

JUNYI CHU

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ACADEMIC APPOINTMENTS

- 2024 - present Stanford University
Postdoctoral Fellow, *Department of Psychology*
Advisors: Judith E. Fan, Hyowon Gweon
- 2023 - 2024 Harvard University
Postdoctoral Researcher, *Department of Psychology*
Advisors: Tomer D. Ullman, Elizabeth Bonawitz

EDUCATION

- 2017 - 2023 Massachusetts Institute of Technology
Ph.D. *Cognitive Science*
Dissertation: Goals, Play, & Cognitive Pragmatism: A study of flexible human minds
Committee: Laura E. Schulz, Rebecca Saxe, Caren Walker, Josh B. Tenenbaum
- 2011 - 2015 Vanderbilt University
B.S. *Cognitive Studies & Child Development*
Thesis: Diagrams benefit symbolic problem solving
Advisor: Bethany Rittle-Johnson

GRANTS & FELLOWSHIPS

- 2025 - 2026 Stanford HAI Postdoctoral Fellow
Source: Stanford Institute for Human-Centered Artificial Intelligence
- 2025 - 2026 Joyful Learning Seed Grant
Source: Stanford Accelerator for Learning
Title: Joyful self-surprise as an Engine for Learning in Early Childhood
\$25,000, with Adani Abutto, Hyowon Gweon, & Judith Fan
- 2025 - 2026 Learning through Creation with Generative AI Seed grant
Source: Stanford Accelerator for Learning & Institute for Human-Centered Artificial Intelligence
Title: Enhancing math learning and engagement through game creation
\$25,000, with Hari Subramonyam, Nick Haber, Hyowon Gweon, & Judith Fan
- 2024 - 2025 Rand Innovation Fund
Source: Harvard University, Department of Psychology Rand Innovation Fund
Title: Creative Goal Generation and Evaluation in Humans and Machines
\$6,000, with Tomer Ullman
- 2023 - 2024 Ditmars Innovation Fund
Source: Harvard University, Department of Psychology
\$30,000, with Elizabeth Bonawitz & Tomer Ullman

HONORS & AWARDS

- 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 Brain and Cognitive Sciences
- 2019 Angus MacDonald Award for Excellence in Undergraduate Teaching, MIT
- 2018 - 2019 Henry E. Singleton (1940) Fellowship, MIT
- 2017 - 2018 Presidential Graduate Fellowship, MIT (tuition & stipend; top ~15% of incoming students)
- 2015 Best Undergraduate Thesis in Cognitive Studies, Vanderbilt University
- 2014 Littlejohn Summer Research Fellowship, Vanderbilt University
- 2011 - 2015 Dean's Achievement Award, Vanderbilt University (tuition)

PUBLICATIONS

Google Scholar: <https://scholar.google.com/citations?user=jitnhMAAAAJ>

JOURNAL ARTICLES

- under review* **Chu, J.**, Rule, J.*, Goddu, M.K.*, 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”.
- under review* Rule, J.*, **Chu, J.***, Goddu, M.K., Pinter, V., Reagan, E.R., Bonawitz, E., Gopnik, A., Ullman, T.D. (*under review*). Children’s play differs from both exploring and exploiting.
- in prep* Chu, J., O’Keeffe, M., Liu, S., Bonawitz, E., Ullman, T.D. *Stumped! Learning to think outside the box in 3-7-year-old children*.
- 2024 **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](https://doi.org/10.1016/j.tics/2024.03.006)
- 2023 **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](https://doi.org/10.1162/opmi_a_00076) [[pdf](#)] [[preprint](#)] [[OSF](#)]
- 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. *Advances in Methods and Practices in Psychological Science*. doi:[10.1177/25152459221147250](https://doi.org/10.1177/25152459221147250) [[preprint](#)] [[OSF](#)] [[github](#)]
- 2021 **Chu, J.** & Schulz, L.E. (2021). Children selectively endorse speculative conjectures. *Child Development*. doi: [10.1111/cdev.13647](https://doi.org/10.1111/cdev.13647)
- 2020 **Chu, J.** & Schulz, L.E. (2020). Play, Curiosity, and Cognition. *Annual Review of Developmental Psychology*, 2. doi: [10.1146/annurev-devpsych-070120-014806](https://doi.org/10.1146/annurev-devpsych-070120-014806) [[pdf](#)]
- 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? *Cognitive Science*, 44:e12875. doi: [10.1111/cogs.12875](https://doi.org/10.1111/cogs.12875) [[pdf](#)]
- 2019 Wagner, K., **Chu, J.**, & Barner, D. (2019). Do children’s number words begin noisy? *Developmental Science*, 22(1):e12752. doi: [10.1111/desc.12752](https://doi.org/10.1111/desc.12752) [[pdf](#)]

- 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. *Journal of Numerical Cognition*, 3(3). doi: [10.5964/jnc.v3i3.106](https://doi.org/10.5964/jnc.v3i3.106) [pdf]
- 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. *Open Mind*, 1(1), 15-29. doi: [10.1162/OPMI_a_00001](https://doi.org/10.1162/OPMI_a_00001)
- 2017 **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](https://doi.org/10.1111/bjep.12149)

CONFERENCE PROCEEDINGS

- 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 44nd Annual Conference of the Cognitive Science Society*.
- 2022 Coates, N, Siegel, M, **Chu, J.**, Kline, M. Tenenbaum, J., & Schulz, L.E. (2022). Preschoolers’ sensitivity to abstract correlations in the properties of sets and functions. *Proceedings of the 44nd Annual Conference of the Cognitive Science Society*.
- 2021 Diggs-Galligan, S., **Chu, J.**, Tenenbaum, J., & 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., & 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*

PRESENTATIONS

INVITED TALKS

- 2025 Pre-conference workshop on *Meta-reasoning: deciding which game to play, which problem to solve, and when to quit*, Cognitive Science Society
- 2024 Developmental Psychology Brown Bag, Brown University
- 2023 Developmental Psychology Brown Bag, Stanford University
- 2023 Intrinsically Motivated Open-ended Learning (IMOL) Conference, Sorbonne University
- 2023 Affective Brain Lab, MIT / UCL
- 2022 Computational, Cognition, and Development Lab, Harvard University
- 2022 Shenhav Lab, Brown University
- 2022 Cognitive Tools Lab, UC San Diego
- 2022 Cognition and Learning Center, Rutgers University
- 2022 Early Learning & Cognition Lab, UC San Diego
- 2021 Bonawitz Computational Cognitive Development Lab, Harvard University
- 2020 Social Learning Lab, Stanford University
- 2019 Emerging Scholars of Psychological Science, Princeton University

CONFERENCE TALKS

- 2025 Cognitive Science Society
 - What makes people think a puzzle is fun to solve?*
 - Stumped! Learning to think outside the box in 3-7-year-old children*
- 2024 Cognitive Science Society
 - Playful problems: What matters for having fun?*
- 2022 Cognitive Science Society
 - Because I want to: Valuing goals for their own sake*
- 2021 Society for Research in Child Development
 - Exploratory play, rational action, and efficient search*
- 2020 Cognitive Science Society
 - Exploratory play, rational action, and efficient search*
- 2019 Cognitive Development Society
 - Refusing reliability: Children endorse speculative conjectures that answer questions over established facts that do not*
- 2019 Society for Research in Child Development
 - How does counting relate to children's understanding of infinity?*
- 2018 Cognitive Science Society
 - Cognitive pragmatism: Children flexibly endorse facts and conjectures.*
- 2017 Association for Psychological Science
 - Counting to infinity: How productive number word knowledge facilitates understanding of numerical infinity*
- 2016 Cognitive Science Society
 - Re-visiting Give-A-Number: Children's pre-exact number word meanings*
 - Gradual learning of number words: From inexact to exact meanings.*

SELECTED POSTERS (^ MENTEES)

- 2025 ^Liu, S., **Chu, J.**, ^O'Keeffe, M., Bonawitz, E., & Ullman, T. (2025, May). Stumped! How well can 3-8-year-old children learn to think outside the box?. Poster to be presented at the Society for Research in Child Development 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 2024 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 2024 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 Cognitive Development Society Bi-Ennial Conference, Pasadena, CA.
- 2024 **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
- 2023 **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.
- 2022 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](#)]
- 2022 ^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](#)]
- 2021 ^Riskin, S., **Chu, J.**, & Schulz, L.E. (2021, November). *How goals constrain children's adoption of costs.* Poster presented at the Harvard Women in Psychology Summit, Cambridge, MA.
- 2021 ^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). [[abstract](#)]
- 2021 Lapidow, E., **Chu, J.**, & Walker, C. M. (2021, July). *Knowing The Shape Of The Solution: Causal Structure Constrains Evaluation Of Possible Causes.* Poster Presented At Cognitive Science Society, (Virtual). [[abstract](#)]
- 2019 Brooke-Wilson, T., Rosenfeld, J.S., Hofer, M., **Chu, J.**, Tenenbaum, J. (2019, July) *Simplicity and probability in human judgment.* Poster presented at the 41st Annual Conference of the Cognitive Sciences Society, Montreal, Canada [[abstract](#)]
- 2019 **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](#)]
- 2017 **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.
- 2015 **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.

- 2014 **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.

TEACHING

UNDERGRADUATE COURSES

- 2019 Fall **Teaching Assistant, Neuroscience of Morality**
Instructor: Rebecca Saxe, MIT
 Undergraduate Communication Intensive Elective
 Led weekly recitations and provided individual writing feedback
- 2018 Fall **Teaching Assistant, Topics in Infant and Early Childhood Cognition**
Instructor: Laura Schulz, MIT
 Undergraduate Communication Intensive Elective
 Mentored final research proposals. Delivered guest lecture on language development.
- 2015 Spring **Teaching Assistant, Introduction to Cognitive Development**
Instructor: Georgene Troseth, Vanderbilt University
 Digitized course materials and graded student work

OTHER TEACHING

- 2017 & 2018 Fall **Instructor, Babies & Brains**
with Halie Olson & Heather Kosakowski
 Half day workshop for grades 7-12 as part of MIT Educational Studies Program

MENTORING

STANFORD UNDERGRADUATES

- Undergraduate* Carey Chang (2025 - present)
 Imogen Lee (2025 - present)
 James Zhang (2025 - present)

HARVARD RESEARCH ASSISTANTS

- | | | | |
|---------------------------|---|-------------------------------|-------------------------------|
| <i>Ed.M.</i> | Jiayi Song (2024) | Yujung Janie Ro (2024 - 2025) | Wenxiu Wang (2023) |
| | Silvia Liu (2023 - 2025, now PhD student at UW Madison) | | |
| <i>Post-Baccalaureate</i> | Verity Pinter (2023-2024) | Sanghee Song (2023-2024) | |
| <i>Undergraduate</i> | Julio Caggiano (2024 - 2025) | Eleanor Gao (2023 - 2024) | Juliana Goldsby (2023 - 2024) |
| | Kacper Malinowski (2024) | Miranda Zhang (2024) | |

MIT RESEARCH ASSISTANTS

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

Alex Taylor (2023-2024)	Kameron Garland (2022-2023)	*Naomi Kirimi (2019-2020)
*Yuka Machino (2023)	Lauren Keller (2022)	*Jinger Chong (2019)
Melanie Albanese (2023)	Beyza Ciftci (2022)	*Heidi Li (2019)
Ana de la Vega (2023)	Grace Zhang (2022)	Grace Cowles (2019)
Felicia Du (2023)	Faith Choe (2022)	Lucy Fu (Dartmouth, 2019)
Michael Sheehan (2023)	Hyunjin Lee (2022)	Gabriel Kane (2019)
Olivia Joseph (2023)	*Ashley Lederman (2022)	Alison Plump (2019)
Nunu Lakew (2023)	Christopher Montejo	*Jaemarie Solyst (2018)
Fedaa Alsoufi (2023)	(2021-2022)	Cindy Zhou (2018)
Katherine Zeng (2023)	*Sofia Riskin (2021-2023)	*Rucha Kelkar (2018-2019)
*Bianca Santi (2022-2023)	*Sophia Diggs-Galligan	*Kailande Cassamajor (2020)
	(2020-2022)	

High School I hosted a remote high school summer internship in 2020 & 2021, in partnership with Somerville High School & Black Girls Code. Students contributed to behavioral annotation, stimuli design, participant recruitment, and data processing, while attending weekly journal clubs and professional development seminars. Students also developed novel research ideas and presented them at a virtual poster session.

Asmita Mittal (2021-2024, till sophomore year at Cornell)	Salina Musyaju
Crystal Liu	Katherine Johnson
Kevin Wen	Leensyn Rivera
Zoe Price	Lillian Switkes
Liora Jones	Andre Weiss
	Claire Ma
	Cynthia Lei
	Elisa Dimagiba
	Monica Correia

OTHER MENTORSHIP

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

ORGANIZED SYMPOSIA & WORKSHOPS

- 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., & Chu, J. (2024, July). *What Should I Do Now? Goal-Centric Outlooks on Learning, Exploration, and Communication*. Symposium at 46th annual meeting of the Cognitive Science Society. [[pdf](#)]
- 2023 Colas, C., Teodorescu, L., Ady, N., Sancaktar, C., & Chu, J. (2023, December). *Intrinsically Motivated Open-ended Learning*. Workshop at NeurIPS. imol-workshop.github.io
- 2021 Chu, J. & Schulz, L.E. (2021, July). *Minds at Play*. Workshop at the 43rd meeting of 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. (2019, October). *Is that so? How children evaluate claims and conjectures*. Symposium at the meeting of the Cognitive Development Society, Louisville, KY.

AD HOC REVIEWER

- Journals*
- Child Development
 - Cognitive Development
 - Journal of Experimental Psychology: General
 - Journal of Experimental Child Psychology
 - Journal of Numerical Cognition
 - Nature Human Behavior
 - Open Mind
 - Topics in Cognitive Science
- Conferences*
- The Annual Meeting of the Cognitive Science Society
 - The Society for Research in Child Development
 - The Budapest CEU Conference on Cognitive Development
 - The Annual Conference on Neural Information Processing Systems (NeurIPS)
 - The International Conference on Machine Learning (ICML)

AD HOC COMMITTEES & ADVOCACY

- 2023 - present Member, Teaching, Training, and Open Science committee, ManyBabies
- 2022 - 2023 Member, Researcher Working and Development Group, Lookit
- 2022 Student representative, Visiting Committee, MIT Brain & Cognitive Sciences
- 2021 - 2022 Student representative, Graduate Affairs Committee, MIT Brain & Cognitive Sciences
- 2019 - 2022 Member, Application Assistance Program, MIT Brain & Cognitive Science
- 2020 - 2021 Member, Beyond the Classroom Learning Committee, Somerville High School

COMMUNITY OUTREACH

- 2024 Lynbrook High School Society for Psychology and Sociology, San Jose, CA
- 2020 "Ask a Scientist" panelist, Boston Museum of Science
- 2019 - 2021 Lecture Coordinator & Mentor, Harvard Science in the News Lecture Series
- 2019 Lecturer, Harvard Science In The News
- 2019 Guest Lecturer, Beacon Hill Seminars, Boston MA
- 2017 - 2018 Instructor, "Babies & Brains", MIT Educational Studies Program (Middle & High School)

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, Woods Hole