

SAM BERENS

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PERSONAL STATEMENT

An enthusiastic, ambitious, and industrious early career researcher with a keen interest in computational modelling and systems neuroscience, particularly regarding learning and memory. Skilled in designing, running, and analysing behavioural/neuroimaging experiments that rigorously test quantitative models of cognition. Committed to open, transparent, and reproducible scientific practice.

ACADEMIC PUBLICATIONS

Mojescik, K. M., **Berens, S. C.**, De Luca, F., Ritchey, M., & Bird, C. M. (2024). The Relationship Between Subjective Memory Experience and Objective Memory Performance Remains Stable Across the Lifespan. *Collabra: Psychology*, 10(1). <https://doi.org/10.1525/collabra.116195>.

Joensen, B. H., Ashton, J. E., **Berens, S. C.**, Gaskell, M. G., & Horner, A. J. (2024). An Enduring Role for Hippocampal Pattern Completion in Addition to an Emergent Nonhippocampal Contribution to Holistic Episodic Retrieval after a 24 h Delay. *Journal of Neuroscience*, 44(18). <https://doi.org/10.1523/jneurosci.1740-23.2024>.

Berens, S. C., & Bird, C. M. (2022). Hippocampal and medial prefrontal cortices encode structural task representations following progressive and interleaved training schedules. *PLOS Computational Biology*, 18(10), e1010566. <https://doi.org/10.1371/journal.pcbi.1010566>.

Joensen, B. H., Harrington, M., **Berens, S. C.**, Cairney, S., Gaskell, M. G., & Horner, A. J. (2022). Targeted memory reactivation during sleep can induce forgetting of overlapping memories. *Learning & memory (Cold Spring Harbor, NY)*. <https://doi.org/10.31234/osf.io/bx3ew>.

Cockcroft, J. P., **Berens, S. C.**, Gaskell, M. G., & Horner, A. J. (2022). Schematic information influences memory and generalisation behaviour for schema-relevant and-irrelevant information. *Cognition*, 227, 105203. <https://doi.org/10.1016/j.cognition.2022.105203>.

Horner, A. J., & **Berens, S. C.** (2022). Précis of Berens, Richards, and Horner (2020): Dissociating memory accessibility and precision in forgetting. *The Cognitive Psychology Bulletin*, 7-11.

Greenhouse-Tucknott, A., Wrightson, J. G., **Berens, S. C.**, Dekerle, J., & Harrison, N. A. (2021). Perceived fatigue does not alter effort-based decision making, but does undermine confidence in the ability to perform physical actions. *PsyArXiv*. <https://doi.org/10.31234/osf.io/pf2jy>.

Berens, S. C., Joensen, B. H., & Horner, A. J. (2021). Tracking the emergence of location-based spatial representations in human scene-selective cortex. *Journal of Cognitive Neuroscience*, 33(3), 445-462. https://doi.org/10.1162/jocn_a_01654.

Knowland, V. C., **Berens, S. C.**, Gaskell, M. G., Walker, S. A., & Henderson, L. M. (2021). Does the maturation of early sleep patterns predict language ability at school entry? A Born in Bradford study. *Journal of Child Language*, 1-23. <https://doi.org/10.1017/S0305000920000677>.

Berens, S. C., Bird, C. M., & Harrison, N. A. (2020). Minocycline differentially modulates human spatial memory systems. *Neuropsychopharmacology*, 1-8. <https://doi.org/10.1038/s41386-020-00811-8>.

Berens, S. C., Richards, B. A., & Horner, A. J. (2020). Dissociating memory accessibility and precision in forgetting. *Nature Human Behaviour*, 1-12. <https://doi.org/10.1038/s41562-020-0888-8>.

Berens, S. C., Horst, J. S., & Bird, C. M. (2018). Cross-situational learning is supported by propose-but-verify hypothesis testing. *Current Biology*, 28(7), 1132-1136.e35. <https://doi.org/10.1016/j.cub.2018.02.042>.

- Berens, S. C.**, & Horner, A. J. (2017). Theta Rhythm: Temporal Glue for Episodic Memory. *Current Biology*, 27(20), R1110-R1112. <https://doi.org/10.1016/j.cub.2017.08.048>.
- Oedekoven, C. S., Keidel, J. L., **Berens, S. C.**, & Bird, C. M. (2017). Reinstatement of memory representations for lifelike events over the course of a week. *Scientific Reports*, 7(1), 14305. <https://doi.org/10.1038/s41598-017-13938-4>.
- Berens, S. C.**, & Bird, C. M. (2017). The role of the hippocampus in generalizing configural relationships. *Hippocampus*, 27(3), 223-228. <https://doi.org/10.1002/hipo.22688>.
- De Visscher, A., **Berens, S. C.**, Keidel, J. L., Noël, M. P., & Bird, C. M. (2015). The interference effect in arithmetic fact solving: An fMRI study. *NeuroImage*, 116, 92-101. <https://doi.org/10.1016/j.neuroimage.2015.04.063>.
- Bird, C. M., **Berens, S. C.**, Horner, A. J., & Franklin, A. (2014). Categorical encoding of color in the brain. *Proceedings of the National Academy of Sciences*, 111(12), 4590-4595. <https://doi.org/10.1073/pnas.1315275111>.

ACADEMIC POSITIONS

- Lecturer in Psychology**, School of Psychology 2022 - present
University of Sussex, Brighton, UK.
- Postdoctoral Research Fellow**, School of Psychology 2020 - 2022
University of Sussex, Brighton, UK. *Supervisor: Prof Chris Bird.* £ 2015 - 2016
- Postdoctoral Research Associate**, Department of Psychology 2016 - 2020
University of York, York, UK. *Supervisor: Dr Aidan Horner.*

EDUCATION

- PhD in Psychology, University of Sussex, UK.** 2012 - 2015
1st Supervisor: Prof Chris Bird; 2nd Supervisor: Prof Jennifer Rusted.
Thesis title: "The roles of hippocampal and neocortical learning mechanisms in the human brain".
- MSc in Cognitive Neuroscience (Distinction), University of Sussex, UK.** 2011 - 2012
Dissertation supervisor: Prof Chris Bird; Advisor: Prof Jamie Ward.
Dissertation title: "Neural colour representations: Categorical and metric effects in fMRI adaptation".
- BSc (1st class, Dual Hons) in Psychology and Music Technology.** 2008 - 2011
Keele University, UK. Dissertation supervisor: Prof Nicola Edelstyn.
Dissertation title: "Recognition memory in the context of a unilateral mediodorsal thalamic lesion".

RESEARCH METHODS EXPERTISE

Experienced programmer capable of quickly generating high quality applications for stimulus presentation, data acquisition (behavioural, fMRI, electrophysiological), and data analysis. Proficient in a verity of programming languages including: Python, R, Julia, MATLAB, Shell languages, C++, Max/MSP/PD & web-based languages (HTML, JavaScript, PHP & SQL).

Regularly use a wide range of analysis techniques including (but not limited to):

- Machine learning with deep neural networks
- General/generalised linear mixed-effects models.
- Parameter optimisation for non-linear models.
- Multinomial response modelling.
- Bayesian model selection.
- State-space/mixture/Markov model estimation (via EM and MCMC algorithms).

Also experienced in developing virtual reality environments with Unreal Engine, document typesetting in L^AT_EX, and low-level audio/image manipulation. Good working knowledge of fundamental mathematics including calculus, linear algebra, and complex analysis.

SOFTWARE/EDUCATIONAL RESOURCES

HoopStats: A library of MATLAB functions for analysing circularly distributed data. Includes functions for fitting multiple distributions with unknown parameters and calculating information theoretic measures of bias and dispersion. <http://samberens.co.uk/HoopStats/Index.html>.

Sam's fMRI tools: A collection of MATLAB functions for designing and analysing functional neuroimaging experiments. <http://samberens.co.uk/CodeIndex.html>.

Sam's stats blog: Articles that aim to demystify statistical methods by providing intuitive illustrations. <http://samberens.co.uk/Blog/Index.html>.

SELECTED ORAL PRESENTATIONS

Dissociating memory accessibility and precision in forgetting.

- *Invited oral presentation at Royal Holloway, University of London.* 24th January 2022.
- *Keynote presentation at the BPS Cognitive Section Conference.* 3rd September 2021.

Learning and memory in an uncertain world.

- *Invited oral presentation at the University of Bristol, UK.* 29th March 2019.

Integrating scenes into location-based representations.

- *Oral presentation at Neuroscience 2018 (SfN), San Diego, USA.* 5th November 2018.
- *Oral presentation at the EPS Leicester Meeting, UK.* 20th April 2018.

Unsupervised learning from ambiguous events.

- *Oral presentation at the Greater Yorkshire Memory Meeting, UK.* 20th December 2016.

Middle frontal gyrus represents colour categories but not metric differences in colour.

- *Oral presentation at the British Association of Cognitive Neuroscience, UK.* 19th April 2013.

SELECTED POSTER PRESENTATIONS

Berens, S. C., & Bird, C. M. (2022). Hippocampal and medial prefrontal cortices encode structural task representations despite poor generalisation performance. *Poster presentation at the British Association of Cognitive Neuroscience.* 24th May 2022.

Berens, S. C., & Bird, C. M. (2021). Medial prefrontal cortices integrate reward contingencies and structural task knowledge to guide memory generalisations. *Poster presentation at the Festival of Neuroscience, British Neuroscience Association.* 14th April 2021.

Berens, S. C., Joensen, B. H., & Horner, A. J. (2019). Integrating scenes into location-based representations. *Poster presentation at the Festival of Neuroscience, British Neuroscience Association, Dublin, Ireland.* 14th April 2019.

Berens, S. C., Richards, B. A., & Horner, A. J. (2018). What we lose when we forget: Dissociating loss of memory accessibility and precision. *Poster presentation at Replay@CUBRIC, University of Cardiff UK.* 14th September 2018.

Berens, S. C., Horst, J. S., & Bird, C. M. (2017). Unsupervised learning from ambiguous events. *Poster presentation at the EPS workshop: Events in Memory, University of York, UK.* 10th January 2017.

Berens, S. C., Horst, J. S., & Bird, C. M. (2016). The brain systems underpinning cross-situational learning. *Poster presentation at ICOM 6, Budapest, Hungary.* 19th July 2016.

- Berens, S. C.**, & Bird, C. M. (2015). Configural learning engages the semantic memory system but generalisation involves the hippocampus. *Poster presentation at Neuroscience 2015 (SfN)*, Chicago, USA. 19th October 2015.
- Berens, S. C.**, Maud, P., Bird, C. M., Doeller, C. F., & Harrison, N. A. (2015). The effect of minocycline on hippocampal and non-hippocampal memory systems. *Poster presentation at BNA2015: Festival of Neuroscience*, Edinburgh, UK. 13th April 2015.
- Berens, S. C.**, & Bird, C. M. (2014). Configural memory representations: An event-related fMRI study of structural and non-structural learning. *Poster presentation at the 21st Annual Meeting of the Cognitive Neuroscience Society*, Boston USA. 7th April 2014.

TEACHING

Module convener

<i>Ethics and the History of Psychology</i> (MSc, Sussex)	2022 - present
<i>Topics in Cognitive Neuroscience</i> (MSc, Sussex)	2024 - present
<i>Functional Magnetic Resonance Imaging</i> (MSc, Sussex)	2024 - present

Guest lecturer

<i>Cognition in Clinical Contexts</i> (BSc, Sussex)	2021 - present
<i>Topics in Cognitive Neuroscience</i> (MSc, Sussex)	2022 - present
<i>Functional Magnetic Resonance Imaging</i> (MSc, Sussex)	2016, 2020 - 2023

Supervision of MSc & BSc student projects

University of York, UK.	2017 - 2019
University of Sussex, UK.	2013 - 2016, 2022 - present

Workshop and seminar tutor

<i>Linear Models</i> (MSc, Sussex)	2014 - 2015
<i>Discovering Statistics</i> (MSc, Sussex)	2013 - 2014
<i>Discovering Statistics & Research methods</i> (BSc, Sussex)	2012 - 2014

PUBLIC ENGAGEMENT TALKS

Public lecture at the Emergence Salon	2022
<i>Modelling the mind in machines</i> , 24 th April 2022, Brighton, UK.	
Speaker at St Augustine Catholic High School	2021
<i>Skype a Scientist</i> , 13 th December 2021.	
Public lecture at the Pint of Science Festival	2019
<i>The science of mind reading</i> , 20 th May 2019, York, UK.	
Speaker at widening participation events	2013, 2014, 2017, 2018
<i>An introduction to neuroscience research</i> , Brighton & York, UK.	
Speaker at Brighton, Hove and Sussex Sixth Form College	2013
<i>Introducing academic career paths and research</i> .	

GRANTS AND AWARDS

BPS Cognitive Section Annual Award	2021
Awarded by the British Psychological Society at the Cognitive Section Conference 2021.	
BNA poster prize	2019
Awarded by the British Neuroscience Association at the Festival of Neuroscience 2019.	
Brain travel grant	2019 & 2015
Awarded by Guarantors of Brain for the Festival of Neuroscience 2019 and SfN 2015.	

EPS Grindley grant Awarded by the Experimental Psychology Society to present at SfN 2015.	<i>2015</i>
Wellcome Trust travel award Awarded by the Wellcome Trust at the EBPS Immunopsychiatry Workshop 2014.	<i>2014</i>
ESRC and University of Sussex match funded PhD studentship	<i>2012</i>
Prize for the best performance on the MSc in Cognitive Neuroscience Awarded by the University of Sussex.	<i>2012</i>
James Hartley Prize for the best student project Awarded by Keele University.	<i>2011</i>
Nuffield undergraduate research bursary Awarded by the Nuffield Foundation to investigate source memory deficits in Parkinson's disease.	<i>2010</i>
Dean's scholarship for excellent A-level performance Awarded by Keele University.	<i>2008</i>