripour-Isfahani, P. McGurrin, **J. A. Parker**, N. Dang, F. Vial, M. Hallett. *Deciding and Instructed to go and no-go.* Second International Conference on Neuroscience and Free Will. Orange, CA, USA, 2019. [Poster].

[4] **J. A. Parker**, S. H. Merchant, S. Attaripour-Isfahani, P. McGurrin, M. Hallett, S. G. Horovitz. *Pathophysiologic insights into Spinocerebellar Ataxia Type 7 through Structural Imaging Analysis.* Society for Neuroscience Annual Meeting. San Diego, CA, USA, 2018. [Poster].

[3] **J. A. Parker**, S. H. Merchant, S. Attaripour-Isfahani, P. McGurrin, M. Hallett, S. G. Horovitz. *Pathophysiologic insights into ataxia and spasticity through structural imaging of a Spinocerebellar Ataxia Type 7 cohort.* International Congress of Parkinson's Disease and Movement Disorders. Hong Kong, China, 2018. [Poster].

[2] R. N. Denison, **J. A. Parker**, M. Carrasco. *Pupil dilation reveals the timecourse of voluntary temporal attention.* 40th European Conference on Visual Perception. Berlin, Germany, 2017. [Poster].

[1] **J. A. Parker**, R. N. Denison, M. Carrasco. *Pupil Size as an Index of Voluntary Temporal Attention.* 43rd Undergraduate Research Conference of the New York University College of Arts and Science. New York, NY, USA, 2017. **[Talk]**.

Mentorship

2024-Present **Leo Li**, Masters Student

2023-Present **Kristen Li**, Undergraduate Independent Study
Honors Thesis: A study on information-efficient inference in human decision-making
Received the Rose Undergraduate Research Award (only 10 undergrads awarded per year)

Teaching

Spring 2024 **Teaching Assistant**, Theoretical and Computational Neuroscience
University of Pennsylvania

Service

2021-Present **General Member**, Graduate Led Initiatives and Activities (GLIA), UPenn

2022-2024 **Co-Chair**, Penn Neuroscience Public Lecture Series
Organized semi-annual lectures attended by 100+ people with annual budget of $7000.

2021-2022 **Committee Member**, Penn Neuroscience Public Lecture Series

2019-2020 **Co-Chair**, NIH Postbac Seminar Series

2019-2020 **Volunteer Tutor**, STEM in Your Hood, College Bound DC

2018-2020 **Committee Member**, NIH Postbac Committee

2018-2020 **Patient Care Assistant**, Suburban Hospital (Bethesda, MD)

2018-2019 **Committee Member**, NIH Postbac Seminar Series

2016-2017 **Patient Care Volunteer**, New York Presbyterian-Brooklyn Methodist Hospital

Software Tools

Pupil Response Estimation Toolbox
Website: https://github.com/jacobaparker/PRET
Publication: https://pubmed.ncbi.nlm.nih.gov/32144729/

Additional Experience

2023-2024 **Writer**, PennNeuroKnow, UPenn GLIA
Authored 4 original articles about neuroscience for a non-scientific audience.

Fall 2023 **Team Member - Healthcare Consulting Project**, Penn Biotech Group
Built an AI-based system (GPT4) to extract structured data directly from the raw text of primary research articles for a biotech company specializing in cellular therapies.
Received Best Team Member Award

2022 **Team Member - Memo Writing Group**, Penn Science Policy and Diplomacy Group
Co-authored a science policy memo detailing how social media algorithms facilitate the spread of disinformation and potential policy options to address the issue.
Met with state and federal legislators to present and discuss content of memo.

Additional Writings

[5] **Jacob A. Parker**. *Decide Quickly or Decide Accurately- How Your Brain Solves a Classic Decision-Making Problem.* PennNeuroKnow. (2024).

[4] **Jacob A. Parker**. *The Experiments That Opened the Brain's Black Box.* PennNeuroKnow. (2024).

[3] **Jacob A. Parker**. *Why Forgetting Might Actually Be a Good Thing.* PennNeuroKnow. (2024).

[2] **Jacob A. Parker**. *ChatGPT versus the Brain: A Nerve-Wracking Matchup.* PennNeuroKnow. (2023).

[1] Walker Gosrich, **Jacob A. Parker**, Hersh Sangvhi, Tuhina Srivastava, Shannon L. Wolfman. *Neutralizing the Algorithm: Approaches for Reducing the Spread of Disinformation Online.* SciTech Forefront. (2022).