DOELLERLAB

MAX PLANCK INSTITUTE
FOR HUMAN COGNITIVE AND BRAIN SCIENCES

MIND MEETING

Seminar Series

2021

All welcome!
Attendance is free

20 May

11 am online talk via Zoom
please contact **psy-office@cbs.mpg.de** for login details

Christopher Summerfield

University of Oxford
UK

Relational knowledge representation and assembly in humans and neural networks

Humans represent complex knowledge structures and use them for inference. I will describe experiments involving human behavioural testing, modelling, and brain imaging that use transitive inference as a paradigm for studying relational knowledge representation. I will show evidence that humans use neural representations of number, lying on a low-dimensional neural manifold, as a scaffold for learning novel transitive series. I will show that when transitive series are learned in different contexts, the neural representations align in a way that facilitates cross-context generalisation. The behaviour and neural representations observed in humans closely match those seen in neural networks trained to perform the same task. Finally, I will show that a brief training instance can allow neural knowledge assembly, whereby two existing existing transitive structures are rapidly linked into a single line, and that this is paralleled by fast changes in neural geometry in the human parietal cortex. Finally we propose a neural network account of how this knowledge assembly occurs.

www.cbs.mpg.de
theves@cbs.mpg.de
doellerlab.com
@doellerlab

Organizers:
Stephanie Theves
Christian Doeller

Max Planck Institute
for Human Cognitive and Brain Sciences
Department of Psychology
Stephanstr. 1A | 04103 Leipzig