Laila C. Johnston

λ lailacj.github.io π laila_johnston@brown.edu ϕ google scholar μ

Education

2023 – present **Ph.D. Student, Cognitive Science**
Brown University, Providence, RI, USA

2018 – 2023 **B.S. in Mathematics, Minor in Computer Science, Minor in Philosophy**
University of Central Florida, Orlando, FL, USA

Research Interests

computational cognitive science ~ probabilistic programming ~ compositional concepts ~ concept learning ~ probabilistic language of thought ~ relationship between conceptual representation, language, and thought ~ language models ~ question asking ~ learning from explanation ~ the frame problem ~ ad-hoc alternatives

Research Experience

2023 – present **Graduate Student**, *Language and Thought Lab*, Brown University, Providence, RI
Advisor: Prof. Roman Feiman

2023 – present **Graduate Student**, *LUNAR Lab*, Brown University, Providence, RI
Advisor: Prof. Ellie Pavlick

2021 – 2023 ***CoCoSci Group***, Massachusetts Institute of Technology, Cambridge, MA
Undergraduate Researcher (Sep. 2022 – May 2023)
Research Fellow, MSRP Bio/Neuro (Summer 2022)
Visiting Student (Aug. 2021 – Dec. 2021)
Advisor: Prof. Joshua B. Tenenbaum

Summer 2021 **Research Fellow**, MSRP Bio/Neuro, Center for Brains, Minds, and Machines, *Computational Cognitive Neuroscience Lab*, Harvard University, Cambridge, MA
Advisor: Prof. Samuel J. Gershman

2020 – 2021 Carnegie Mellon University, *Center for the Neural Basis of Cognition*, Pittsburgh, PA
Undergraduate Researcher (Sep. 2020 – Feb. 2021)
Research Fellow, Undergraduate Program in Neural Computation (Summer 2020)
Advisor: Prof. David Danks

Awards and Honors

2023 **National Science Foundation Graduate Research Fellowship**
Summer 2022 **Massachusetts Institute of Technology Summer Research Fellow** (NSF Funded)
Summer 2022 **McNair Summer Research Institute Scholarship**
Feb. 2022 **Mathematics of Collective Intelligence Workshop Travel Scholarship**, IPAM, UCLA
Fall 2021 **Visiting Student Fellowship**, Department of Brain and Cognitive Sciences, MIT
2018 – 2021 **Dean's List** (5 Semesters), University of Central Florida
2021 **Hispanic Heritage Scholarship Fund of Metro Orlando Scholar**
Summer 2021 **Massachusetts Institute of Technology Summer Research Fellow** (NSF Funded)
Summer 2021 **McNair Summer Research Institute Scholarship**
2020 **Ronald E. McNair Scholar**
2020 **Carolyn Euliano Endowed Scholarship in Mathematics**, University of Central Florida

Summer 2020	**Carnegie Mellon University Summer Research Fellow** (NIH Funded)
2018	**EXCEL Scholar**, University of Central Florida
2018	**Pegasus Scholar**, University of Central Florida
2018	**Florida's Bright Futures Academic Scholar**
2018	**International Baccalaureate Diploma Recipient**

Publications

Johnston, L.*, Hillman, N.*, Danks, D. (2021). Individual Differences in Causal Learning. ***Proceedings of the 43rd Annual Conference of the Cognitive Science Society.***

** co-author*

Conferences

Johnston, L. [Δ], Smits, D. A., Pavlivk, E., Feiman, R. (2024, June). The Structure of Ad-Hoc Alternatives. ***Experiments in Linguistic Meaning.*** Poster presentation.

Johnston, L.C. [Δ], Siegel, M.H., Tenenbaum, J.B., Gerstenberg, T. (2022, October). Reasoning with Compositional Concepts in the Probabilistic Language of Thought. ***SACNAS NDiSTEM Research Conference.*** Poster presentation.

Johnston, L.C. [Δ], Siegel, M.H., Tenenbaum, J.B., Gerstenberg, T. (2022, August). Reasoning with Compositional Concepts in the Probabilistic Language of Thought. ***Center for Brains, Minds, and Machines Summer Research Poster Session.*** Poster presentation.

Johnston, L.C. [Δ], Siegel, M.H., Tenenbaum, J.B., Gerstenberg, T. (2021, September). Reasoning with Compositional Concepts. ***MKN McNair Heartland Research Conference.*** Oral presentation (15 minutes).

Johnston, L.C. [Δ], Bates, C.J., Egger, B., Gershman, S.J. (2021, August). Scaling Models of Visual Working Memory to Natural Images: A Case Study in Human Faces. ***Center for Brains, Minds, and Machines Summer Research Poster Session.*** Poster presentation.

Johnston, L. [Δ], Hillman, N., Danks, D. (2021, March). Individual Differences in Causal Learning. ***UCF Student Scholar Symposium.*** Poster presentation.

Johnston, L. [Δ], Hillman, N. [Δ], Danks, D. (2020, August). Individual Variation in Causal Learning. ***Center for the Neural Basis of Cognition Undergraduate Summer Research Showcase.*** Poster presentation. Video presentation.

[Δ] *presenter*

Leadership

2020 – 2023	***Artificial Intelligence Club (AI@UCF)***, University of Central Florida, Orlando, FL **Discussions Director** (April 2022 – April 2023) **Vice President** (April 2021 – April 2022) **Coordinator** (Feb. 2021 – April 2021)
2020 – 2022	***Cognitive Sciences Club***, University of Central Florida, Orlando, FL **President** (Dec. 2020 – April 2022) **Secretary** (July 2020 – Dec. 2020)
2019 – 2020	**Secretary**, ***Collegiate Mathematical Society***, University of Central Florida, Orlando, FL

Teaching

Jan. 2022 **Teaching Assistant & Mentor**, *Quantitative Methods Workshop*, Massachusetts Institute of Technology, Cambridge, MA
Supervisor: Dr. Mandana Sassanfar

Spring 2020 **Undergraduate *EXCEL* Tutor**, University of Central Florida, Orlando, FL
Supervisor: Sarah Evans

Research Paper Discussions

Oct. 2022 **Human Level Concept Learning Through Probabilistic Program Induction (Lake et al. 2015)**; *Led a paper discussion to 15 students at AI@UCF Discussions Meeting (90 minutes)*

Sep. 2022 **Building Machines That Learn and Think Like People (Lake et al. 2016)**; *Led a paper discussion to 30 students at AI@UCF Discussions Meeting (90 minutes)*

Feb. 2022 **Concepts in a Probabilistic Language of Thought (Goodman et al. 2015)**; *Led a paper discussion to 15 students at AI@UCF Discussions Meeting (90 minutes)*

Invited Talks

Oct. 2022 **How to Get Involved in Undergraduate Research**; *AI@UCF & Cognitive Sciences Club at UCF (60-minute talk)*

April 2022 **Collective Intelligence: Emergence, Swarms, and Cooperation**; *Cognitive Sciences Club at UCF (60-minute talk)*

March 2022 **Reasoning with Compositional Concepts**; *CoCoSci Lab Meeting at MIT (90-minute talk, ~35 person audience)*

Feb. 2022 **Representing Human Thought and Reasoning with Probabilistic Programs**; *Cognitive Sciences Club at UCF & AI@UCF (60-minute talk)*

Feb. 2022 **Concepts: Representational Structure, Learning, and Reasoning**; *Cognitive Sciences Club at UCF (60-minute talk)*

Invited Panels

Oct. 2021 **Undergraduate Research Student Panelist**, *The Undergraduate Research Committee*, San Diego State University, San Diego, CA

Oct. 2020 **Summer Research Student Panelist**, *The Office of Academic Advancement Programs*, University of Central Florida, Orlando, FL

Workshops

Oct. 2022 **Attendee**, *Brown University Graduate Programs Diversity Preview*, Brown University, Providence, RI

Feb. 2022 **Attendee**, *Mathematics of Collective Intelligence Workshop*, Institute for Pure and Applied Mathematics, University of California Los Angeles, Los Angeles, CA

Oct. 2021 **Attendee**, *Princeton Prospective Ph.D. Preview (P3) Conference*, Princeton University, Princeton, NJ

Jan. 2021 **Attendee**, *Quantitative Methods Workshop*, Massachusetts Institute of Technology, Cambridge, MA
Director: Dr. Mandana Sassanfar

Skills

Programming	PYTHON, R, WEBPPL

Relevant Undergraduate Coursework

Mathematics	Calculus I – III, Ordinary Differential Equations, Logic and Proof in Mathematics, Matrix Algebra, Linear Algebra, Probability, Mathematical Modeling, Introduction to Graph Theory, Mathematical Foundations of Machine Learning and Artificial Intelligence, Real Analysis, Abstract Algebra, Introduction to Topology
Comp Sci	Computer Science I, Object Oriented Programming, Computer Science II (Algorithms)
Other	Physics I, Physics II, Formal Logic I, Philosophy of Love, Philosophy of Mind, Philosophy of Science, Minds and Machines: Philosophy of Cognitive Science, Metaphysics