

Ellis Cain

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Academic Appointments

Kenyon College 2026 - Current
Postdoctoral Fellow in Computing

Education

University of California, Merced 2021 – 2026
Ph.D., Cognitive and Information Sciences

- Committee: *Dr. Rachel Ryskin (Chair), Dr. Paul Smaldino, Dr. Michael Spivey*
- Dissertation: *Diachronic Language Change: Language Evolution Explains Age-Related Divergences in Language*

University of California, Merced 2025
M.Sc., Cognitive and Information Sciences

- Committee: *Dr. Rachel Ryskin (Chair), Dr. Paul Smaldino, Dr. Michael Spivey*
- Capstone: *Development in the idiolect, aging, and language evolution*

Indiana University 2017 – 2021
B.S., Cognitive Science
B.A., East Asian Languages and Culture

- *Member of Phi Beta Kappa, Chinese Flagship Program*

Publications

Journal articles:

1. **Cain, E.**, & Ryskin, R. (2025). Semantic Representations Are Updated Across the Lifespan Reflecting Diachronic Language Change. *Open Mind*, 9, 2114-2148. <https://doi.org/10.1162/OPMI.a.315> 📄
2. **Cain, E.**, Ryskin, R., & Yu, C. (2025). Cross-Situational Statistics Present in an Early Language Learning Context: Evidence from Naturalistic Parent-Child Interactions. *Cognitive Science*, 49(6), e70078. <https://escholarship.org/uc/item/3vq7v1s8> 📄

Preprints:


1. **Cain, E.**, Geballe, E., & Marghetis, T. (Preprint, under review). A literary translation cycle disentangles transmission pressures from sociocultural changes in cultural evolution. https://doi.org/10.31234/osf.io/9kvb4_v3 📄

Textbook chapters:

1. **Cain, E.**, & Yoshimi, J. (2024). Word embeddings. In J. Yoshimi (Ed.). *Neural Networks for Cognitive Science*. <https://downloads.jeffyoshimi.net/NeuralNetworksCogsci.pdf> 📄

Conference proceedings:

1. Chao, A., **Cain, E.**, & Ryskin, R. (2025). Language experience and prediction across the lifespan: evidence from diachronic fine-tuning of language models. In *Proceedings of the Annual Meeting of the Cognitive Science Society (Vol. 47)*. <https://escholarship.org/content/qt83b1p2nz/qt83b1p2nz.pdf> 📄
2. **Cain, E.**, & Ryskin, R. (2024). Diachronic change in verb usage statistics predicts differences in sentence processing across the lifespan. In *Proceedings of the Workshop on Cognitive Modeling and Computational Linguistics* (pp. 221-230). <https://aclanthology.org/2024.cmcl-1.19.pdf> 📄

3. **Cain, E.**, & Ryskin, R. (2023). Diachronic Language Change and Its Influence on Lexico-semantic Representations Across the Lifespan. *In Proceedings of the Annual Meeting of the Cognitive Science Society* (Vol. 45, No. 45). <https://escholarship.org/uc/item/943334rm> 
4. **Cain, E.**, Ryskin, R., & Yu, C. (2022). Quantifying cross-situational statistics during parent-child toy play. *In Proceedings of the Annual Meeting of the Cognitive Science Society* (Vol. 44, No. 44). <https://escholarship.org/uc/item/7w66j9bd> 
5. Zhang, Y., **Cain, E.**, Crandall, D., & Yu, C. (2022). Grounding Action Verbs in Egocentric Visual Perception. *In Proceedings of the Annual Meeting of the Cognitive Science Society* (Vol. 44, No. 44). <https://doi.org/10.31234/osf.io/yzf63> 
6. Zhang, Y., Amatuni, A., **Cain, E.**, Wang, X., Crandall, D., & Yu, C. (2021). Human Learners Integrate Visual and Linguistic Information Cross-Situational Verb Learning. *In Proceedings of the Annual Meeting of the Cognitive Science Society* (Vol. 43, No. 43). <https://escholarship.org/uc/item/6gt5t65g> 
7. Zhang, Y., Amatuni, A., **Cain, E.**, & Yu, C. (2020). Seeking Meaning: Examining a Cross-situational Solution to Learn Action Verbs Using Human Simulation Paradigm. *In Proceedings of the Annual Meeting of the Cognitive Science Society* (Vol. 42, No. 42). <https://escholarship.org/uc/item/62f132f7> 

Presentations

Invited talks:

1. Chao, A., **Cain, E.**, & Ryskin, R. (2025). Language experience and prediction across age groups: evidence from diachronic fine-tuning of language models. *For the MRPI Planning Grant: Leveraging California's Linguistic Diversity to Improve Large Language Models*. University of California
2. **Cain, E.** (2026). Computational Analysis of Language Development Across Timescales. *For the Developmental Psychology Colloquium*. University of California, Merced

Talks:

1. **Cain, E.**, Smaldino, P. & Ryskin, R. (2026). Population turnover in language evolution explains age-related differences in language preferences. *At the Cultural Evolution Society Conference (CES)*. Rabat, Morocco
2. Chao, A., **Cain, E.**, & Ryskin, R. (2025). Language experience and prediction across age groups: evidence from diachronic fine-tuning of language models. *At the California Meeting on Psycholinguistics (CAMP[8])*. Davis, CA
3. **Cain, E.**, Chao, A., & Ryskin, R. (2024). Diachronic language change explains apparent age-related differences in information-theoretic efficiency. *At the Conference on Rational Approaches in Language Science (RAILS)*. Saarbrücken, Germany
4. **Cain, E.**, Chao, A., & Ryskin, R. (2024). Stability in the production of syntactic attachment across the lifespan. *At the California Meeting on Psycholinguistics (CAMP[7])*. San Diego, CA
5. **Cain, E.**, & Ryskin, R. (2024). Diachronic change in verb usage statistics predicts differences in sentence processing across the lifespan. *At the Workshop on Cognitive Modeling and Computational Linguistics*. Bangkok, Thailand
6. **Cain, E.**, Brown-Schmidt, S., & Ryskin, R. (2023). Diachronic Verb Usage Statistics and Sentence Processing Across the Lifespan. *At the Annual Meeting of the Psychonomic Society*. San Francisco, CA
7. **Cain, E.**, Ryskin, R., & Yu, C. (2022). Quantifying cross-situational statistics during parent-child toy play. *At the Annual Meeting of the Cognitive Science Society*. Toronto, Canada

Posters:

1. Chao, A., **Cain, E.**, & Ryskin, R. (2025). Language experience and prediction across the lifespan: evidence from diachronic fine-tuning of language models. *At the Annual Meeting of the Cognitive Science Society*. San Francisco, CA
2. **Cain, E.**, Chao, A., & Ryskin, R. (2024). Diachronic language change explains apparent age-related differences in information-theoretic efficiency. *At the California Meeting on Psycholinguistics (CAMP[7])*. San Diego, CA
3. **Cain, E.**, Geballe, E., & Marghetis, T. (2024). Translation as Transmission: Disentangling the impact of cultural context from cultural transmission using an unusual English-to-English cycle of 19th century literary translations. *At the Cultural Evolution Society Conference (CES)*. Durham, UK
4. **Cain, E.**, & Ryskin, R. (2024). Neural Signatures of Language Processing Across the Lifespan. *At the Symposium of the Center for Interdisciplinary Neuroscience*. Merced, CA
5. **Cain, E.**, & Ryskin, R. (2023). Diachronic Language Change and Its Influence on Lexico-semantic Representations Across the Lifespan. *At the Annual Meeting of the Cognitive Science Society*. Sydney, AUS
6. **Cain, E.** (2023). Teaching An Old Dog New Tricks? Learning Rates, Aging, And Language Change. *At California Workshop on Evolutionary Social Science (CWESS)*. Merced, CA
7. **Cain, E.**, & Ryskin, R. (2022). Diachronic language change and meaning across the lifespan. *At Architectures and Mechanisms of Language Processing (AMLaP)*. York, UK

Research experience

Language, Interaction, and Cognition Lab PI: Dr. Rachel Ryskin; <i>University of California, Merced</i>	<i>2021 – 2026</i>
Developmental Intelligence Lab PI: Dr. Chen Yu; <i>University of Texas, Austin</i>	<i>2020 – 2022</i>
Cognitive Development Lab PI: Dr. Linda Smith; <i>Indiana University</i>	<i>Summer 2020</i>
Computational Cognition and Learning Lab PI: Dr. Chen Yu; <i>Indiana University</i>	<i>2019 – 2020</i>

Teaching Experience

Guest lecture – Introduction to Language and Linguistics IoR: Dr. Rachel Ryskin; <i>University of California, Merced</i>	<i>Spring 2026</i>
Teaching assistant – Introduction to Language and Linguistics IoR: Dr. Zenaida Aguirre-Muñoz; <i>University of California, Merced</i>	<i>Fall 2025</i>
Guest lecture – Introduction to Language and Linguistics IoR: Dr. Zenaida Aguirre-Muñoz; <i>University of California, Merced</i>	<i>Fall 2022; Fall 2025</i>
Teaching assistant – Research Methods in Psychology IoR: Dr. Yueqi Yan; <i>University of California, Merced</i>	<i>Fall 2024</i>
Guest lecture – Research Methods in Psychology IoR: Dr. Yueqi Yan; <i>University of California, Merced</i>	<i>Fall 2024</i>
Teaching assistant – Language in Minds, Brains, and Machines IoR: Dr. Rachel Ryskin; <i>University of California, Merced</i>	<i>Spring 2024</i>
Guest lecture – Language in Minds, Brains, and Machines IoR: Dr. Rachel Ryskin; <i>University of California, Merced</i>	<i>Spring 2024</i>

Guest lecture – Foundations of Cognitive Science
IoR: Dr. Tyler Marghetis; *University of California, Merced*

Fall 2023

Teaching assistant – Introduction to Cognitive Science
IoR: Dr. Michael Spivey; *University of California, Merced*

2021 – 2022

Mentorship (Undergraduate Research Supervision)

Alton Chao, currently Ph.D. student at Purdue University	<i>2023 - 2025</i>
Saloni Naik, currently Lab Manager at UC Merced	<i>2022 - 2024</i>
Dulce Pimentel-Hurlburt, currently Research Coordinator at Stanford University	<i>2023 - 2024</i>
Joe Shem, currently Undergraduate Student at UC Merced	<i>2023 - 2025</i>
Jonathan Rivera, currently Undergraduate Student at UC Merced	<i>2024 - 2025</i>
Isabella Dohnke, currently Undergraduate Student at UC Merced	<i>2023 - 2024</i>
Aryaan Mishra, currently Undergraduate Student at UC Merced	<i>2023</i>
Nora Chen, currently Associate Analyst at United Airlines	<i>2021 - 2022</i>

Grants, Fellowships, and Workshops

Graduate Dean Dissertation Dean Fellowship	<i>Spring 2026</i>
MacKenzie Scott Graduate Student Supplemental Travel Award	<i>2023</i>
Pushkin Hackathon, located at Boston College	<i>2023</i>

Languages

Natural:	English (native), Mandarin Chinese (advanced), Cantonese (novice), Classical Chinese (reading)
Computer:	<i>Expert:</i> R, Python, MATLAB, LaTeX <i>Advanced:</i> Julia, NetLogo <i>Intermediate:</i> Java, Javascript, Kotlin, HTML

References

Dr. Rachel Ryskin, *Associate Professor of Cognitive and Information Sciences*: rryskin@ucmerced.edu
Dr. Michael Spivey, *Professor of Cognitive and Information Sciences*: spivey@ucmerced.edu
Dr. Paul Smaldino, *Professor of Cognitive and Information Sciences*: psmaldino@ucmerced.edu
Dr. Jeff Yoshimi, *Professor of Cognitive and Information Sciences*: jyoshimi@ucmerced.edu
Dr. Tyler Marghetis, *Assistant Professor of Cognitive and Information Sciences*: tmarghetis@ucmerced.edu