

# Sam Berens

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## **Personal statement**

An enthusiastic, ambitious and industrious researcher with a keen interest in cognitive modelling and systems neuroscience, particularly regarding memory. Skilled in designing, running and analysing behavioural and fMRI experiments.

## **Academic positions**

**2016 – 2018:** **Postdoctoral Research Associate**, Department of Psychology, University of York, UK. *Supervisor: Dr Aidan Horner.*

**2015 – 2016:** **Postdoctoral Research Fellow**, School of Psychology, University of Sussex, UK. *Supervisor: Dr Chris Bird.*

## **Academic publications**

**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>.

**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>.

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>.

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>.

## **Open access software tools**

**HoopStats:** A library of MATLAB functions for analysing circularly distributed data. Includes functions for fitting multiple distributions with unknown means and dispersion parameters using expectation maximisation. <http://www.samberens.co.uk/HoopStats/Index.html>.

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

### Upcoming publications

**Berens, S. C.**, Joensen, B. H., & Horner, A. J. (*in prep.*). Tracking the emergence of location-based memory representations.

**Berens, S. C.**, & Bird, C. M. (*in prep.*). Fragmented memories: Interleaved learning favours hippocampal pattern separation and retrieval-based generalisation.

**Berens, S. C.**, & Horner, A. J. (*in prep.*). Precision forgetting: How memories are lost and general patterns are extracted.

### Education

**2012 – 2015:**           **PhD in Psychology, University of Sussex, UK.**  
1<sup>st</sup> Supervisor: Dr. Chris Bird, 2<sup>nd</sup> Supervisor: Prof. Jennifer Rusted.  
*Thesis title: “The roles of hippocampal and neocortical learning mechanisms in the human brain”.*

**2011 – 2012:**           **MSc in Cognitive Neuroscience (Distinction), University of Sussex, UK.**  
Supervisor: Dr. Chris Bird, Advisor: Prof. Jamie Ward.  
*Dissertation title: “Neural colour representations: An fMRI adaptation study of categorical and metric effects” (Mark: 82%).*

**2008 – 2011:**           **BSc (Dual Hons) in Psychology and Music Technology (First Class),**  
University of Keele, UK. Supervisor: Prof. Nicola Edelstyn.  
*Dissertation title: “Recognition memory in the context of a unilateral mediodorsal thalamic lesion” (Mark: 80%).*

### IT and methods experience

Experienced MATLAB programmer capable of quickly and efficiently generating high quality functions designed for:

- stimulus presentation and behavioural response recording.
- the analysis/visualisation of various types of behavioural/neuroimaging data including (but not limited to): general/generalised mixed-effects modelling, parameter optimisation for model fitting, Bayesian model selection, multinomial response modelling, state-space/mixture model estimation (via EM and MCMC algorithms) and ROC analyses.

Also experienced in other programming languages/software applications:

- programming in C++, HTML, PHP, & JavaScript.
- the generation of virtual reality environments in Unreal Development Kit.
- low-level audio, video and image manipulation using MAX/MSP/Jitter, Adobe Photoshop and Audition.
- voice analysis and re-synthesis using PRAAT.

### **Oral presentations**

- Berens, S. C.**, Joensen, B. H., & Horner, A. J. (2017). Integrating scenes into location-based representations. *Oral presentation at the Greater Yorkshire Memory Meeting*, University of Leeds (UK), 13th December 2017. [http://samberens.co.uk/Docs/GYMM-2017\\_sBerens](http://samberens.co.uk/Docs/GYMM-2017_sBerens).
- Berens, S. C.**, Horst, J. S., & Bird, C. M. (2016). Unsupervised learning from ambiguous events. *Oral presentation at the Greater Yorkshire Memory Meeting*, Leeds Beckett University, (UK), 20th December 2016. [http://samberens.co.uk/Docs/scBerens-2016\\_XsITalk](http://samberens.co.uk/Docs/scBerens-2016_XsITalk).
- Berens, S. C.** (2014). fMRI: How it works, what it can tell us and when it turns nasty!. *Doctoral Research and Development Talk*, School of Psychology, University of Sussex, Brighton (UK), 31st January 2014.
- Berens, S. C.**, Franklin, A., & Bird, C. M. (2013). Middle frontal gyrus represents colour categories but not metric differences in colour: Evidence from fMRI adaptation. *Oral presentation at the Annual Scientific Meeting of the British Association of Cognitive Neuroscience*, Nottingham (UK), 19th April 2013.
- Berens, S. C.** (2013). Using Fieldmaps to unwarp EPI data: The good, the bad and the ugly. *Seminar presentation at the Clinical Imaging Sciences Centre*, University of Sussex, Brighton (UK), 31st May 2013.

### **Poster presentations**

- 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, York (UK), 10th January 2017. [http://samberens.co.uk/Docs/7E1105\\_EpsPoster\\_ScBerens](http://samberens.co.uk/Docs/7E1105_EpsPoster_ScBerens).
- Berens, S. C.**, Horst, J. S., & Bird, C. M. (2016). The brain systems underpinning cross-situational learning. *Poster presentation at ICOM 6*, Budapest (Hungary), 19<sup>th</sup> 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: Society for Neuroscience*, Chicago (I.L.), 19<sup>th</sup> 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), 13<sup>th</sup> April 2015.
- Berens, S. C.**, Maud, P., Bird, C. M., Doeller, C. F., & Harrison, N. A. (2014). Minocycline selectively enhances hippocampal memory function. *Poster presentation at the European Behavioural Pharmacology Society's Immunopsychiatry Workshop*, Brighton (UK), 28th June 2014.
- 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 (M.A.), 7<sup>th</sup> April 2014.

## Grants & Studentships

- 2016:**                    **Research Staff Development Fund:**  
Awarded by the University of Sussex to present work at the conference "ICOM 6" (Budapest, Hungary); £500.
- 2015:**                    **Brain Travel Grant:**  
Awarded by Guarantors of Brain to present work at the conference "Neuroscience 2015" (Society for Neuroscience); £800.
- 2015:**                    **EPS Grindley Grant:**  
Awarded by the Experimental Psychology Society to present work at the conference "Neuroscience 2015" (Society for Neuroscience); £500.
- 2014:**                    **Wellcome Trust Travel Award:**  
Awarded by the Wellcome Trust to present work at the European Behavioural Pharmacology Society's Immunopsychiatry Workshop (2014); £300.
- 2012:**                    **ESRC and University of Sussex match funded PhD studentship:**  
Fees and stipend.
- 2010:**                    **Nuffield Undergraduate Research Bursary:**  
Awarded by the Nuffield Foundation to work on a Neuropsychological investigation examining source memory deficits in Parkinson's disease; £1,440.
- 2008:**                    **Dean's scholarship for excellent A-level performance:**  
Awarded by the Keele University; £6,000.

## Awards

- 2012:**                    **Prize for the best performance on the MSc in Cognitive Neuroscience:**  
Awarded by the University of Sussex.
- 2011:**                    **James Hartley Prize for the best 3rd year student project:**  
Awarded by the University of Keele; £50 book token.
- 2007:**                    **The Duke of Edinburgh's Gold Award:**  
Included a 1,007 mile solo charity cycle ride from Lands End to John O'Groats completed within 8 days and 3 hours.

## Teaching

- 2016:**                    **University of Sussex:** Guest lecturer and practical class tutor for a masters level methods module; Functional Magnetic Resonance Imaging.
- 2016:**                    **University of Sussex:** Part supervision of MSc student project; *Hippocampal contributions to transitive inference*.
- 2014:**                    **University of Sussex:** Practical class tutor for a masters level statistics module; *Linear Models*.

- 2014:** **University of Sussex:** Part supervision of BSc student project; *The computational underpinnings of cross-situational learning: Facilitated by temporal context?*
- 2013:** **University of Sussex:** Practical & Seminar class tutor for a masters level research methods/statistics module; *Discovering Statistics (MSc level)*.
- 2013:** **University of Sussex:** Part supervision of BSc student project; *Configural memory acquisition: Contrasting the relative processing demands of structural and non-structural memory codes*.
- 2013:** **University of Sussex:** Workshop/Practical class tutor for a second year BSc research methods/statistics module; *Social Research Methods in Psychology*.
- 2012:** **University of Sussex:** Workshop/Practical class tutor for a second year BSc research methods/statistics module; *Discovering Statistics*.

### **Public Engagement**

- 2015:** **Activity coordinator at the “Brighton Science Festival”:**  
Location: Hove Park School and Sixth Form Centre, Hove, UK.
- 2013 / 2014:** **Tour guide during a widening participation day, University of Sussex:**  
An Introduction to research methods/equipment commonly used in the field of Cognitive Neuroscience: A laboratory tour.
- 2013:** **Speaker at Brighton, Hove and Sussex Sixth Form College:**  
*Introducing academic career paths and research at University.*
- 2012:** **Practical demonstrator at “State of Mind: A Consciousness Expo”:**  
Location: The Brighton Corn Exchange, UK.

### **Society memberships**

- Society for Neuroscience.
- British Neuroscience Association.
- British Neuropsychological Society.

### **Other Responsibilities**

- 2014 – 2015:** Organiser of the Doctoral Research And Development (DREADed) talks; School of Psychology, University of Sussex.
- 2013 – 2015:** Organiser of the *Cognitive Brown Bag Seminar Series*; School of Psychology, University of Sussex.
- 2012 – 2015:** Postgraduate (research) student representative; School of Psychology, University of Sussex.