Junyi Chu

Email: junyichu@fas.harvard.edu | Website: https://jchu10.github.io
Google Scholar: https://scholar.google.com/citations?user=jiitnhMAAAAJ

EMPLOYMENT

Postdoctoral Fellow, Department of Psychology — July 2024 – present
Stanford University, Palo Alto, CA
Advisors: Judy Fan, Hyowon Gweon

Postdoctoral Fellow, Department of Psychology — July 2023 – June 2024
Harvard University, Cambridge, MA
Advisors: Elizabeth Bonawitz, Tomer Ullman

EDUCATION

Ph.D. in Cognitive Science — Sept 2017 – May 2023
Massachusetts Institute of Technology
Dissertation committee: Laura Schulz (advisor), Josh Tenenbaum, Rebecca Saxe, Caren Walker
"*Goals, Play, & Cognitive Pragmatism: A study of flexible human minds*"

B.S., Cognitive Studies & Child Development (*Magna cum laude*) — Sept 2011 – May 2015
Vanderbilt University
Advisor: Bethany Rittle-Johnson

PUBLICATIONS

Journal Articles

[10] **Chu, J**., Tenenbaum, J.B., & Schulz, L.E. (2024) In praise of folly: Flexible goals and human cognition. *Trends in Cognitive Sciences.* doi:10.1016/j.tics/2024.03.006 [preprint]

[9] **Chu, J**. & Schulz, L.E. (2023) Not playing by the rules: Exploratory play, rational action, and efficient search. *Open Mind* 1-24. doi:10.1162/opmi_a_00076 [pdf] [preprint] [OSF]

[8] Erel, Y., Adams Shannon, K., **Chu, J**., Scott, K., Kline Struhl, M., Cao, P., Tan, X., Hart, P., Raz, G., Piccolo, S., Mei, C., Potter, C., Jaffe-Dax, S., Lew-Williams, C., Tenenbaum, J., Fairchild, K., Bermano, A.., Liu, S. (2023). iCatcher+: Robust and automated annotation of infant gaze from videos collected in laboratory, field, and online studies. *Advances in Methods and Practices in Psychological Science.* doi:10.1177/25152459221147250 [preprint] [OSF] [github]

[7] **Chu, J**. & Schulz, L.E. (2021). Children selectively endorse speculative conjectures. *Child Development*. doi: 10.1111/cdev.13647

[6] **Chu, J**. & Schulz, L.E. (2020). Play, Curiosity, and Cognition. *Annual Review of Developmental Psychology, 2*. doi: 10.1146/annurev-devpsych-070120-014806 [pdf]

[5] **Chu, J**., Cheung, P., Schneider, R., Sullivan, J. & Barner, D. (2020). Counting to infinity: Does learning the syntax of the count list predict knowledge that numbers are infinite? *Cognitive Science, 44:e12875.* doi: 10.1111/cogs.12875 [pdf]

[4] Wagner, K., **Chu, J**., & Barner, D. (2019). Do children's number words begin noisy? *Developmental Science, 22(1):e12752*. doi: 10.1111/desc.12752 [pdf]

[3] Barner, D., Athanasopoulou, A., **Chu, J.**, Lewis, M., Marchand, E., Schneider, R., & Frank, M. (2017). A one-year classroom-randomized trial of mental abacus instruction for first- and second- grade students. *Journal of Numerical Cognition, 3*(3). doi: 10.5964/jnc.v3i3.106 [pdf]

[2] Scott, K.M., **Chu, J**., and Schulz, L.E. (2017). Lookit (Part 2): Assessing the viability of online developmental research: Results from three case studies. *Open Mind, 1*(1), 15-29. doi: 10.1162/OPMI_a_00001 [pdf]

[1] **Chu, J**., Rittle-Johnson, B and Fyfe, E.R. (2017). Diagrams benefit symbolic problem solving. *British Journal of*

Educational Psychology, 87, 273-287. doi: 10.1111/bjep.12149 [preprint]

In preparation

Rule, J.*, Goddu, M.K.*, **Chu, J.**, Pinter, V., Reagan, E.R Bonawitz, E., Gopnik, A., Ullman, T.D. (under review). Children selectively manipulate task difficulty when "playing for fun" vs. "trying to win".

Chu, J. & Schulz, L.E. (in prep) Because I want to: Valuing goals for their own sake

Chu, J., Hu, J. & Ullman, T.D. (in prep) The Task Task: Creative problem generation in humans and language models

Refereed conference proceedings

[7] **Chu, J**. & Schulz, L.E. (2022). Because I want to: Valuing goals for their own sake. *Proceedings of the 44nd Annual Conference of the Cognitive Science Society*. [pdf]

[6] **Chu, J**. & Schulz, L.E. (2020). Exploratory play, rational action, and efficient search. *Proceedings of the 42nd Annual Conference of the Cognitive Science Society* (pp. 959). [pdf]

[5] Brooke-Wilson, T., Rosenfeld, J.S., Hofer, M., **Chu, J**., Tenenbaum, J. (2019) Simplicity and probability in human judgment. *Proceedings of the 41st Annual Conference of the Cognitive Science Society* (pp. 1457). [abstract]

[4] **Chu, J**., Gauthier, J., Levy, R., Tenenbaum, J., & Schulz, L.E. (2019). Query-guided visual search. *Proceedings of the 41st Annual Conference of the Cognitive Science Society* (pp. 1520). [abstract]

[3] **Chu, J**. & Schulz, L.E. (2018). Cognitive pragmatism: Children flexibly endorse facts and conjectures. *Proceedings of the 40th Annual Conference of the Cognitive Science Society* (pp. 226-231). [pdf]

[2] **Chu, J**., Wagner, K., & Barner, D. (2016). Children learn non-exact number word meanings first. *Proceedings of the 38th Annual Conference of the Cognitive Science Society* (pp.1595-1600). [pdf]

[1] **Chu, J**., Fyfe, E. R., & Rittle-Johnson, B. (2015). Diagrams benefit symbolic problem-solving. *Proceedings of the 37th Annual Meeting of the Cognitive Science Society* (pp. 381-386). [pdf]

CONFERENCE PRESENTATIONS

Talks

Chu, J. (2024, July). *TBD.* Talk presented at the 46th Annual Conference of the Cognitive Sciences Society.

Chu, J. & Schulz, L.E. (2022, July). *Because I want to: Valuing goals for their own sake.* Talk presented at the 44th Annual Conference of the Cognitive Sciences Society. Virtual.

Chu, J. & Schulz, L.E. (2021, July). *Play for Problems*. Talk presented at the 43rd Annual Conference of the Cognitive Sciences Society. Virtual.

Chu, J. & Schulz, L.E. (2020, July). *Exploratory play, rational action, and efficient search*. Talk presented at 42nd Annual Conference of the Cognitive Sciences Society. Virtual. [video]

Chu, J. & Schulz, L.E. (2019, October). *Refusing Reliability: Children endorse speculative conjectures that answer questions over established facts that do not.* Talk presented at the Cognitive Development Society.

Chu, J., Schneider, R., Cheung, P., Sullivan, J. & Barner, D. (2019, March). *How does counting relate to children's understanding of infinity?* Talk presented at the Society for Research in Child Development. Baltimore, MD.

Chu, J. & Schulz, L.E. (2018, July). *Cognitive pragmatism: Children flexibly endorse facts and conjectures.* Paper presented at the 40th Annual Conference of the Cognitive Sciences Society, Madison, WA.

Chu, J. & Barner, D. (2017, May). *Counting to infinity: How productive number word knowledge facilitates understanding of numerical infinity.* Talk presented at the Association for Psychological Science, Boston, MA.

Chu, J., Wagner, K. & Barner, D. (2016). *Re-visiting Give-A-Number: Children's pre-exact number word meanings*. Talk presented at the 38th Annual Conference of the Cognitive Sciences Society, Philadelphia, PA.

Chu, J., Wagner, K., & Barner, D. (2016). *Gradual learning of number words: From inexact to exact meanings.* Talk presented at the 38th Annual Conference of the Cognitive Sciences Society, Philadelphia, PA.

Poster Presentations *(^ trainees)*

Mittal, A^., **Chu, J.** & Schulz, L.E. (2024, March). *Because I want to: Valuing goals for their own sake.* Poster presented at the 2024 Biennial Meeting of the Cognitive Development Society. Pasadena, CA.

Wang-Zhao, J^., **Chu, J.**, Bonawitz, E., Ullman, T. D. (2024, March). *Sensible nonsense: Children's explanations of physical violations vary by age.* Poster presented at the Cognitive Development Society Bi-Ennial Conference, Pasadena, CA, U.S.A.

Chu, J*., Rule, J*., Goddu, M., Pinter, V., Reagan, ER., Bonawitz, E., Gopnik, A., & Ullman, T. (2024, March). *Beyond explore-exploit: Creative curiosity in play.* Poster presented at the 2024 Biennial Meeting of the Cognitive Development Society. Pasadena, CA

Chu, J., Cheyette, S., ^Diggs-Galligan, S., Tenenbaum, J.B. & Schulz, L.E. (2023, May). *Curious, creative, and complex: an account of play as goal invention.* Poster presented at the Curiosity, Creativity and Complexity conference at Columbia University, New York, NY.

Coates, N, Siegel, M, **Chu, J.**, Kline, M. Tenenbaum, J., & Schulz, L.E. (2022, July). *Preschoolers' sensitivity to abstract correlations in the properties of sets and functions*. Proceedings of the 44nd Annual Conference of the Cognitive Science Society. [abstract]

^Riskin, S., Chu, J., & Schulz, L.E. (2022, April). *Do preschoolers engage in rational reconsideration?* Poster presented at the Cognitive Development Society, Madison, WI. [poster]

^Riskin, S., **Chu, J.**, & Schulz, L.E. (2021, November). *How goals constrain children's adoption of costs.* Poster presented at the Havard Women in Psychology Summit, Cambridge, MA.

^Diggs-Galligan, S., **Chu, J.**, Tenenbaum, J., & Schulz, L.E. (2021, July). *Explore, Exploit, Create: Inventing goals in play.* Poster presented at the Cognitive Science Society (Virtual).

Lapidow, E., **Chu, J.**, & Walker, C. M. (July, 2021). *Knowing The Shape Of The Solution: Causal Structure Constrains Evaluation Of Possible Causes*. Poster Presented At Cognitive Science Society, (Virtual).

^Diggs-Galligan, S., **Chu, J.**, Tenenbaum, J., & Schulz, L.E. (2021, April). *Explore, Exploit, Create: Quantifying the dynamics of exploratory play.* Poster presented at the Society for Research in Child Development (Virtual).

Chu, J., Gauthier, J., Levy, R., Tenenbaum, J., & Schulz, L.E. (2019, July). *Query-guided visual search.* Poster presented at the 41st Annual Conference of the Cognitive Sciences Society, Montreal, Canada. [poster]

Chu, J. & Barner, D. (2017, April). *Counting to infinity: Understanding the recursive structure of the count list.* Poster presented at the Society for Research in Child Development, Austin, TX.

Chu, J., Fyfe, E., & Rittle-Johnson, B. (2015, August). *Diagrams benefit symbolic problem-solving.* Poster presented at the 37th Annual Conference of the Cognitive Sciences Society, Pasadena, CA.

Chu, J., Hall, E., Loehr, A., & Rittle-Johnson, B. (2014, November). *Promoting mathematical problem solving and explanation via homework.* Poster presented at the Tennessee Psychological Association Annual Convention, Nashville, TN.

Chu, J. & Rittle-Johnson, B. (2014, September). *External representation as problem solving tools: Using diagrams in algebra.* Poster presented at the Vanderbilt Undergraduate Research Fair, Nashville, TN.

SYMPOSIA AND WORKSHOPS ORGANIZED

[5] Colas, C., Molinaro, G., & **Chu, J.** (2024, July). *What Should I Do Now? Goal-Centric Outlooks on Learning, Exploration, and Communication*. Symposium at 46th meeting of Cognitive Science Society.

[4] Colas, C., Teodorescu, L., Ady, N., Sancaktar, C., & **Chu, J.** (2023, December). *Intrinsically Motivated Open-ended Learning*. Full day in-person workshop at NeurIPS 2023. Website: imol-workshop.github.io

[3] **Chu, J.** & Schulz, L.E. (2021, July). *Minds at Play*. Virtual full-day pre-conference workshop at 43rd meeting of

Cognitive Science Society. [description] Website: mindsatplay.github.io

[2] **Chu, J**. & Schulz, L.E. (2021, April). *Perspectives on play: Motivations and constraints across lifespan and species*. Biennial meeting of the Society for Research in Child Development.

[1] **Chu, J**. (2019, October). *Is that so? How children evaluate claims and conjectures*. Symposium for biennial meeting of the Cognitive Development Society, Louisville, KY.

FELLOWSHIPS & RESEARCH FUNDING

2024	Rand Research Innovation Fund, Harvard Psychology *($6000)*
2023	Ditmars Research Innovation Fund, Harvard Psychology *($30k, co-PI)*
2022	Fellow, Diverse Intelligences Summer Institute, St Andrews, Scotland *($3000)*
2018	Henry E. Singleton (1940) Fellowship, MIT *(Tuition and stipend)*
2017	Presidential Graduate Fellowship, MIT *(Tuition and stipend, awarded to 5% of incoming PhDs)*
2014	Littlejohn Summer Research Fellowship, Vanderbilt University *($5000)*
2012	Travel stipend, Germanic and Slavic Languages, Vanderbilt University *($600)*
2011 - 2015	Dean's Achievement Award, Vanderbilt University *(full tuition scholarship, ~$165k)*

AWARDS & HONORS

2024	Disciplinary Diversity & Integration Award (for organized symposia), Cognitive Science Society
2022	Diversity, Equity, Inclusion and Justice Impact Award, MIT BCS
2021	Graduate Student Experience Grant for "Connecting Minds" seminar, MIT *($600)*
2019	Angus MacDonald Award for Excellence in Undergraduate Teaching, MIT BCS
2019	Conference Travel Grant, MIT BCS *($800)*
2015	Best Undergraduate Thesis in Cognitive Studies, Vanderbilt University

INVITED TALKS

2024 Apr	Developmental Psychology Brown Bag, Brown University
2023 Oct	Developmental Psychology Brown Bag, Stanford University
2023 Sep	The 6th International Workshop on Intrinsically Motivated Open-ended Learning
2023 Jul	Affective Brain Lab, MIT / UCL
2022 Dec	Computation, Cognition, and Development Lab, Harvard University
2022 Oct	Shenhav Lab, Brown University
2022 Oct	Cognitive Tools Lab, UC San Diego
2022 Oct	Cognition and Learning Center, Rutgers
2022 May	Brains on Brains Symposium, Department of Brain and Cognitive Sciences, MIT
2022 Mar	Early Learning & Cognition Lab, UC San Diego
2022 Dec	Computational Cognitive Development Group, Harvard University
2021 Nov	Machine Common Sense group, MIT, Harvard, IBM
2020 Nov	Social Learning Lab, Stanford University
2019 Nov	Emerging Scholars of Psychological Science series, Princeton University

TEACHING

2019 Fall	Neuroscience of Morality (MIT Communication Intensive Elective) Teaching assistant: led weekly recitations and provided writing feedback Instructor: Dr. Rebecca Saxe, MIT

2018 Fall	Topics in Infant and Early Childhood Cognition (MIT Communication Intensive Elective) Teaching assistant and guest lecturer: mentored final projects and papers Instructor: Dr. Laura Schulz, MIT
2015 Spring	Introduction to Cognitive Development (Vanderbilt) Teaching assistant: digitalized course materials and graded student work Instructor: Dr. Georgene Troseth, Vanderbilt University
2011 Spring	Math and Science Instructor, grades 7-10 Bukit View Secondary School & Raffles Girls' School, Singapore

MENTORSHIP AND SUPERVISION

Master's and Post-baccaleurate Research Assistants

Silvia Liu, 2023 - 2024
Sanghee Song, 2023 - 2024
Verity Pinter, 2023 - 2024
Wenxiu Wang, 2023
Heyang Yin, 2019

Undergraduate Research Assistants

* *Successfully applied for non-lab funding;* † *via MIT Summer Research Program (MSRP-Bio/BCS)*

Julio Caggiano (Minerva), 2024
Kacper Malinowski (Minerva), 2024
Miranda Zhang (Berkeley), 2024
Eleanor Gao (Berkeley), 2023 - 2024
Juliana Goldsby (Berkeley), 2023 - 2024
* Asmita Mittal (Cornell), 2022 - 2024
Ana Illanes Martinez de la Vega (MIT), 2023
Alex Taylor (Wellesley), 2023
Marguerite Thesmar (MIT), 2023
Melanie Albanese (Wellesley), 2023
Felicia Du (University of Washington), 2023
Michael Sheehan (Stonehill College), 2023
Olivia Joseph (MIT), 2023
Nunu Lakew (Wellesley), 2023
Fedaa Alsoufi (MIT), 2023
Katherine Zeng (MIT), 2023
* Yuka Machino (MIT), 2023
* Kameron Garland (MIT), 2022 – 2023
* Bianca Santi (MIT), 2022 – 2023
Lauren Keller (MIT), 2022
Beyza Ciftci (Bogazici University), 2022
Grace Zhang (MIT), 2022
Faith Choe (MIT), 2022
Hyunjin (Christine) Lee (MIT) , 2022
* Ashley Lederman (MIT), 2022
Christopher Montejo (Florida International University), 2021 – 2022
* Sofia Riskin (Smith College), 2021 – 2023
* Sophia Diggs-Galligan (MIT), 2020 – 2022
† Kailande Cassamajor (Howard University), 2020
* Naomi Kirimi (MIT), 2019 – 2020
* Jinger Chong (MIT), 2019
* Heidi Li (MIT), 2019
Grace Cowles (MIT), 2019
Lucy Fu (Dartmouth University), 2019
Gabriel Kane (MIT), 2019
Alison Plump (University of Virginia), 2019
† Jaemarie Solyst (Mt Holyoke), 2018
Cindy Zhou (Wellesley), 2018
* Rucha Kelkar (MIT), 2018 – 2019

High School Research Assistants

From 2020 - 2021 I organized a remote Research Internship for high school students. Interns contributed to behavioral annotation, stimuli creation, participant recruitment, and data curation, and attended weekly journal clubs and professional development seminars. Students developed novel research proposals as final projects and presented them at a virtual poster session..

Asmita Mittal, 2021 – 2022
Crystal Liu, 2021 – 2022
Katherine Johnson, 2021
Leensyn Rivera, 2021
Lillian Switkes, 2021
Liora Jones, 2020
Kevin Wen, 2020
Claire Ma, 2020
Cynthia Lei, 2020
Elisa Dimagiba, 2020
Monica Correia, 2020
Salina Musyaju, 2020
Andre Weiss, 2020
Zoe Price, 2020

PROFESSIONAL SERVICE

Service to the department and university

2022	Graduate student representative, MIT BCS Visiting Committee
2021 - 2022	Graduate student representative, MIT BCS Graduate Affairs Committee
2021 - 2022	Organizer, MIT BCS Connecting Minds seminar

Service to the broader community

2023	Mentor, Harvard PPREP (Prospective Ph.D. RA Event in Psychology)
2023	Mentor, Cognitive Development Society Mentorship Program
2022 - 2023	Member, ManyBabies Teaching, Training, and Open Science committee
2019 - 2022	Mentor & Organizing Committee, MIT BCS Application Assistance Program
2020 - 2021	Member, MIT Lookit Researcher Working and Development Group
2020 - 2021	Member, Somerville High School Beyond the Classroom Learning Committee
2020 - 2021	College/Internship partner, Black Girls CODE
2020	"Ask a Scientist" panelist, Boston Museum of Science
2019 - 2021	Lecture series coordinator & mentor, Harvard Science In The News
2019	Guest lecturer, Beacon Hill Seminars, Boston, MA
2017 - 2018	Instructor, "Babies and Brains", MIT Educational Studies Program

Reviews

Journals: Child Development, Cognitive Development, Open Mind, Journal of Experimental Psychology: General, Journal of Experimental Child Psychology

Conferences: Cognitive Science Society, Society for Research in Child Development, Budapest CEU Conference on Cognitive Development, NeurIPS

Affiliations

Cognitive Development Society, Cognitive Science Society, Psi Chi Honors Society in Psychology

OTHER TRAINING

2022	Diversity & Inclusion Program workshops, MIT & University of Rhode Island
2022	Tools to Promote Culturally Responsive Mentorship, MIT
2022	Research Mentorship Workshop, MIT
2020	Paths of Professorship Workshop, MIT
2019	Kaufman Teaching Certificate Program, MIT
2018	Brains, Minds, & Machines Summer Course, Woods Hole, MA