

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

National Board of Medical Examiner 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
– Understand language prediction in humans and machines
– Modeling EEG experiments with information-theoretic approach
– Use transformers and auto-regressive large neural nets to design human-like language processing system

University of Chicago IL, US
Research Assistant (Advisor: Allyson Ettinger) 2019–2021
– Model neural responses to language comprehension with noisy channel model
– Increase pragmatic interpretability of language models

University of Chicago IL, US
Research Assistant (Advisor: Ming Xiang) 2019–2021
– Investigate the neural nature of contextual effects on language prediction
– Design and conduct EEG experiments

University College London UK
Summer Research (Advisor: Wing-Yee Chow) 2018

- 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

- Independent research on the impact of age and literacy acquisition on first language attrition

PUBLICATIONS

1. **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*.
2. **Li, J.**, Ou, J. & Xiang, M. (2023). Context-specific effects of violated expectations: ERP evidence. *Cognition*, 241, 105628.
3. **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*.
4. **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*.
5. 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.
6. **Li, J.**, & Ettinger, A. (2023) Heuristic interpretation as rational inference: A computational model of the N400 and P600 in language processing. *Cognition*, 233, 105359.
7. **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*.
8. **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. (October, 2024). Sentence predictability shapes the encoding of phonetic detail. Society for the Neurobiology of Language 16th Annual Meeting, Brisbane, Australia.
2. **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.
3. **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.
4. **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.
5. **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*
6. **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*.
7. **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.

8. 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.
9. **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.
10. 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.
11. **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.
12. **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

- 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

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| • 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

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| • Organizing committee and session chair
<i>2024 Meeting of the Society for Computation in Linguistics</i> | 2023-2024 |
| • Member of colloquium Committee
<i>Language Science Colloquium at University of California Irvine</i> | 2022-2024 |

- Reviewer 2022-2024
EMNLP2024, ACL2024, Psychophysiology, EMNLP2023, ACL2023, CogSci2023, EMNLP2022, CoNLL2022, CAMP2021, CAMP2022, SoCalNLP2022