University of Birmingham

Dr Maria Wimber PhD

Lecturer

School of Psychology

Contact details

Telephone +44 (0)121 414 4659

Email m.wimber@bham.ac.uk

School of Psychology
University of Birmingham
Edgbaston
Birmingham
B15 2TT
UK

About

Dr Maria Wimber is a cognitive neuroscientist interested in human long-term memory. How can the brain retrieve a single past experience, given the huge amount of similar, overlapping events stored in memory? And why do some experiences transform into stable memories while others are forgotten? Maria uses a combination of imaging (fMRI, EEG/MEG) and behavioural methods with the aim to understand the neurocognitive mechanisms underlying selective memory.

Qualifications

MA, University of Regensburg (Germany)
PhD, University of Regensburg (Germany)

Biography

Dr Wimber studied Experimental Psychology at the University of Regensburg (Germany), obtaining her MA in 2004. In 2008, she finished her PhD on the neural mechanisms underlying competition in episodic memory (supervised by Karl-Heinz Bäuml). From 2008-2010, she worked as a postdoctoral researcher at the University of Magdeburg, using neuroimaging, including genetic imaging, to explore the neural processes involved in implicit and explicit memory (together with Alan Richardson-Klavehn). She then moved to the Cognition and Brain Sciences Unit in Cambridge (UK) on a post-doctoral fellowship, awarded by the German Research Foundation (DFG). At the CBU, she continued her work on selective memory reactivation and mnemonic competition (together with Michael C. Anderson and Rik Henson). She joined the School of Psychology as a Lecturer in 2013.

Teaching

Dr Wimber teaches a 1st year module on "Perception & Attention". She is also a statistics advisor supporting 3rd year Psychology students with their research projects.

Postgraduate supervision

Dr Wimber welcomes applications from talented and enthusiastic students who are interested in studying human long-term memory and its underlying neurocognitive mechanisms. Applicants should have a research-oriented background in cognitive neuroscience, experimental psychology, or computational modeling. The lab has access to a wide range of research facilities, including a 3T MRI scanner, 64-channel EEG with concurrent neurostimulation (tACS/tDCS), and behavioural testing equipment. For informal enquiries about PhD and Master's projects please email **m.wimber@bham.ac.uk**.

Research

Research interests

Dr Wimber is interested in the human long-term memory, and specifically in the neurocognitive basis of memory retrieval, i.e. the question how the human brain manages to bring back to mind past events. She is using a range of neuroimaging (fMRI, EEG/MEG) and behavioural methods aimed at understanding the neural processes and computations carried out by the brain when it retrieves past information. Dr Wimber's research broadly addressed two questions: (i) How does the selective use of our memory promote the long-term retention of some events, while other events are forgotten? She has mainly used fMRI, including state-of-the-art pattern analysis techniques as well as genetic imaging, to investigate the neurocognitive mechanisms underlying selective remembering and its consequences on forgetting. (ii) Which aspects of a memory become reactivated during remembering, and when do these processes occur? Dr Wimber is using fMRI and EEG/MEG to investigate the nature and time-course of memory reactivation. She has recently developed a novel "frequency-tagging" method that can be used to track the neural reappearance of previously stored memories in the human EEG/MEG.

Publications

Hanslmayr S, Volberg G, Wimber M, Dalal SS, Greenlee MW (2013). Prestimulus oscillatory phase at 7 Hz gates cortical information flow and visual perception. *Current Biology, 23,* 2273-2278.

Schott BH, Wüstenberg T, Wimber M, Fenker DB, Zierhut KC, Seidenbecher CI, Heinze HJ, Walter H, Düzel E, Richardson-Klavehn A (2013). The relationship between level of processing and hippocampal-cortical functional connectivity during episodic memory formation in humans. *Human Brain Mapping 34*, 407-424.

Hanslmayr S, Volberg G, Wimber M, Oehler N, Staudigl T, Hartmann T, Raabe M, Greenlee M, Bäuml KHT (2012). Prefrontally driven down-regulation of neural synchrony mediates goal-directed forgetting. *Journal of Neuroscience 32*, 14742-14751.

Wimber M, Maaß A, Staudigl T, Richardson-Klavehn A, Hanslmayr S (2012). Rapid memory reactivation revealed by oscillatory entrainment. *Current Biology 22*, 1482-1486.

Wimber M, Schott BH, Wendler F, Seidenbecher CI, Behnisch G, Macharadze T, Bäuml KHT, Richardson-Klavehn A (2011).Prefrontal dopamine and the dynamic control

of human long-term memory. *Translational Psychiatry 1: e15*, doi:10.1038/tp.2011.15.

Hanslmayr S, Volberg G, Wimber M, Raabe M, Greenlee MW, Bäuml KH (2011). The relationship between brain oscillations and BOLD signal during memory formation: a combined EEG-fMRI study. *Journal of Neuroscience, 31*, 15674-15680.

Wimber M, Heinze HJ, Richardson-Klavehn A (2010). Distinct fronto-parietal networks set the stage for later perceptual priming and episodic recognition memory. *Journal of Neuroscience, 30,* 13272-80.

Wimber M, Rutschmann RM, Greenlee MW, Bäuml K-H (2009). Retrieval from episodic memory: neural mechanisms of interference resolution. *Journal of Cognitive Neuroscience, 21*, 538-549.

Richardson-Klavehn A, Magno E, Markopoulos G, Sweeney-Reed CM, Wimber M (2009). On the intimate relationship between neurobiology and function in the theoretical analysis of human learning and memory. In F. Rösler, C. Ranganath, B. Röder, & R.H. Kluwe (Eds.), *Neuroimaging and psychological theories of human memory*. New York: Oxford University Press.

Wimber M, Bäuml K-H, Bergström Z, Markopoulos G, Heinze H-J, Richardson-Klavehn A (2008). Neural markers of inhibition in human memory retrieval. *Journal of Neuroscience, 28*, 13419-13427.

Hanslmayr S, Pastötter B, Bäuml K-H, Gruber S, Wimber M, Klimesch W (2008). The electrophysiological dynamics of interference during the Stroop task. *Journal of Cognitive Neuroscience, 20*, 215-25.

© University of Birmingham 2014