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

Lancaster, C. L., **Berens, S. C.**, Daly, J., Rusted, J. M., & Bird, C. M. (2024). Perceptual discrimination of complex objects: APOE e4 gene-dose effects in mid-life. *medRχiv*, 2024-10. https://doi.org/10.1101/2024.10.18.24315682.

Daly, J., De Luca, F., **Berens, S. C.**, Field, A. P., Rusted, J. M., & Bird, C. M. (2024). The effect of apolipoprotein E genotype on spatial processing in humans: a meta-analysis and systematic review. *Cortex, 177*, 268-284. https://doi.org/10.1016/j.cortex.2024.05.006.

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. *PsyArχiv*. 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 LaTeX, 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 neuroimagining 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 form 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

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

Guest lecturer

Cognition in Clinical Contexts (BSc, Sussex)	*2021 - present*
Topics in Cognitive Neuroscience (MSc, Sussex)	*2022 - present*
Functional Magnetic Resonance Imaging (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

Linear Models (MSc, Sussex)	*2014 - 2015*
Discovering Statistics (MSc, Sussex)	*2013 - 2014*
Discovering Statistics & Research methods (BSc, Sussex)	*2012 - 2014*

PUBLIC ENGAGEMENT TALKS

Public lecture at the Emergence Salon *2022*
Modelling the mind in machines, 24th April 2022, Brighton, UK.

Speaker at St Augustine Catholic High School *2021*
Skype a Scientist, 13th December 2021.

Public lecture at the Pint of Science Festival *2019*
The science of mind reading, 20th May 2019, York, UK.

Speaker at widening participation events *2013, 2014, 2017, 2018*
An introduction to neuroscience research, Brighton & York, UK.

Speaker at Brighton, Hove and Sussex Sixth Form College *2013*
Introducing academic career paths and research.

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 *2015*
Awarded by the Experimental Psychology Society to present at SfN 2015.

Wellcome Trust travel award *2014*
Awarded by the Wellcome Trust at the EBPS Immunopsychiatry Workshop 2014.

ESRC and University of Sussex match funded PhD studentship *2012*

Prize for the best performance on the MSc in Cognitive Neuroscience *2012*
Awarded by the University of Sussex.

James Hartley Prize for the best student project *2011*
Awarded by Keele University.

Nuffield undergraduate research bursary *2010*
Awarded by the Nuffield Foundation to investigate source memory deficits in Parkinson's disease.

Dean's scholarship for excellent A-level performance *2008*
Awarded by Keele University.