Jonathan Nicholas, Ph.D.

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Employment History

Sept. 2027	**Group Leader (incoming)** Paris Brain Institute, Center for Artificial Intelligence and Data Science
2023 – present	**Postdoctoral Researcher** New York University, Advisor: Marcelo Mattar
2015 – 2017	**Research Software Developer** Stanford Cognitive and Systems Neuroscience Lab

Education

2017 – 2023	**Ph.D., Columbia University**, Psychology (Cognitive Neuroscience) Advisor: Daphna Shohamy
2011 – 2015	**B.Sc. with Honors, Brown University**, Cognitive Neuroscience

Grants and Fellowships

2025-2027	NSF SBE Postdoctoral Research Fellowship, $160,000 "Exploring the role of episodic memory in adaptive decision making"
2021-2022	Leo Rubinstein Endowed Fellowship
2017-2020	NSF Graduate Research Fellowship

Honors and Awards

2024	Best Talk Award, Society for Neuroeconomics
	Postdoctoral Travel Award, New York University
2022	Edward E. Smith Memorial Award in Cognitive Neuroscience, Columbia University
2015	Kling Premium in Psychology, Brown University
2014	Karen T. Romer Undergraduate Teaching and Research Award, Brown University
	1st Prize, Brown Institute for Brain Sciences Neural Decoding Competition

Research

Preprints

1. **Nicholas, J.**, Chen, S., and Mattar, M.G., *Flexible decisions arise from resource-rational memory sampling*, 2026. DOI: 10.64898/2026.06.15.732446.

Journal Articles

1. **Nicholas, J.** and Mattar, M.G., "Episodic memory facilitates flexible decision making via access to detailed events," *Nature Human Behaviour*, 2026. DOI: 10.1101/2025.03.13.643066.
2. Lichtman, D., Bergmann, E., **Nicholas, J.**, Gerraty, R.T., and Kahn, I., "The periaqueductal gray selectively supports reversal learning during a flexible discrimination task in mice," *eLife*, 2026. DOI: 10.64898/2026.01.19.700312.

3. **Nicholas, J.**, Daw, N.D., and Shohamy, D., "Proactive and reactive construction of memory-based preferences," *Nature Communications*, 2025. DOI: 10.1038/s41467-025-56183-4.

4. Montaser-Kouhsari, L.*, **Nicholas, J.***, Gerraty, R.T., and Shohamy, D., "Differentiating reinforcement learning and episodic memory in value-based decisions in parkinson's disease," *Journal of Neuroscience*, 2025, ***Denotes co-first author**. DOI: 10.1523/JNEUROSCI.0911-24.2025.

5. **Nicholas, J.**, Amlang, C.J., Lin, C.Y., Desai, N., Montaser-Kouhsari, L., Kuo, S.H., and Shohamy, D., "The role of the cerebellum in learning to predict reward: Evidence from cerebellar ataxia," *The Cerebellum*, 2024. DOI: 10.1007/s12311-023-01633-2.

6. Luo, X., Rechard, A., Sun, G., N. Yanez, F., Yilmaz, B., Lee, K., Cohen, A.O, Borghesani, V., Pashkov, A., Marinazzo, D., **Nicholas, J.**, …, and Love, B.C., "Large language models surpass human experts in predicting neuroscience results," *Nature Human Behaviour*, 2024. DOI: 10.1038/s41562-024-02046-9.

7. **Nicholas, J.**, Daw, N.D., and Shohamy, D., "Uncertainty alters the balance between incremental learning and episodic memory," *eLife*, 2022. DOI: 10.7554/eLife.81679.

8. Grossman, I., Rotella, A., Hutcherson, C.A., …, **Nicholas, J.**, …, and Wilkening, T., "Insights into accuracy of social scientists' forecasts of societal change," *Nature Human Behaviour*, 2022. DOI: 10.1038/s41562-022-01517-1.

9. Chen, L., Iuculano, T., Mistry, P., **Nicholas, J.**, Zhang, Y., and Menon, V., "Linear and nonlinear profiles of weak behavioral and neural differentiation between numerical operations in children with math learning difficulties," *Neuropsychologia*, 2021. DOI: 10.1016/j.neuropsychologia.2021.107977.

10. Iuculano, T., Padmanabhan, A., Chen, L., **Nicholas, J.**, Mitsven, S., de los Angeles, C., and Menon, V., "Neural correlates of cognitive variability in childhood autism and relation to heterogeneity in decision-making dynamics," *Developmental Cognitive Neuroscience*, 2020. DOI: 10.1016/j.dcn.2020.100754.

11. Dimsdale-Zucker, H.* and **Nicholas, J.***, "Is spatial context privileged in the neural representation of events?" *Journal of Neuroscience*, 2018, ***Denotes co-first author**. DOI: 10.1523/JNEUROSCI.0949-18.2018.

12. Taghia, J., Cai, W., Ryali, S., Kochalka, J., **Nicholas, J.**, Chen, T., and Menon, V., "Uncovering hidden brain state dynamics that regulate performance and decision-making during cognition," *Nature Communications*, 2018. DOI: 10.1038/s41467-018-04723-6.

13. Ryali, S., Supekar, K., Chen, T., Kochalka, J., Cai, W., **Nicholas, J.**, Padmanabhan, A., and Menon, V., "Temporal dynamics and developmental maturation of salience, default and central-executive network interactions revealed by variational bayes hidden markov modeling," *PLOS Computational Biology*, 2016. DOI: 10.1371/journal.pcbi.1005138.

Conference Proceedings

1. **Nicholas, J.** and Mattar, M.G., "Humans use episodic memory to access features of past experience for flexible decision making," in *46th Proceedings of the Annual Meeting of the Cognitive Science Society*, Rotterdam, The Netherlands, 2024. URL: https://escholarship.org/uc/item/9x22d800.

Presentations

Invited and Contributed Talks

2026 **Paris Brain Institute Center for Artificial Intelligence**, Paris, France

9th Annual Conference on Cognitive Computational Neuroscience, New York, NY

Manhattan Area Memory Meeting, New York, NY

Presentations (continued)

Manhattan Area Learning Meeting, New York, NY

2025 **The University of Texas at Austin Department of Psychology**, Austin, TX

UCL Max Planck Computational Psychiatry Seminar Series, Virtual

Johns Hopkins Ocular Motor & Vestibular Lecture Series, Virtual

2024 **Annual Meeting of the Cognitive Science Society**, Rotterdam, Netherlands

Society for Neuroscience, Chicago, IL

Society for Neuroeconomics, Cascais, Portugal

2022 **5th Multidisciplinary Conference on Reinforcement Learning and Decision Making**, Providence, RI

Society for Neuroeconomics, Arlington, VA

2019 **Columbia Interdisciplinary Decision Making Meeting**, New York, NY

Manhattan Area Memory Meeting, Princeton, NJ

Posters

2026 **9th Annual Conference on Cognitive Computational Neuroscience**, New York, NY. Selected as poster spotlight (top 10% of submissions)

Annual Meeting of the Cognitive Science Society, Rio De Janeiro, Brazil

2025 **6th Multidisciplinary Conference on Reinforcement Learning and Decision Making**, Dublin, Ireland

2024 **Cognitive Computational Neuroscience**, Boston, MA

2022 **Society for Neuroscience**, San Diego, CA

Neurobiology of Reward and Decision Making, Lake Arrowhead, CA

18th Annual Context and Episodic Memory Symposium, Philadelphia, PA

International Congress of Parkinson's Disease and Movement Disorders, Madrid, Spain

International Congress for Ataxia Research, Dallas, TX

2019 **Society for Neuroscience**, Chicago, IL

Cognitive Neuroscience Society, San Francisco, CA

2016 **Fourth Annual Flux Congress**, St. Louis, MO

2014 **Brown Summer Research Symposium**, Providence, RI

Academic Service

Organizing

2025 **Application Support Mentor**, NYU Application Support Group

2025-2026 **Organizer**, NYU ConCats Seminar Series

2024-2025 **Organizer**, NYU ConCats Seminar Series

2022 **Research Mentor**, Columbia Summer Internship Program in Psychological Science

2020-2021 **Instructor**, Columbia University Introduction to Programming Bootcamp

2020 **Organizer**, Columbia Interdisciplinary Decision Making Meeting

Scientific Computing Support Staff, Columbia Psychology Department

2019 **Organizer**, Columbia University Introduction to Programming Bootcamp

Academic Service (continued)

Organizer, Manhattan Area Memory Meeting

Teaching

2022 **Teaching Fellow**, Science of Psychology, Columbia University
Teaching Fellow, Cognitive Neuroscience, Columbia University
2020 **Teaching Fellow**, Statistics for Behavioral Scientists, Columbia University
2019 **Teaching Fellow**, Cognitive Neuroscience, Columbia University
2018 **Teaching Fellow**, Experimental Methods, Columbia University
2017 **Teaching Fellow**, Behavioral Neuroscience, Columbia University
2015 **Teaching Assistant**, Computational Cognitive Science, Brown University

Mentoring

Undergraduate Honors Theses

2019-2020 Nicole van Amerongen
2018-2020 Jessica Hecht

Undergraduate Research Assistants

2025-2026 Dariush Nashat
2023-2025 Yifei Deng
2022 Annie Xu
Sukriti Gupta
2020 Jesse Eiseman
2019 Natasha King

High School Research Assistants

2022 Andy Feng
Hitomi Nakamura
2021-2022 Pradnya Rajalakshmi
2021 Loc Nguyen
Brad Ji

Peer Review

Nature Communications, eLife, PLOS Computational Biology, Communications Psychology, Journal of Experimental Psychology: General, Cognitive Science, Memory and Cognition, Scientific Reports, Frontiers in Neuroscience, PLOS One

Technical Skills

Research Methods

Task design, Bayesian modeling, Reinforcement learning, Eyetracking, fMRI, MEG

Technical Skills (continued)

Programming Languages

Proficient: Python, Matlab, Javascript

Competent: Stan, R, Unity/C, Bash, HTML/CSS