

# Neil Robert Bramley

## Curriculum Vitae

# Academic experience

- 2019–present Lecturer in Cognitive Psychology (Assistant Professor equiv.), Department of Psychology, School of Philosophy, Psychology and Language Sciences, University of Edinburgh, Scotland.
  - 2017–2018 **Moore-Sloan Postdoctoral Associate**, *Psychology Department & Center for Data Science*, New York University, New York, NY, USA.
    - 2015 **Visiting Researcher**, *CoCoSci Lab*, Department of Psychology, University of California, Berkeley, USA.
  - 2011–2012 **Research Assistant**, *Biological and Experimental Psychology*, Queen Mary, University of London, England.

#### Education

2013–2017 PhD, Experimental Psychology, UCL, London.

Title: Constructing the world: Active causal learning in cognition Supervisors: Prof David Lagnado & Prof Peter Dayan Winner 2017 BPS Award for Outstanding Doctoral Research

- 2012–2013 MRes, Computer Science, UCL, London.
- 2010–2011 MSc, Cognitive & Decision Sciences, UCL, London.
- 2005–2009 MA (Hons), Philosophy, University of Glasgow, Glasgow.

## Publications

## Peer reviewed articles

- 1. Droop, S. and N. R. **Bramley** (2022). Inferring epistemic intention in simulated physical microworlds. In: *Proceedings of the 44<sup>th</sup> Annual Meeting of the Cognitive Science Society*. Austin, TX.
- 2. Gong, T. and N. R. **Bramley** (2022). Intuitions and Perceptual Constraints on Causal Learning from Dynamics. In: *Proceedings of the 44<sup>th</sup> Annual Meeting of the Cognitive Science Society*. Austin, TX.
- 3. Marchant, N., B. Zhao, N. R. **Bramley**, D. Morales, and S. E. Chaigneau (2022). Categorizing perceived causal events. In: *Proceedings of the 44<sup>th</sup> Annual Meeting of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.
- 4. Zhao, B., N. R. **Bramley**, and C. G. Lucas (2022). Powering up causal generalization: A model of human conceptual bootstrapping with adaptor grammars.

- 5. Donkin, C., A. Szollosi, and N. R. **Bramley** (2021). Observing effects in various contexts won't give us general psychological theories Commentary on 'The generalizability crisis' by Tal Yarkoni. *Behavioral and Brain Sciences*.
- 6. Gong, T. and N. R. **Bramley** (2021). Learning preventative and generative causal structures from point events in continuous time. In: *Causal Inference & Machine Learning: Why now? Workshop at Neural Information Processing Systems.* Ed. by E. Bareinboim, B. Scholkopf, T. Sejnowski, Y. Bengio, and J. Pearl.
- 7. Li, Z., N. R. **Bramley**, and T. M. Gureckis (2021). Expectations about future learning influence moment-to-moment feelings of suspense. *Cognition & Emotion*.
- 8. Ludwin-Peery, E. J., N. R. **Bramley**, E. Davis, and T. M. Gureckis (2021). Limits on Simulation Approaches in Intuitive Physics. *Cognitive Psychology* **127**(101396).
- 9. Valentin, S., S. Kleinegesse, N. R. **Bramley**, M. U. Gutmann, and C. G. Lucas (2021). Bayesian Optimal Experimental Design for Simulator Models of Cognition. In: *AI for Science: Mind the Gaps Workshop at Neural Information Processing Systems*. Ed. by M. Tegmark, A. Weller, M. Welling, and M. Zitnik.
- Zhao, B., C. G. Lucas, and N. R. Bramley (2021). Building Object-based Causal Programs for Human-like Generalization. In: Causal Inference & Machine Learning: Why now? – Workshop at Neural Information Processing Systems. Ed. by E. Bareinboim, B. Scholkopf, T. Sejnowski, Y. Bengio, and J. Pearl.
- 11. Zhao, B., C. G. Lucas, and N. R. **Bramley** (2021). How do people generalize causal relations over objects? A non-parametric Bayesian account. *Computational Brain & Behavior*.
- 12. Davis, Z. J., N. R. **Bramley**, and R. E. Rehder (2020). Causal structure learning in continuous systems. *Frontiers in Psychology* **11**(244).
- 13. Davis, Z. J., N. R. **Bramley**, and R. E. Rehder (2020). The paradox of time in dynamic causal systems. In: *Proceedings of the 42<sup>nd</sup> Annual Meeting of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.
- 14. Davis, Z. J., T. M. Gureckis, R. E. Rehder, and N. R. **Bramley** (2020). Human dynamic control under changing goals. In: *Causal learning for decision making workshop*. ICLR 2020.
- 15. Fränken, J.-P., N. Theodoropoulos, A. B. Moore, and N. R. **Bramley** (2020). Belief revision in a micro-social network: Modeling sensitivity to statistical dependencies in social learning. In: *Proceedings of the 42<sup>nd</sup> Annual Meeting of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.
- 16. Gong, T. and N. R. **Bramley** (2020). What you didn't see: Prevention and generation in continuous time causal induction. In: *Proceedings of the 42<sup>nd</sup> Annual Meeting of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.
- 17. Ludwin-Peery, E. J., N. R. **Bramley**, E. Davis, and T. M. Gureckis (2020). Broken Physics: A conjunction fallacy effect in intuitive physical reasoning. *Psychological Science* **31**(12), 1602–1611.
- 18. Valentin, S., N. R. **Bramley**, and C. G. Lucas (2020). Learning hidden causal structure from temporal data. In: *Proceedings of the 42<sup>nd</sup> Annual Meeting of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.
- 19. Coenen, A., A. Ruggeri, N. R. **Bramley**, and T. M. Gureckis (2019). Testing one or multiple: How Beliefs about sparsity affect causal experimentation. *Journal of Experimental Psychology: Learning, Memory & Cognition* **45**(11), 1923–1941.
- 20. Li, S., Y. Sun, S. Liu, T. Wang, T. M. Gureckis, and N. R. **Bramley** (2019). Active physical inference via reinforcement learning. In: *Proceedings of the 41<sup>st</sup> Annual Meeting of the Cognitive Science Society*. Ed. by A. Goel, C. Seifert, and C. Freksa. Austin, TX: Cognitive Science Society.
- Li, Z., N. R. Bramley, and T. M. Gureckis (2019). The critical moment is coming: Modeling the dynamics of suspense. In: *Proceedings of the 41<sup>st</sup> Annual Meeting of the Cognitive Science Society*. Ed. by A. Goel, C. Seifert, and C. Freksa. Austin, TX: Cognitive Science Society.

- 22. Ludwin-Peery, E. J., N. R. **Bramley**, E. Davis, and T. M. Gureckis (2019). Limits on the Use of Simulation in Physical Reasoning. In: *Proceedings of the 41<sup>st</sup> Annual Meeting of the Cognitive Science Society*. Ed. by A. Goel, C. Seifert, and C. Freksa. Austin, TX: Cognitive Science Society.
- 23. **Bramley**, N. R., T. Gerstenberg, R. Mayrhofer, and D. A. Lagnado (2018). Time in causal structure learning. *Journal of Experimental Psychology: Learning, Memory & Cognition* **44**(2), 1880–1910.
- 24. **Bramley**, N. R., T. Gerstenberg, J. B. Tenenbaum, and T. M. Gureckis (2018). Intuitive experimentation in the physical world. *Cognitive Psychology* **195**, 9–38.
- Bramley, N. R., A. Rothe, J. B. Tenenbaum, F. Xu, and T. M. Gureckis (2018). Grounding compositional hypothesis generation in specific instances. In: *Proceedings of the 40<sup>th</sup> Annual Meeting of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.
- 26. Davis, Z. J., N. R. **Bramley**, and R. E. Rehder (2018). Causal structure learning with continuous variables in continuous time. In: *Proceedings of the 40<sup>th</sup> Annual Meeting of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.
- 27. Davis, Z. J., N. R. **Bramley**, R. E. Rehder, and T. M. Gureckis (2018). A causal model approach to dynamic control. In: *Proceedings of the 40<sup>th</sup> Annual Meeting of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.
- 28. Meng, Y., N. R. **Bramley**, and F. Xu (2018). Children's causal interventions combine discrimination and confirmation. In: *Proceedings of the 40<sup>th</sup> Annual Meeting of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.
- 29. **Bramley**, N. R., P. Dayan, T. L. Griffiths, and D. A. Lagnado (2017). Formalizing Neurath's ship: Approximate algorithms for online causal learning. *Psychological Review* **124**(3), 301–338.
- 30. **Bramley**, N. R., R. Mayrhofer, T. Gerstenberg, and D. A. Lagnado (2017). Causal learning from interventions and dynamics in continuous time. In: *Proceedings of the 39<sup>th</sup> Annual Meeting of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.
- 31. Coenen, A., N. R. **Bramley**, A. Ruggeri, and T. M. Gureckis (2017). Beliefs about sparsity affect causal experimentation. In: *Proceedings of the 39<sup>th</sup> Annual Meeting of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.
- 32. Schulz, E., E. D. Klenske, N. R. **Bramley**, and M. Speekenbrink (2017). Strategic exploration in human adaptive control. In: *Proceedings of the 39<sup>th</sup> Annual Meeting of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.
- 33. **Bramley**, N. R., T. Gerstenberg, and J. B. Tenenbaum (2016). Natural science: Active learning in dynamic physical microworlds. In: *Proceedings of the 38<sup>th</sup> Annual Meeting of the Cognitive Science Society*. Austin, TX: Cognitive Science Society, pp.2567–2573.
- 34. McCormack, T., N. R. **Bramley**, C. Frosch, F. Patrick, and D. A. Lagnado (2016). Children's Use of Interventions to Learn Causal Structure. *Journal of Experimental Child Psychology* **141**, 1–22.
- 35. **Bramley**, N. R., P. Dayan, and D. A. Lagnado (2015). Staying afloat on Neurath's boat: Heuristics for sequential causal learning. In: *Proceedings of the 37<sup>th</sup> Annual Meeting of the Cognitive Science Society*. Austin, TX: Cognitive Science Society, pp.262–267.
- 36. **Bramley**, N. R., D. A. Lagnado, and M. Speekenbrink (2015). Conservative forgetful scholars: How people learn causal structure through interventions. *Journal of Experimental Psychology: Learning, Memory & Cognition* **41**(3), 708–731.
- 37. **Bramley**, N. R., T. Gerstenberg, and D. A. Lagnado (2014). The order of things: Inferring causal structure from temporal patterns. In: *Proceedings of the 36<sup>th</sup> Annual Meeting of the Cognitive Science Society*. Austin, TX: Cognitive Science Society, pp.236–242.

## Book chapters

38. **Bramley**, N. R., T. Gerstenberg, R. Mayrhofer, and D. A. Lagnado (2019). "Intervening in time". In: *Time and Causality in the Sciences (edited volume)*. Ed. by S. Kleinberg. Cambridge University Press.

#### Theses

- 39. **Bramley**, N. R. (2017). "Constructing the world: Active causal learning in cognition". PhD thesis. UCL.
- 40. Bramley, N. R. (2013). "Algorithms for active causal learning". MRes thesis, UCL.
- 41. Bramley, N. R. (2011). "Mechanisms of active causal learning". MSc thesis, UCL.

#### **Posters**

- 42. Fränken, J.-P., S. Valentin, C. G. Lucas, and N. R. **Bramley** (2021). *Know your network: Sensitivity to structure in social learning*. Poster presented at the 43<sup>rd</sup> Annual Meeting of the Cognitive Science Society. Austin, TX.
- 43. Ludwin-Peery, E. J., N. R. **Bramley**, E. Davis, and T. M. Gureckis (2020). *A Generalization Test of Conjunction Errors in Physical Reasoning*. Poster presented at the 42<sup>nd</sup> Annual Meeting of the Cognitive Science Society. Austin, TX.
- 44. Otero Mediero, H. and N. R. **Bramley** (2020). *Contrasting RNN-based and simulation-based models of human physical parameter inference*. Poster presented at the 42<sup>nd</sup> Annual Meeting of the Cognitive Science Society. Austin, TX.
- 45. Zhao, B. and N. R. **Bramley** (2020). *Order effects in one-shot causal generalization*. Poster presented at the 42<sup>nd</sup> Annual Meeting of the Cognitive Science Society. Austin, TX.
- 46. **Bramley**, N. R., J. D. Nelson, M. Speekenbrink, V. Crupi, and D. A. Lagnado (2014). *What should causal learners value?* Poster presented at the Annual Meeting of the Psychonomic Society.
- 47. **Bramley**, N. R., M. Speekenbrink, and D. A. Lagnado (2013). *Mechanisms of active causal learning*. Poster presented at the 35<sup>th</sup> Annual Meeting of the Cognitive Science Society.

#### Miscellaneous

- 48. Davis, Z. J., T. M. Gureckis, R. E. Rehder, and N. R. **Bramley** (2020). Human dynamic control under changing goals. In: *Causal learning for decision making workshop*. ICLR 2020.
- 49. **Bramley**, N. R. (2014). Book Review: Future-Minded: The Psychology of Agency and Control by Magda Osman. In: The London School of Economics Review of Books.

## Supervision

PhD Bonan Zhao (primary supervisor, expected 2023)

Supervision Jan-Philipp Franken (primary supervisor, expected 2023)

Tianwei Gong (primary supervisor, expected 2024)

Stephanie Droop (primary supervisor, expected 2025)

Simon Valentin (secondary supervisor, expected 2023)

Ella Markham (secondary supervisor, expected 2026)

Susanne Haridi (advisory panel, MPI Biological Cybernetics, Tübingen, expected 2026)

Victor Btesh (advisory panel, UCL, London, expected 2024)

Yuan Meng (dissertation committee, Berkeley, CA, USA, expected 2022)

Masters Maohua Nie, Edinburgh (2022)

dissertations Stephanie Droop, Edinburgh (2021)
Jonas Nagel, Edinburgh (2020)

Yuyan Zhang, Edinburgh (2020)

Tobias Thejll-Madsen (2020)

Tianwei Gong, Edinburgh (2020)

Hector Mediero, Edinburgh (2019) Mingxuan Mei, Edinburgh (2019)

Yves Wang, Galen Li, Cecilia Sun & Scarlett Liu, NYU (2018)

Pablo León Villagrá, UCL (2015) Alexandra Surdina, UCL (2014)

George Deane, UCL (2014)

Undergraduate Janice Wong & Felix Scrivens (2022)

dissertations Jim MacKay & Rapha Redfern (2022)

Zach Million, Edinburgh (2021) Archie Miles, Edinburgh (2021)

Rue Chaladauskaite & Ingrid Holmen (2019)

Emily Bowie (2019)

#### Grants

2021-2024 **£649,875**, Computational constructivism: The algorithmic basis of discovery, UKRI EPSRC New Investigator Award.

Col: Christopher G. Lucas,

Advisory panel: Fei Xu, Josh Tenenbaum, Todd Gureckis, Subramanian Ramamoorthy

## Awards and Scholarships

- 2022 Turing Postdoc Award (to Aba Szollosi with Maarten Speekenbrink and myself) (£2000)
- 2021 Edinburgh Futures Institute Small Project Award to run Computational Cogntive Science Retreat  $(\sim £2500)$
- 2021 Edinburgh University Students Association, Outstanding Course Nominee
- 2020 International Union of Psychological Science: Young Investigator Award for Basic Science
- 2017 British Psychological Society Award for Outstanding Doctoral Research Contributions to Psychology
- 2016 Experimental Psychology Society Grindley Award (£500)
- 2016 UCL School of Life & Medical Sciences, Graduate School Conference Awards (£1204)
- 2015 Robert J. Glushko and Pamela Samuelson Foundation Award for top 20 student papers at CogSci (\$500)
- 2015 UCL School of Life & Medical Sciences, Graduate School Conference Awards (£1470)
- 2015 Bogue Research Fellowship from UCL funding 3 month visit to UC Berkeley and NYU in the USA (£3000)
- 2012 2016 London Centre for Financial Computing and Analytics 4-year EPSRC PhD scholarship (£79,600)
  - 2011 Award for best performing student in MSc Cognitive Decision Sciences (£150)

#### Invited talks

- Feb 2022 CogSciCon, University of Edinburgh
- Oct 2021 Colloquium, Center for Cognitive Computation, Central European University (remote)
- Apr 2021 Colloquium, University of New South Wales, Sydney, Australia (remote)
- Jan 2021 Colloquium, University of Surrey, UK (remote)

- Apr 2020 Lab Meeting, Computational Principles of Intelligence Lab, Tübingen, Germany (remote)
- May 2020 Lab Meeting, Causality in Cognition Lab, Stanford (remote)
- Sep 2019 Psychology and Economics of Causal Reasoning, UCL, London
- Aug 2019 Interacting Minds, Egmont aan Zee, Holland
- May 2019 Task-Agnostic Reinforcement Learning Workshop, ICLR, New Orleans, USA
- Apr 2019 iSearch, Max Planck Institute, Berlin, Germany
- Mar 2019 Centre for Logic, Language & Cognition, Amsterdam, Netherlands
- Feb 2019 CDT Pizza & Data, University of Edinburgh, Scotland
- Feb 2019 Human Cognitive Neuroscience Seminar, University of Edinburgh, Scotland
- Aug 2018 Program induction workshop, CogSci2018, Madison, WI, USA
- Apr 2018 Neuroscience Showcase, Center for Data Science, NYU, New York, NY, USA
- Mar 2018 Center for Data Science lunchtime series, NYU, New York, NY, USA
- Mar 2018 Psychology colloquium, UC Berkeley, Berkeley, CA, USA
- Feb 2018 Psychology colloquium, UC Irvine, Costa Mesa, CA, USA
- Oct 2017 Tenenbaum Lab, MIT, Cambridge, MA, USA
- Aug 2017 ILCC series, Informatics Forum, University of Edinburgh, UK
- Mar 2017 ConCats, NYU, New York, NY
- Mar 2016 Summerfield lab, Experimental Psychology, University of Oxford, UK
- Oct 2015 London Judgment and Decision Making Group, UCL, London, UK
- Jul 2015 Decision Making Symposium, Birkbeck, London, UK
- Mar 2015 Computational Cognitive Science Lab, UC Berkeley, CA, USA
- Feb 2015 Centre for Logic, Language and Cognition, University of Turin, Italy
- May 2014 Max Planck Institute for Human Development, Berlin, Germany

# Conference & Workshop Presentations

- May 2019 Causal Cognition in Humans and Machines, Oxford, England
- Oct 2018 Moore Sloane Data Science Summit, Park City, UT, USA
- Oct 2017 Moore Sloane Data Science Summit, New Orleans, LA, USA
- Jul 2017 CogSci2017, London, UK
- May 2017 TaCitS, Hoboken, New Jersey
- Feb 2017 Gureckis lab talk, NYU, New York, NY, USA
- Aug 2016 CogSci2016, Philadelphia, PA, USA
- Aug 2016 ICT16, Brown University, Providence, RI, USA
- Aug 2015 CogSci2015, Pasadena, CA, USA
- Jul 2014 Decision making Bristol, University of Bristol, UK
- Jul 2013 SPUDM24, ISCE, Barcelona, Spain
- Jul 2013 MathPsych, Potsdam, Germany
- Mar 2012 TeaP (Conference on Experimental Psychology), Mannheim, Germany
- Feb 2012 Causality Workshop, Causal Cognition Group, UCL, London, UK
- Aug 2011 Causality Workshop, Causal Cognition Group, UCL, London, UK
- Mar 2011 English Graduate Conference on Lies and Deception, UCL, London, UK

## Summer schools, symposia & conferences organised

- Jul 2021 "Symbolic and sub-symbolic systems in people and machines", CogSci2021, Vienna (remote). Co-organisers: Simon Valentin, Bonan Zhao, Chentian Jiang
- Aug 2019 "Interacting Minds", Joint research centre of University of Amsterdam and University of Edinburgh. Co-organisers: Sonja Smets, Wendy Johnson, Jelle Zuidema, Raquel Fernández, Hannah Rohde, Ivan Titov, Leendert van Maanen
- Aug 2018 "Learning as Program induction" CogSci018, Madison, Wisconsin
  Discussants: Josh Tenenbaum, Fei Xu, Laura Schulz, Noah Goodman, Steven Piantadosi, Marie
  Almaric, Eric Schulz, Neil Bramley, Ishita Dasgupta, Josh Rule, Lucas Morales
- Aug 2016 "Beyond Bayes nets" ICT16, Brown University
  Discussants: James Woodward, Anna Coenen, Neil Bramley, Elias Bareinboim and Steven Sloman
- Sep 2013 "Forecasting, monitoring, controlling: Dealing with a dynamic world", UCL
  One day conference featuring Brad Love, Magda Osman, Nigel Harvey, Stephan Lewandowsky,
  Stian Reimers and many others

## Teaching

University of Edinburgh, 2021/22

PPLS10160 Causal Cognition

PSYL10090 Psychology General Tutorial

University of Edinburgh, 2020/21

PPLS10160 Causal Cognition

PSYL10090 Psychology General Tutorial

PPLS08002 Introduction to Cognitive Science

University of Edinburgh, 2019/20

PPLS08002 Causal Cognition

PSYL10090 Psychology General Tutorial

PPLS08002 Introduction to Cognitive Science

University of Edinburgh, 2018/19

PSYL10090 Psychology General Tutorial

PSYL08012 Pyschology 2B, Psychology of language lectures

#### Professional service

2020-present Editorial Board Member.

Psychological Science

2019-present **Editorial Board Member**.

Cognitive Science Society

2012-present Ad hoc reviewer.

Cognition, Psychological Science, JEP: General, JEP: Learning, Memory & Cognition, Memory & Cognition, Cognitive Science, Topics in Cognitive Science, Journal of Behavioral Decision Making, Experimental Psychology, Quarterly Journal of Experimental Psychology, Open Mind, PloS One, CogSci Conference Proceedings, Computational Brain & Behavior, Artificial Intelligence, Frontiers in Cognitive Science

2017–2018 **Seminar series organizer**, *NYU*, New York, NY.

ConCats (Concepts and categories)

2012–2016 **Seminar series organizer**, *UCL*, London, UK.

LJDM (London Judgment and Decision Making)

## Computer skills

Modelling / C, C#, Cogent, Lisp, Julia, Jupyter, Mathematica, MATLAB, Python, Pytorch, R, Scikit Learn,

statistics SPSS, Stan, Tensor Flow, WebPPL, WinBUGS

Web AWS, ActionScript, Box2D, CSS, Flash, Flask, Flex, HTML5, Hugo, Git, Java, Javascript, Jekyll,

development Perl, PHP, PsiTurk, Ruby, SQL

Misc Illustrator, Microsoft Office, LaTeX, Sublime

## Languages

English Native

Spanish Intermediate

German Basic

#### References

David A. Lagnado

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(more available upon request)