

With cross-interdisciplinary training in linguistics, neuroscience, computer science, I bridge language processing in humans and machines to improve NLP systems and to understand human brains.

EDUCATION

University of California Irvine CA, US
Ph.D. in Language Science, Advisor: Richard Futrell 2021–Current

University of Chicago IL, US
M.A. in Computational Social Science 2019–2021
– Thesis: A noisy channel model of N400 and P600 in sentence processing (Advisor: Allyson Ettinger)

The Hong Kong Polytechnic University Hong Kong
B.A. in Chinese and Bilingual Studies 2015–2019
– Thesis: Against Semantic Prediction during Online Sentence Comprehension (Advisor: Stephen Politzer-Ahles)

RESEARCH INTEREST

- Cognitive Modeling: Modeling and tracking neural representation involved in language processing
- Language Processing: Understanding the cognitive underpinnings of language-related neural signals
- AI interpretability: Assessing linguistic capacity and cognitive ability of state-of-the-art NLP models

EXPERIENCE

Pacific Northwest National Lab Washington, US
Natural Language Processing Intern (Advisor: Omer Subasi) 2025
– Conduct meta-analysis and benchmarking of large language model evaluation metrics
– Detect LLM hallucinations using its internal representation
– Propose novel evaluation metrics leveraging tuned LLM embeddings to improve model interpretability and diagnostic precision

National Board of Medical Examiners Pennsylvania, US
Natural Language Processing Intern (Advisor: Saed Rezayi) 2024
– Used large language models (LLMs) to conduct Automatic Item Generation for medical assessment
– Implemented various automatic medical item generation pipelines, including Retrieval-Augmented Generation, Agent-based prompting, Few-shot learning
– Designed information-theoretic metrics to assess the quality of generated medical questions

University of California Irvine CA, US
PhD student (Advisor: Richard Futrell) 2021–current
– Build information-theoretic models to align LLM predictions with human brain responses
– Leverage large-scale NLP models to predict variability in neuroscience experiments
– Results published at top-tier conferences (HSP, AMLap, CogSci) and journals (Cognition)

University of Chicago Research Assistant (Advisor: Allyson Ettinger)	IL, US 2019–2021
<ul style="list-style-type: none"> – Assessing causal inference ability in LLMs to promote cognitively plausible NLP systems – Design large-scale benchmarks to probe semantic compositionality in model representations – Results published at NeurIPS and ACL 	
University of Chicago Research Assistant (Advisor: Ming Xiang)	IL, US 2019–2021
<ul style="list-style-type: none"> – Investigate the neural nature of contextual effects on language prediction – Design and conduct EEG experiments 	
University College London Summer Research (Advisor: Wing-Yee Chow)	UK 2018
<ul style="list-style-type: none"> – Investigated psychological and neurological aspects of time-course language prediction – Data collection for an eye-tracking and an ERP experiment 	
University of Cambridge Exchange Student	UK 2017
<ul style="list-style-type: none"> – Independent research on the impact of age and literacy acquisition on first language attrition 	

PUBLICATIONS

1. Upadhye, S., **Li, J.** & Futrell, R. (2025). SPACER: A Parallel Dataset of Speech Production And Comprehension of Error Repairs. In *Proceedings of the Workshop on Cognitive Modeling and Computational Linguistics*.
2. **Li, J.**, Ortega, A., Futrell, R. & Ryskin, R. (2025). Adaptation to noisy language input in real time: Evidence from ERPs. In *Proceedings of the 47th Annual Meeting of the Cognitive Science Society*.
3. **Li, J.**, & Rutrell, R. (2024). Decomposition of surprisal: Unified computational model of ERP components in language processing. *submitted*.
4. **Li, J.**, & Rutrell, R. (2024). An information-theoretic model of shallow and deep language comprehension. In *Proceedings of the 46th Annual Meeting of the Cognitive Science Society*.
5. **Li, J.**, Ou, J. & Xiang, M. (2023). Context-specific effects of violated expectations: ERP evidence. *Cognition*, 241, 105628.
6. **Li, J.**, Yu, L., & Ettinger, A. (2023). Counterfactual reasoning: Testing language models' understanding of hypothetical scenarios. In *Proceedings of the 60th Annual Meeting of the Association for Computational Linguistics*.
7. **Li, J.**, & Futrell, R. (2023). A decomposition of surprisal tracks the N400 and P600 brain potentials. In *Proceedings of the 45th Annual Meeting of the Cognitive Science Society*.
8. Upadhye, S.*, **Li, J.***, & Futrell, R. (2023) (*= equal contribution). Bridging production and comprehension: Toward an integrated computational model of error correction. In *Proceedings of the Society for Computation in Linguistics*, 6(1), 389-391.
9. **Li, J.**, & Ettinger, A. (2023) Heuristic interpretation as rational inference: A computational model of the N400 and P600 in language processing. *Cognition*, 233, 105359.
10. **Li, J.**, Yu, L., & Ettinger, A. (2022). Counterfactual reasoning: Do language models need world knowledge for causal understanding? In *Proceedings of the Workshop on neuro Causal and Symbolic AI (nCSI) at NeurIPS*.
11. **Li, J.**, & Futrell, R. (2022). A unified information-theoretic model of EEG signatures of human language processing. In *Proceedings of the Workshop on Information-Theoretic Principles in Cognitive Systems (InfoCog) at NeurIPS*.

PEER-REVIEWED CONFERENCE PRESENTATIONS

1. Chang, C.W., **Li, J.**, & Xie, X. (September, 2025). Phonetic Encoding and Sentence Predictability in Continuous Speech. Society for the Neurobiology of Language 17th Annual Meeting, Washington, US.
2. **Li, J.***, Xu, W., Kroll, J., Xie, X. (September, 2025). Adapting to Foreign-Accented Speech: ERP Evidence of Interactions Between Phonetic and Semantic Processing. Society for the Neurobiology of Language 17th Annual Meeting, Washington, US.
3. **Li, J.***, Chen, K.K.*, Wang, A., Shen, Y., Luo, Y., Futrell, R. & Chow, W.Y. (September, 2025). The good-enough listener: A visual world paradigm reveals the interaction between prediction and bottom-up input. Society for the Neurobiology of Language 17th Annual Meeting, Washington, US. (*=equal contribution)
4. **Li, J.***, Upadhye, S.*, Gandhasri, R. & Futrell, R. (March, 2025). SPACER: A Parallel Model of Speech Production And Comprehension of Error Repairs. Poster at the 37th Annual Conference on Human Sentence Processing (HSP), Maryland, US. (*= equal contribution)
5. Li, Y.*, **Li, J.*** Upadhye, S., Attali, N. & Scontras, G. (March, 2025). Language models (LMs) prefer ambiguous utterances following informative contexts. Poster at the 37th Annual Conference on Human Sentence Processing (HSP), Maryland, US. (*= equal contribution)
6. Chang, C.W., **Li, J.**, & Xie, X. (October, 2024). Sentence predictability shapes the encoding of phonetic detail. Society for the Neurobiology of Language 16th Annual Meeting, Brisbane, Australia.
7. **Li, J.**, Hao, H. & Futrell, R. (January, 2024). Language models can adapt better to within-clause than across-clause exchange errors. The 6th California Annual Meetings for Psycholinguistics (CAMP6), California, US.
8. **Li, J.**, Ortega, A., Futrell, R. & Ryskin, R. (December, 2023). Do ERP indices of rational inference in real-time comprehension track the noise rate in the environment? Poster at conference on Architectures and Mechanisms for Language Processing Asia (AMLaP Asia), Hong Kong.
9. **Li, J.**, Upadhye, S. & Futrell, R. (March, 2023). Bridging production and comprehension: A computational model of error generation and correction. Poster at the 36th Annual Conference on Human Sentence Processing (HSP), Pittsburgh, US.
10. **Li, J.**, & Futrell, R. (December, 2022). A unified information-theoretic model of EEG signatures of human language processing. *NeurIPS 2022 Workshop on Information-Theoretic Principles in Cognitive Systems*
11. **Li, J.**, Yu, L., & Ettinger, A (December, 2022). Counterfactual reasoning: Do Language Models need world knowledge for causal inference? *NeurIPS 2022 Workshop on Neuro Causal and Symbolic AI*.
12. **Li, J.**, & Futrell, R. (September, 2022). A decomposition of surprisal predicts N400 and P600 in language processing. Poster at 28th annual conference on Architectures and Mechanisms for Language Processing (AMLaP), York, UK.
13. Xu, W., **Li, J.**, Xiang, M., & Futrell, R. (July, 2022). Syntactic adaptation to short-term cue-based distributional regularities. Poster at the 44th Annual Conference Cognitive Science (CogSci), Toronto, Canada.
14. **Li, J.**, & Futrell, R. (March, 2022). Pre-trained language models can track some ERP components in language processing. Poster at the 35th Annual Conference on Human Sentence Processing (HSP), California [virtual], US.
15. Xu, W., **Li, J.**, & Xiang, M. (March, 2022). Syntactic adaptation to short-term cue-based distributional regularities. Poster at the 35th Annual Conference on Human Sentence Processing (HSP), California [virtual], US.
16. **Li, J.**, & Xiang, M. (March, 2021). The benefits and costs of language prediction: Evidence from ERPs. Short talk at the 34th Annual CUNY Conference on Human Sentence Processing (CUNY), Philadelphia [virtual], US.
17. **Li, J.**, & Ettinger, A. (March, 2021). A noisy channel of N400 and P600 effects in sentence processing. Short talk at the 34th Annual CUNY Conference on Human Sentence Processing (CUNY), Philadelphia [virtual], US.

TEACHING

Teaching Assistant at University of California Irvine

- Principles in Social Science (*Winter 2024*)
- Abnormal Psychology (*Fall 2024*)
- The fundamentals of Psychology (*Spring 2022*)
- Introduction to Linguistics (*Winter 2023, Fall 2022*)

SKILLS

- **Natural languages:** Mandarin (Native), English (Excellent), Japanese (Fluent), Cantonese (Intermediate)
- **Programming languages:** Python, R, MATLAB, Java, HTML, JavaScript
- **Softwares:** EEG, PCIBex, PsychoPy, Praat

SCHOLARSHIPS AND AWARDS

- HSP 2025 Student Travel Award (declined) 2023
- WAC + WIC Graduate Scholar Fellowship 2024
- DTEI Graduate Scholar Fellowship 2023
- CogSci 2023 Student Travel Award 2023
- HSP 2023 Student Travel Award 2023
- NeurIPS Student Travel Award 2022
- University of California Irvine Merit Fellowship 2021
- University of Chicago Merit Scholarship 2020
- University of Chicago Merit Scholarship 2019
- HKSAR Government Scholarship Fund 2019
- Undergraduate Summer Research Abroad Scholarship 2018
- Dean's Certificate of Academic Achievement 2017
- Summer Aboard Scholarship 2016

ACADEMIC SERVICE

- Organizing committee and session chair 2023-2024
2024 Meeting of the Society for Computation in Linguistics
- Member of colloquium Committee 2022-2024
Language Science Colloquium at University of California Irvine
- Reviewer 2022-2024
Psychophysiology, Behavioral Research Method, OpenMind, Language and Linguistics Compass, EMNLP, ACL, CoNLL, CAMP, SoCalNLP, CogSci