

# Laila C. Johnston

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## 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 ~  
program induction ~ question asking ~ learning from explanation

## 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 – present **CoCoSci Group**, Massachusetts Institute of Technology, Cambridge, MA  
**Graduate Researcher (Sep. 2023 – present)**  
**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
- 2019 – 2020 **Undergraduate Research Assistant**, *Laboratory for Autonomy-Brain Exchange (LabX)*, University of Central Florida, Orlando, FL  
Advisor: Prof. Ben D. Sawyer

## 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**
- 2022 **Astronaut Scholar Nominee**, University of Central Florida
- 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

<b>2021</b>	<b>Hispanic Heritage Scholarship Fund of Metro Orlando Scholar</b>
Summer 2021	<b>Massachusetts Institute of Technology Summer Research Fellow (NSF Funded)</b>
Summer 2021	<b>McNair Summer Research Institute Scholarship</b>
<b>2020</b>	<b>Ronald E. McNair Scholar</b>
2020	<b>Carolyn Euliano Endowed Scholarship in Mathematics, University of Central Florida</b>
Summer 2020	<b>Carnegie Mellon University Summer Research Fellow (NIH Funded)</b>
2018	<b>EXCEL Scholar, University of Central Florida</b>
2018	<b>Pegasus Scholar, University of Central Florida</b>
2018	<b>Florida's Bright Futures Academic Scholar</b>
2018	<b>International Baccalaureate Diploma Recipient</b>

### 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*

### Presentations

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

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

<sup>Δ</sup> *presenter*

### Leadership

2020 – 2023	<b>Artificial Intelligence Club (AI@UCF)</b> , University of Central Florida, Orlando, FL <b>Discussions Director</b> (April 2022 – April 2023) <b>Vice President</b> (April 2021 – April 2022) <b>Coordinator</b> (Feb. 2021 – April 2021)
2020 – 2022	<b>Cognitive Sciences Club</b> , University of Central Florida, Orlando, FL <b>President</b> (Dec. 2020 – April 2022) <b>Secretary</b> (July 2020 – Dec. 2020)
2019 – 2020	<b>Secretary</b> , <i>Collegiate Mathematical Society</i> , 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**; *CoCo.Sci 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 and Conferences

- 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, WEBPPL, R, JAVA, C

### **Relevant Undergraduate Coursework**

Mathematics Calculus I – III, Ordinary Differential Equations I, Logic and Proof in Mathematics, Matrix Algebra, Linear Algebra, Probability, Mathematical Modeling I, Introduction to Graph Theory, Mathematical Foundations of Machine Learning and Artificial Intelligence, Advanced Calculus I, Abstract Algebra I, 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