

Petar P. Raykov

RESEARCHER · PSYCHOLOGY
MRC Cognition and Brain Sciences Unit, Cambridge

SUMMARY

Early career cognitive psychologist with experience of working in academia (at post-doc level). I have worked on designing studies to examine the processes involved in episodic memory. Hands on experience with both M/EEG and fMRI data analysis. I am particularly interested in understanding brain mechanisms that support memory and how they are affected by aging. More recently, I have been interested in lifestyle factors that can contribute to healthy aging and longitudinal modelling.

EDUCATION

Sussex University

PhD in Psychology (Funded by ESRC)

Falmer, UK

2016-2019

- *Title:* Neurobiology of specific and general prior knowledge
- *Supervisors:* Chris Bird & Jane Oakhill

University of Edinburgh

MSc in Human Cognitive Neuropsychology (*Distinction*)

Edinburgh, UK

2015-2016

- *Dissertation:* Retrieval Orientation, Cognitive Control and Ageing (top in year).

Loughborough University

BSc Psychology (First Class Honours)

Loughborough, UK

2011-2015

- *Dissertation:* Effects of manipulating expectancies after game play on cognitive performance.

PUBLICATIONS

Raykov, P. P., Knights, E., & Henson, R. N., (2024). Does functional system segregation mediate the effects of lifestyle on cognition in older adults?

Neurobiology of Aging, 134, 126-134,

<https://doi.org/10.1016/j.neurobiolaging.2023.11.009>

Raykov, P. P., Varga, D., & Bird, C. M. (2023). False Memories for ending of events. *Journal of Experimental Psychology: General*, 152(12), 3459-3475,

<https://doi.org/10.1037/xge0001462>

Varga, D., Raykov, P. P., Ben-Yakov, A., & Bird, C. M., (in prep). The surprising role of the hippocampus in processing prediction errors.

Raykov, P. P., Oedekoven, C. S. H., Keidel, J. & Bird, C. M. (in prep). Decreased inter-subject synchronization among people with mild cognitive impairment in the episodic memory network.

De Luca, F., Raykov, P. P., Berens, S. C., Ezzyat, Y., Davachi, L., & Bird, C. M., (in prep). Processing of goal-changes in narrative events.

Raykov, P. P.*, Bromis, K.*, Wickens, L., Roseboom, W., & Bird, C. M. (2022). The Neural Representation of Events Is Dominated by Elements that Are Most Reliably Present. *Journal of Cognitive Neuroscience*, 34(3), 517-531,

https://doi.org/10.1162/jocn_a_01802

Raykov, P. P., Keidel, J. L., Oakhill, J., & Bird, C. M. (2021). Activation of Person Knowledge in Medial Prefrontal Cortex during the Encoding of New Lifelike Events. *Cerebral Cortex*, 31(7), <https://doi.org/10.1093/cercor/bhab027>

Farooq, A., Raykov, Y. P., Raykov, P. P., & Little, M. A. (2022). Controlling for sparsity in sparse factor analysis models: adaptive latent feature sharing for piecewise linear dimensionality reduction. *Journal of Machine Learning Research* (accepted)

Raykov, P. P., Keidel, J. L., Oakhill, J., & Bird, C. M. (2019). The brain regions supporting schema-related processing of people's identities. *Cognitive neuropsychology*, 1-17. <https://doi.org/10.1080/02643294.2019.1685958>

Raykov, P., P., Keidel, J. L., Oakhill, J., & Bird, C. M. (2018). Shared contextual knowledge strengthens inter-subject synchrony and pattern similarity in the semantic network. *eNeuro*. <http://dx.doi.org/10.1101/276683>

SELECTED PRESENTATIONS

Raykov, P., Daly J., & Bird, C (Apr 2023) Effects of APOE genotype on brain activity during movie watching (Poster). *British Neuroscience Association Festival of Neuroscience*.

Raykov, P.P., Keidel, J., Oakhill, J., & Bird, C (Apr, 2021). Activation of Person Schematic Knowledge in MPFC (talk). *British Neuropsychological Society*.

Raykov, P.P., Daly J., De Luca, F., Varga, D., & Bird, C (Nov 2021). Event Memory in young and old (Talk). Celebration of 60 years Sussex University. *House of Commons*

Raykov, P. P., Bromis, K., Wickens, L., Roseboom, W., & Bird, C. M. (2021). Repeated and predictable elements are dominating memory representations (poster). *Society for Neuroscience*

Raykov, P. P., Keidel, J., Oakhill, J., & Bird, C (Apr, 2021). Schema knowledge in MPFC (poster). *British Neuroscience Association Festival of Neuroscience*.

Raykov, P. P., Keidel, J., Oakhill, J., & Bird, C (Apr, 2018). Shared contextual knowledge strengthens inter-subject synchrony and pattern similarity (Poster). *The International Conference on Learning and Memory*. (Huntington Beach, CA, USA)

Raykov, P. P., Keidel, J., Oakhill, J., & Bird, C (Nov, 2018). Prior knowledge and shared semantic representations (blitz talk) *British Neuropsychological Society*. (London, UK)

Bird, C., Keidel, J., Raykov, P. P., Oedekoven, C. (Sep 2018). Importance of the ventromedial PFC for remembering complex events (Talk). *Memory Disorders Research Society*. (Toronto, Canada).

Raykov, P. P., Keidel, J., Oakhill, J., & Bird, C (Sep, 2018). Shared representations across participants detected in the BOLD signal (Poster). *Interpreting BOLD: Furthering the dialogue between cellular and cognitive neuroscience*. (Oxford, UK)

Raykov, P.P., & Sienna, M., (Apr 2017). Proactive cognitive control, retrieval orientation and recollection selectivity (Poster). *British Neuroscience Association Festival of Neuroscience*. (Birmingham, UK)

GRANTS AND SCHOLARSHIPS

SeNSS Post-doctoral Fellowship (ESRC) £100,000 – Learning of Schemas and making sense of complex events. (2020-21)

Sussex Overseas Institutional Visits Grant (£ 1700) & *Experimental Psychological Society (EPS)* study visit grant (£2100), for a 2 month visit to Princeton University. (2018)

British Neuroscience Association Festival of Neuroscience 2023 - Poster award for open science.

Grindley Travel Grant to attend the Events in Memory Workshop, York (2017)
Highly Commended Dissertation Award 2015/2016

UK/EU masters scholarship – 100, £10 000 scholarships divided across all MSc programmes (2015)

WORK EXPERIENCE AND RESPONSIBILITIES

Cognition and Brain Sciences Unit, University of Cambridge

Research Associate *2023 – present*

My work involves running experiments addressing how predicts affect memory representations and analysing a large neuroimaging dataset, addressing how aging affects the brain and cognition. Specifically my focus is on how lifestyle factors can lead to improved health and cognition in late life.

University of Sussex

Research Fellow & Doctoral tutor

Brighton, UK

2019 - 2023

My work involved designing and running imaging and behavioural studies investigating how prior knowledge affects memories. Involved in pre-registering, analysing and writing up of projects examining event segmentation. Providing supervision to PhD students and staff less experienced with advanced fMRI analyses.

Princeton University

Study Visit

Princeton, USA

2019 - 2019

Visited the Princeton Computational Memory Lab, and Hasson lab at Princeton University. I was working on applying machine learning analysis techniques developed there to data I had collected at University of Sussex.

University of Sussex

Programme Organizer

Brighton, UK

2017 - 2018

Arranging neuroimaging meetings and aid the documentation of upcoming projects. Regularly presenting seminars on advanced fMRI analyses.

Aston University

Research Assistant

Birmingham, UK

2013 - 2014

Investigated cognitive inhibition in depression, through implementing both behavioural and neurophysiological (EEG) measures.

SKILLS

Designing, Collecting and analysing fMRI and EEG studies. Advanced fMRI analyses: MVPA, ISC, ISPS, ISFC, ICA, HMM, and various functional connectivity methods. Advanced Matlab (incl. SPM, Cogent and machine learning methods), Python (incl. scikit-learn, nilearn and brainiak), R, SPSS, Bash scripting, FSL, Basic AFNI, Basic Cluster Computing and system management, Java, HTML and SQL for running online experiments, E-prime, Multi-level modelling, Factor analysis, Non-parametric statistics, Multivariate statistics, Microsoft Office, Photoshop and Various video and audio editing software.