

Junyi Chu

Postdoctoral Scholar

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Appointments

2024-present *Postdoctoral Scholar*, Psychology, Stanford University
2023-2024 *Postdoctoral Scholar*, Psychology, Harvard University

Education

2017-2023 PhD in Cognitive Science, Massachusetts Institute of Technology (Cambridge, MA)
2011-2015 PhD in Child Development & Cognitive Studies, Vanderbilt University (Nashville, TN)

Honors & Awards

2025 Postdoctoral Fellow, Stanford Institute for Human-Centered Artificial Intelligence (HAI)
2024 Disciplinary Diversity & Integration Award for symposia, Cognitive Science Society
2022 Fellow, Diverse Intelligences Summer Institute
2022 Diversity, Equity, Inclusion, and Justice Impact Award, MIT Department of Brain and Cognitive Sciences
2019 Angus MacDonald Award for Excellence in Undergraduate Teaching, MIT
2018 Henry E. Singleton (1940) Fellowship, MIT
2017 Presidential Graduate Fellowship, MIT (top 15% of class)
2015 Best Undergraduate Thesis in Cognitive Studies, Vanderbilt University
2014 Littlejohn Summer Research Fellowship, Vanderbilt University
2011-2015 Dean's Achievement Award, Peabody College at Vanderbilt University (full tuition scholarship)

Research Grants

2025-2026 Learning through Creation with Generative AI Seed Grant
Source: Stanford Accelerator for Learning and Stanford Institute for Human-Centered Artificial Intelligence (HAI)
Title: Enhancing math learning and engagement through game creation
Role: co-PI, w/ Judith Fan, Hyo Gweon, Nick Haber, & Hari Subramonyam
Amount: \$25,000
2025-2026 Joyful Learning Seed Grant
Source: Stanford Accelerator for Learning
Title: Joyful Self-Surprise as an Engine for Learning in Early Childhood
Role: Co-I, w/ Adani Abutto, Judith Fan, & Hyo Gweon
Amount: \$25,000

2025-2026	Rand Innovation Fund Source: Harvard University Department of Psychology Title: Creative Goal Generation and Evaluation in Humans and Machines Role: co-PI, w/ Tomer Ullman & Jennifer Hu Amount: \$6,000
2025-2026	Ditmars Innovation Fund Source: Harvard University Department of Psychology Title: Play, a computational perspective Role: co-I, w/ Tomer Ullman Amount: \$30,000

Journal articles

2025	Chu, J. , Rule, J., Goddu, M., Pinter, V., Reagan, E.R., Bonawitz, E., Gopnik, A., & Ullman, T.D. (2025) Children selectively manipulate task difficulty when "playing for fun" vs. "trying to win", <i>Developmental Psychology</i>
2024	Chu, J. , Tenenbaum, J.B., & Schulz, L.E. (2024) In praise of folly: Flexible goals and human cognition. <i>Trends in Cognitive Sciences</i>
2023	Chu, J. & Schulz, L.E. (2023) Not playing by the rules: Exploratory play, rational action, and efficient search. <i>Open Mind</i> 7: 294–317.
2023	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., Bermanno, A., Liu, S. (2023). iCatcher+: Robust and automated annotation of infant gaze from videos collected in laboratory, field, and online studies. <i>Advances in Methods and Practices in Psychological Science</i>
2021	Chu, J. & Schulz, L.E. (2021) Children selectively endorse speculative conjectures. <i>Child Development</i> .
2020	Chu, J. & Schulz, L.E. (2020) Play, Curiosity, and Cognition. <i>Annual Review of Developmental Psychology</i> , 2
2020	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? <i>Cognitive Science</i> , 44:e12875.
2019	Wagner, K., Chu, J. , & Barner, D. (2019) Do children's number words begin noisy? <i>Developmental Science</i> , 22(1):e12752.
2017	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. <i>Journal of Numerical Cognition</i> , 3(3)
2017	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. <i>Open Mind</i> , 1(1), 15-29.
2017	Chu, J. , Rittle-Johnson, B and Fyfe, E.R. (2017). Diagrams benefit symbolic problem solving. <i>British Journal of Educational Psychology</i> , 87, 273-287.

Manuscripts under review, in revision, or in preparation

under review	Rule, J., Chu, J. , Goddu, M., Pinter, V., Reagan, E.R., Bonawitz, E., Gopnik, A., & Ullman, T.D. <i>Children's play differs from both exploring and exploiting.</i>
in prep	Chu, J. & Schulz, L.E. <i>Because I want to: Valuing goals for their own sake.</i>
in prep	Chu, J. , Cheyette, S., Digges-Galligan, S., Tenenbaum, J.B., & Schulz, L.E. <i>Curious, creative, and complex: Measuring goal generation in play.</i>

Peer-reviewed Conference Proceedings

⁺ mentees for whom I served as primary or co-mentor.

- 2025 **Chu, J.**, Zheng, K.⁺, & Fan, J.E. (2025). What makes people think a puzzle is fun to solve? *Proceedings of the 47th Annual Conference of the Cognitive Science Society*.
- 2025 **Chu, J.**, O’Keeffe, M.⁺, Liu, S., Bonawitz, E., & Ullman, T.D. (2025). Stumped! Learning to think outside the box in 3–7-year-olds. *Proceedings of the 47th Annual Conference of the Cognitive Science Society*.
- 2025 Todd, G.⁺, **Chu, J.**, Davidson, G., & Xu, W. (2025). Novel goal creation and evaluation in open-ended games. *Proceedings of the 47th Annual Conference of the Cognitive Science Society*.
- 2025 Davidson, G., Todd, G., Colas, C., **Chu, J.**, Togelius, J., Tenenbaum, J.B., Gureckis, T.M., & Lake, B. (2025). Goal inference using reward-producing programs in a novel physics environment. *Proceedings of the 47th Annual Conference of the Cognitive Science Society*.
- 2025 Collins, K., Todd, G., Zhang, C.E., Weller, A., Togelius, J., **Chu, J.**, Wong, L., Griffiths, T., & Tenenbaum, J.B. (2025). Generation and evaluation in the human invention process through the lens of game design. *Proceedings of the 47th Annual Conference of the Cognitive Science Society*.
- 2024 **Chu, J.**, Hu, J., & Ullman, T.D. (2024). The task task: Creative problem generation in humans and language models. *Proceedings of the 46th Annual Conference of the Cognitive Science Society*.
- 2022 **Chu, J.** & Schulz, L.E. (2022). Because I want to: Valuing goals for their own sake. *Proceedings of the 44th Annual Conference of the Cognitive Science Society*.
- 2022 Coates, N., Siegel, M., **Chu, J.**, Kline, M., Tenenbaum, J.B., & Schulz, L.E. (2022). Preschoolers’ sensitivity to abstract correlations in the properties of sets and functions. *Proceedings of the 44th Annual Conference of the Cognitive Science Society*.
- 2021 Diggs-Galligan, S.⁺, **Chu, J.**, Tenenbaum, J.B., & Schulz, L.E. (2021). Explore, exploit, create: Inventing goals in play. *Proceedings of the 43rd Annual Conference of the Cognitive Science Society*.
- 2020 **Chu, J.** & Schulz, L.E. (2020). Exploratory play, rational action, and efficient search. *Proceedings of the 42nd Annual Conference of the Cognitive Science Society*.
- 2019 **Chu, J.**, Gauthier, J., Levy, R., Tenenbaum, J.B., & Schulz, L.E. (2019). Query-guided visual search. *Proceedings of the 41st Annual Conference of the Cognitive Science Society*.
- 2018 **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*.
- 2016 **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*.
- 2015 **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*.

Talks and Presentations

INVITED TALKS & SEMINARS

- 2026 The Generative Mind: Cognitive Foundations of Play and Discovery
Department of Psychology, Williams College
- 2026 Playful problem solving
Legos & Learn, Stanford School of Medicine, Office of Community Engagement in Anesthesiology
- 2026 Designing for play
Cooperative Systems & Intelligence Lab, National University of Singapore
- 2026 The Generative Mind: Cognitive Foundations of Play and Discovery
Department of Psychology, Emory University
- 2025 Playful problem solving
ARC Prize Foundation: Measuring Intelligence with Interactive Benchmarks, MIT

- 2025 Playful problem selection
CogSci Workshop on Meta-reasoning: deciding which game to play, which problem to solve, and when to quit.
- 2024 The puzzle and promise of play
Developmental Psychology Brown Bag, Brown University
- 2023 Goals, Play, and Cognitive Pragmatism: A study of flexible human minds
Developmental Psychology Brown Bag, Stanford University
- 2023 In praise of folly: goals, play, and problem-making
Intrinsically Motivated Open-ended Learning (IMOL) Conference, Sorbonne University
- 2023 In praise of folly: Flexible goals and intrinsic motivation
Affective Brain Lab, MIT
- 2022 Goals, play, and cognitive pragmatism
Computation, Cognition, and Development Lab, Harvard University
- 2022 Goals, play, and cognitive pragmatism
Shenhav Lab, Brown University
- 2022 Goals, play, and cognitive pragmatism
Cognitive Tools Lab, UC San Diego
- 2022 Goals, play, and cognitive pragmatism
Cognition and Learning Center, Rutgers University
- 2022 Goals, play, and cognitive pragmatism
Early Learning & Cognition Lab, UC San Diego
- 2021 Goals, Play, and Cognitive Pragmatism
Bonawitz Computational Cognitive Development Lab, Harvard University
- 2020 Play, Curiosity, and Cognition: How our goals shape learning and thinking
Social Learning Lab, Stanford University
- 2019 Beyond accuracy and efficiency: How goals shape learning and exploration
Emerging Scholars of Psychological Science, Princeton University

REFEREED CONFERENCE ABSTRACT PRESENTATIONS

- 2026 Klotz, M., **Chu, J.**, Liquin, E. (2026, April). *Step-by-step or all-at-once: Preference for insight problem solving across goals and age groups.* Poster presented at the biennial meeting of the Cognitive Development Society, Montréal, Canada.
- 2026 Liu, Y., Crighton, F. E., **Chu, J.**, Liquin, E., Bonawitz, E., & Mills, C. M. (2026). *Learning who helps about what: Variability in children's information-seeking* Poster presented at the Origins of the Social Mind (OSM) Preconference, Society for Personality and Social Psychology (SPSP), Chicago, IL
- 2025 Liu, S., **Chu, J.**, Bonawitz, E., & Ullman, T.D. (2025, July). *Stumped! Learning to think outside the box in 3–7-year-olds.* Poster presented at Society for Research in Child Development (SRCD) Biennial Meeting, Minneapolis, MN.
- 2024 Wong, M., **Chu, J.**, Ullman, T., & Bonawitz, E. (2024, March). *Objects to think by: What predicts children's pretend play preferences?* Poster presented at the biennial meeting of the Cognitive Development Society, Pasadena, CA.
- 2024 Mittal, A., **Chu, J.**, & Schulz, L.E. (2024, March). *Because I want to: Valuing goals for their own sake.* Poster presented at the biennial meeting of the Cognitive Development Society, Pasadena, CA.
- 2024 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 biennial meeting of the Cognitive Development Society, Pasadena, CA.
- 2023 **Chu, J.**, Cheyette, S., Tenenbaum, J.B., & Schulz, L.E. (2023, May) *Curious, creative, and complex: goal generation in play.* Poster presented at the Curiosity, Creativity, and Complexity Conference, New York, NY.

2022	Riskin, S., Chu, J. , & Schulz, L.E. (2022, July) <i>Do preschoolers engage in rational reconsideration?</i> . Poster presented at the biennial meeting of the Cognitive Development Society, Madison, WI.
2021	Lapidow, E., Chu, J. , & Walker, C.M. (2021, July) <i>Knowing the shape of the solution: Causal structure constrains evaluation of possible causes.</i> . Poster presented at the 43rd Annual Meeting of the Cognitive Science Society (virtual).
2019	Brooke-Wilson, T., Rosenfeld, J.S., Hofer, M., Chu, J. , & Tenenbaum, J. (2019, July) <i>Simplicity and probability in human judgment</i> . Poster presented at the 41st Annual Meeting of the Cognitive Science Society, Montreal, Canada.
2019	Chu, J. , Gauthier, J., Levy, R., Tenenbaum, J.B., & Schulz, L.E. (2019, July) <i>Query-guided visual search</i> . Poster presented at the 41st Annual Meeting of the Cognitive Science Society, Montreal, Canada.
2014	Chu, J. , Hall, E., Loehr, A., & Rittle-Johnson, B. (2014, November) <i>Promoting mathematical problem solving and explanation via homework</i> . Poster presented at the Tennessee Psychological Association Annual Convention, Nashville, TN.

Teaching

GUEST LECTURES

2026	PSYCH 230: Computational Models of the Creative Process (Stanford)
2026	PHIL 14N: Philosophy of Games (Stanford)
2024	EDU H128: Curiosity in Learning and Development (Harvard Graduate School of Education)
2018	9.85: Infant and Early Childhood Cognition (MIT)

GRADUATE TEACHING ASSISTANT, MIT

2019	9.46 Neuroscience of Morality
2018	9.85 Infant and Early Childhood Cognition

UNDERGRADUATE TEACHING ASSISTANT, VANDERBILT UNIVERSITY

2015	PSY1500, <i>Introduction to Cognitive Development</i>
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OTHER TEACHING

2018-2020	AP Physics & SAT Mathematics. MIT Academic Teaching Initiative <i>Instructor and Co-Director. Provided free weekly lectures, problem sets, and mock exams for 200+ students</i>
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Mentoring Activities

STANFORD, DEPARTMENT OF PSYCHOLOGY

Master's	Kalu Obasi (2026–present; Master's thesis in Symbolic Systems); Connie Chang (2026–present; visiting from Harvard Graduate School of Design)
Undergrad.	Imogen Lee (2025–present), James Zhang (2025–present), Carey Chang (2025–2026)

HARVARD, DEPARTMENT OF PSYCHOLOGY / GRADUATE SCHOOL OF EDUCATION

Master's	Yujung Janie Ro (2024–2025), Jiayi Song (2024), Silvia Liu (2023–2025; <i>now PhD student at UW Madison</i>), Wenxiu Wang (2023)
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Undergrad. Misha O’Keefe (2024–2025; *now PhD student at NYU*), Julio Caggiano (2024–2025), Kacper Malinowski (2024), Miranda Zhang (2024), Sanghee Song (2023–2024; *now PhD student at Harvard*), Verity Pinter (2023–2024), Eleanor Gao (2023–2024), Juliana Goldsby (2023–2024)

MIT, DEPARTMENT OF BRAIN AND COGNITIVE SCIENCES

Undergrad. RAs (n=32) ^{*}Successfully applied for non-lab research funding or fellowships. [†]Student from the MIT Summer Research Program, an internship for non-MIT undergraduates from groups underrepresented in STEM.

Alex Taylor (2023–2024), Yuka Machino^{*} (2023; *now PhD student at Stanford*), Melanie Albanese (2023), Ana de la Vega (2023), Felicia Du (2023), Michael Sheehan (2023), Olivia Joseph (2023), Nunu Lakew (2023), Fedaa Alsoufi (2023), Katherine Zeng (2023), Bianca Santi^{*} (2022–2023; *now PhD student at Princeton*), Kameron Garland (2022–2023), Lauren Keller (2022), Beyza Ciftci (2022; *now PhD student at CEU*), Grace Zhang (2022), Faith Choe (2022), Hyunjin Lee (2022), Ashley Lederman^{*} (2022), Christopher Montejo (2021–2022; FIU), Sofia Riskin^{*} (2021–2023; Smith College), Sophia Diggs-Galligan^{*} (2020–2022), Kailande Cassamajor[†] (2020), Naomi Kirimi^{*} (2019–2020), Jinger Chong^{*} (2019), Heidi Li^{*} (2019), Grace Cowles (2019), Lucy Fu (2019), Gabriel Kane (2019), Alison Plump (2019; Dartmouth), Rucha Kelkar^{*} (2018–2019), Jaemarie Solyst[†] (2018; *now PhD student at CMU*), Cindy Zhou (2018; Wellesley)

High School Interns (n=14) *Established a partnership with Somerville High School & Black Girls Code to provide summer internships for high school students from groups underrepresented in STEM. Mentored students through the full research lifecycle (video annotation, stimuli design, participant recruitment, and data processing); facilitated weekly journal clubs and professional development seminars; supervised original research proposals culminating in a capstone poster session.*

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

OTHER MENTORING

2025 Mentor, Stanford Science Small Groups
 2024 Mentor, Stanford Paths to PhD
 2024-present Mentor, Cognitive Science Society Mentorship Program
 2023-present Mentor, Cognitive Development Society Mentorship Program
 2023 Mentor, Harvard PPREP (Prospective PhD & RA Event in Psychology)
 2019-2022 Mentor and Organizer, MIT Brain & Cognitive Sciences Application Assistance Program

Professional Service

SERVICE TO THE UNIVERSITY AND BROADER COMMUNITY

2023-2025 ManyBabies Teaching, Training, and Open Science committee
 2022-2023 Lookit Researcher Working and Development Group
 2022 MIT Brain & Cognitive Sciences Institute Visiting Committee
 2021-2022 MIT Brain & Cognitive Sciences Graduate Affairs Committee
 2020-2021 Somerville High School Beyond the Classroom Learning Committee

SERVICE TO THE FIELD

Workshops & Symposia Organized

- 2025 **Chu, J.**, Verma, A., Davidson, G., Fraser, R., & Fan, J. (2025, July). *Minds in the Making: Cognitive Science and Design Thinking*. Workshop at the 47th annual meeting of the Cognitive Science Society. minds-making.github.io
- 2024 Colas, C., Ady, N., **Chu, J.**, Sancaktar, C., Teodorescu, L., Davidson, G., & Molinaro, G. (2024, December). *Intrinsically Motivated Open-ended Learning*. Workshop at NeurIPS. imol-workshop.github.io
- 2024 Colas, C., Molinaro, G., Hawkins, R., & Chu, J. (2024, July). *What Should I Do Now? Goal-Centric Outlooks on Learning, Exploration, and Communication*. Symposium at the 46th Annual Meeting of the Cognitive Science Society.
- 2023 Colas, C., Teodorescu, L., Ady, N., Sancaktar, C., & Chu, J. (2023, December). *Intrinsically Motivated Open-ended Learning*. Workshop at NeurIPS, New Orleans, LA. imol-workshop.github.io
- 2021 **Chu, J.** & Schulz, L.E. (2021, July) *Minds at Play*. Workshop at the 43rd Annual Meeting of the Cognitive Science Society. mindsatplay.github.io
- 2021 **Chu, J.** & Schulz, L.E. (2021, April) *Perspectives on Play: Motivations and Constraints Across Lifespan and Species*. Symposium at the Meeting of the Society for Research in Child Development.
- 2019 **Chu, J.** (chair) (2019, April) *Is That So? How Children Evaluate Claims and Conjectures*. Symposium at the Bi-ennial Meeting of the Cognitive Development Society, Louisville, KY.

Editorial Service

Guest Editor, Topics in Cognitive Science, Special Issue on *Goal Dynamics In Cognition*

Journal Peer Review

Child Development, Cognitive Development, Developmental Science, Journal of Experimental Child Psychology, Journal of Experimental Psychology: General, Journal of Numerical Cognition, Nature Human Behavior, Open Mind, Topics in Cognitive Science

Conference Reviewing

Budapest CEU Conference on Cognitive Development (BCCCD), Cognitive Development Society (CDS), Cognitive Science Society (CogSci), International Conference on Machine Learning (ICML), Neural Information Processing Systems (NeurIPS), Society for Research in Child Development (SRCD)

Science Outreach

- 2025 Why Do Animals Play? *Outside/In & Tumble Science Podcast for Kids*
- 2024 Cognitive Tools, *Lynbrook High School Society for Psychology and Sociology*
- 2020 Ask a Scientist Panelist, *Museum of Science (Boston, MA)*
- 2019–2021 Lecture Coordinator & Mentor, *Science in the News (Harvard, MA)*
- 2019 What can babies teach us about human intelligence? *Science in the News (Harvard, MA)*
- 2019 What can babies teach us about human intelligence? *Beacon Hill Seminars (Boston, MA)*
- 2017–2018 Babies & Brains, *MIT Educational Studies Program* Half-day workshops for 7–12th grade students, co-taught with Halie Olson & Heather Kosakowski.

Professional Development

- 2022 Tools to Promote Culturally Responsive Mentorship, *MIT*
- 2022 Diversity & Inclusion Program workshops, *MIT & University of Rhode Island*
- 2022 Research Mentorship Workshop, *MIT*

2019 Kaufman Teaching Certificate Program, *MIT*
2018 Center for Brains, Minds, & Machines Summer Course, MIT

References

Dr. Laura E. Schulz | MIT, Department of Brain & Cognitive Sciences
email: lschulz@mit.edu
Dr. Elizabeth Bonawitz | Harvard, Graduate School of Education
email: elizabeth_bonawitz@gse.harvard.edu
Dr. Judith E. Fan | Stanford University, Department of Psychology
email: jefan@stanford.edu