Bonan Zhao

Postdoctoral Researcher, Princeton University

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Academic Appointment

2023-now   **Postdoctoral Research Associate**, Princeton University, NJ, USA
Advisors: Tom Griffiths (Computer Science & Psychology), Natalia Vélez (Psychology)

Education

2019-2023   **PhD Psychology**, University of Edinburgh, Edinburgh, Scotland
Advisors: Neil Bramley (Psychology), Chris Lucas (Informatics)
Thesis: A computational framework of human causal generalization

2015-2017   **MSc Logic**, University of Amsterdam, Amsterdam, The Netherlands

2011-2015   **BA Philosophy**, Tsinghua University, Beijing, China

Industrial Experience

2017-2019   **Data Scientist**, Screen 6 (acquired by Samba TV), Amsterdam, The Netherlands

Awards

2022   Chinese Students Award, Great Britain–China Educational Trust
£3,000 for PhD write-up period

2022   Good Research Practice Awards (Open Research Award), Edinburgh Research Office

2020, 2021, 2022   Research Support Grants, Department of Psychology, University of Edinburgh
Total £2,125 applied and approved for running online experiments

2019-2022   Postgraduate Research Award, College of Arts, Humanities & Social Science, University of Edinburgh
£14,533 annual stipend & tuition fees at overseas rate for three years

2016   Springer Best Paper Award, European Summer School in Logic, Language and Information

2015-2017   Amsterdam Excellence Scholarship, University of Amsterdam
€12,000 annual stipend & tuition fees at overseas rate for two years

2014   Dean's Award, School of Humanities, Tsinghua University
Top 2 students in the school, GPA & service

Publications

Asterisk * marks equal contribution.

PEER-REVIEWED JOURNAL ARTICLES

2023   **Zhao, B.**, Lucas, C. G., Bramley, N. R. (2023). A model of conceptual bootstrapping in human cognition. *Nature Human Behaviour*.

2023   Bramley, N. R., **Zhao, B.**, Quillien, T., Lucas, C. G. (2023). Local search and the evolution of world models. *Topics in Cognitive Science*.

2022   **Zhao, B.**, Lucas, C. G., Bramley, N. R. (2022). How do people generalize causal relations over objects? A non-parametric Bayesian account. *Computational Brain & Behavior*, 5(1), 22-44.

2018   Capraro, V., Sippel, J., **Zhao, B.**, Hornischer, L., Savary, M., Terzopoulou, Z., Faucher, P.,

Griffioen, S. F. (2018). People making deontological judgments in the Trapdoor dilemma are perceived to be more prosocial in economic games than they actually are. *PLoS One*, 13(10), e0205066.

PEER-REVIEWED CONFERENCE PROCEEDINGS

2023   Gong, T., **Zhao, B.**, McIntosh, R. D., Lucas, C. G. (2023). A rational model of spatial neglect. In *Proceedings of the 45th Annual Conference of the Cognitive Science Society*.

2023   Gong, T., **Zhao, B.**, McIntosh, R. D., Lucas, C. G. (2023). Understanding spatial neglect: A Bayesian perspective. In *Proceedings of the Computational Cognitive Neuroscience Society Meeting*.

2023   **Zhao, B.**, Lucas, C. G., Bramley, N. R. (2023). Bootstrapping compositional generalization with cache-and-reuse. (2023). In *Proceedings of the Computational Cognitive Neuroscience Society Meeting*.

2022   **Zhao, B.**, Bramley, N. R., Lucas, C. (2022). Powering up causal generalization: A model of human conceptual bootstrapping with adaptor grammars. In *Proceedings of the 44th Annual Meeting of the Cognitive Science Society*.

2022   Xia, Z*., **Zhao, B.***, Quillien, T., Lucas, C. (2022). Dissecting causal asymmetries in inductive generalization. In *Proceedings of the 44th Annual Meeting of the Cognitive Science Society*.

2022   Marchant, N., **Zhao, B.**, Bramley, N. R., Morales, D., Chaigneau, S. E. (2022). Categorizing perceived causal events. In *Proceedings of the Annual Meeting of the 44th Cognitive Science Society*.

2021   **Zhao, B.**, Lucas, C. G., Bramley, N. R. (2021). Building object-based causal programs for human-like generalization. In *Causal Inference & Machine Learning Workshop, NeurIPS*.

2021   Valentin, S., **Zhao, B.**, Jiang, C., Bramley, N. R., Lucas, C. (2021). Symbolic and sub-symbolic systems in people and machines. In *Proceedings of the 43rd Annual Meeting of the Cognitive Science Society*.

2020   **Zhao, B.**, Bramley, N. (2020). Order Effects in One-shot Causal Generalization. In *Proceedings of the 42nd Annual Meeting of the Cognitive Science Society*.

2018   **Zhao, B.***, van de Pol, I.*, Raijmakers, M. E., Szymanik, J. (2018). Predicting cognitive difficulty of the deductive mastermind game with dynamic epistemic logic models. In *Proceedings of the 40th Annual Meeting of the Cognitive Science Society*.

BOOKS

2022   van Emde Boas, P., van Emde Boas, G., Xie, K., **Zhao, B**. (2022). *Analyzing the Logic of Sun Tzu in "The Art of War", Using Mind Maps*. Springer.

Conference and Workshop Presentations

Aug 2023   Bootstrapping compositional generalization with cache-and-reuse
Computational Cognitive Neuroscience Society Meeting (CCN), Oxford, UK

Jul 2022   Bootstrap learning complex causal concepts with adaptor grammars
Edinburgh Computational CogSci Workshop, University of Edinburgh

Jun 2022   Bootstrap learning of complex causal concepts
Reasoning Workshop, Edinburgh Laboratory for Integrated Intelligence

Dec 2021   Building object-based causal programs for human-like generalization
Causal Inference & Machine Learning: Why now?, NeurIPS, remote

Jul 2021   Causal programs in generalizations
Symbolic and sub-symbolic systems in people and machines, CogSci, remote

Jun 2021   How do people generalize causal relations over objects? A Bayesian non-parametric account
International Conference of Thinking (ICT), remote

Aug 2020	Order effects in one-shot causal generalization *Annual Meeting of the Cognitive Science Society (CogSci), remote*
Aug 2020	Predicting cognitive difficulty of the deductive mastermind game with dynamic epistemic logic models *Annual Meeting of the Cognitive Science Society (CogSci), Madison, WI, USA*
Jul 2016	Revising social networks with stubborn agents *North American Summer School on Logic, Language, and Information (NASSLLI), Rutgers,NJ, USA*
Jul 2016	Logic of closeness revision *Logic and the Foundations of Game and Decision Theory (LOFT), Maastricht, The Netherlands*
Nov 2015	Why my sugar is your poison? Type-based rationality in backward induction *LABEX CIMI Pluridisciplinary Workshop on Game Theory, Toulouse, France*

Invited Talks

Nov 2023	**OpenTalks**, Chinese Open Science Network (COSN), remote
Oct 2023	**NYUConcats**, New York University, New York, USA
Oct 2022	**Max Planck Institute for Biological Cybernetics**, Tübingen, Germany
Oct 2022	**Human Cognitive Neuroscience seminar**, University of Edinburgh, Edinburgh, UK
Sep 2022	**Computational Cognitive Science Lab**, Princeton University, remote
Sep 2022	**Computation & Cognition Lab**, Stanford University, remote
May 2022	**Computational Cognitive Science Lab**, University of Melbourne, remote
Mar 2022	**Logic and Interactive Rationality**, University of Amsterdam, remote
Mar 2022	**London Judgment and Decision Making Seminar**, UCL, London, UK
Feb 2022	**Causality in Cognition Lab**, Stanford University, remote
Jul 2021	**Computational Principles of Intelligence Lab**, MPI Tübingen, remote
Oct 2017	**DTU Compute**, Technical University of Denmark, Copenhagen, Denmark
May 2017	**Donders Institute for Brain, Cognition and Behaviour**, Nijmegen, The Netherlands
Apr 2016	**Cool Logic**, Institute for Logic, Language and Computation, Amsterdam, The Netherlands

Teaching

2022-2023	**Centre for Data, Culture & Society**, University of Edinburgh, UK Data Carpentry (instructor) Introduction to Descriptive Statistics (instructor) Version Control with git and GitHub (instructor + course design) Data Visualization with R (co-instructor) Open Research Practices (co-instructor)
2020-2023	**School of Philosophy, Psychology and Language Sciences**, University of Edinburgh, UK Causal Cognition (tutorial, TA) Logic 1 (tutorial, TA) Introduction to Cognitive Science (Python lab, TA) Univariate Statistics and Methodology using R (R lab, TA) Data Analysis for Psychology in R (R lab, TA)
2018-2019	**HackYourFuture** (free coding school for refugees), Amsterdam, The Netherlands Git and command line interface (lead lecturer) SQL and Database (co-lead lecturer) JavaScript (TA)

Service

AD-HOC REVIEWER

Conferences   Annual Meeting of the Cognitive Science Society (CogSci) 2020–2023
Conference on Cognitive Computational Neuroscience (CCN) 2023

Journals   Artificial Intelligence
Journal of Cognition
Journal of Experimental Psychology: Applied
Scientific Reports
Open Mind

ORGANIZER

2019-2022   EdinCoCoSci lab meetings, University of Edinburgh

2016-2017   Logic Tea seminar series, University of Amsterdam

OUTREACH

2023   Outreach volunteer, Chinese Open Science Network (COSN)

2021-2022   Open Research Facilitator, University of Edinburgh
Organized 12 workshops and tutorials about open research practices
Built and maintained school-wise open research information hub

Mentoring

2023   Ham Huang, PhD Psychology, Princeton University

2023   Lucas Linzmeier, BS Computer Science, Princeton University

2021   Zeyu Xia, MSc Informatics, University of Edinburgh

References

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Christopher G. Lucas c.lucas@ed.ac.uk

Thomas L. Griffiths tomg@princeton.edu

Natalia Vélez nvelez@princeton.edu

Sonja Smets S.J.L.Smets@uva.nl

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