

Anna E. Karlsson, PhD

PROFESSIONAL APPOINTMENTS

Postdoctoral Researcher | Glasgow | May 2026 – ongoing

Neurotechnology, Cognition and Oscillations Lab, School of Psychology and Neuroscience, University of Glasgow

Advisor: Prof. Dr. Simon Hanslmayr

- How are memories of different level of detail encoded and retrieved and how do these levels of representation interact in support of episodic memory?
- High-resolution fMRI to examine the distinct contributions of hippocampal subfields and their interaction with cortical regions.

Postdoctoral Researcher | Berlin | June 2022 – Dec 2024

Cabecalab, Department of Psychology, Humboldt-Universität zu Berlin

Advisor: Prof. Dr. Roberto Cabeza

- Investigated the neural mechanisms of memory representation and binding across the adult lifespan.
- Designed and implemented studies using fMRI, EEG, and behavioural tasks to assess memory for semantic, perceptual, and contextual detail.

Pre-Doctoral Researcher | Berlin | Mar 2017 – May 2022

Center for Lifespan Psychology, Max Planck Institute for Human Development

Advisors: Dr. Myriam C. Sander, Prof. Dr. Ulman Lindenberger

- Doctoral thesis: "Neural oscillations shape the quality and content of memory throughout the lifespan" (defended May 2022, *Magna cum laude*).
- Member of the *Cognitive and Neural Dynamics Across the Lifespan (ConMem)* project & the *Minerva Research Group, Lifespan Changes in Memory Representations (LIME)*
- Independently designed and executed a large-scale, multimodal (EEG/fMRI/eye-tracking) study on aging and memory.

Care Assistant | Malmö, Sweden | June 2006 – Dec 2016

- Gained extensive firsthand insight into age-related cognitive decline and memory impairments in normal and clinical aging populations.
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EDUCATION

PhD in Psychology | Mar 2017 – Dec 2021

International Max Planck Research School on the Life Course (LIFE)

Max Planck Institute for Human Development & Humboldt University, Berlin

MSc in Psychology | Lund University, Sweden | Sep 2014 – Sep 2016

Advisor: Prof. Mikael Johansson

Thesis: Electrophysiological correlates of episodic memory are material sensitive (Pass with Distinction)

BSc in Psychology | Lund University, Sweden | Jan 2011 – Feb 2014

Advisor: Prof. Mikael Johansson

Thesis: Episodic memory retrieval: An ERP study (Pass with Distinction)

PUBLICATIONS

Peer-Reviewed Journal Articles

1. **Karlsson, A. E.**, Lindenberger, U., & Sander, M. C. (2022). Out of rhythm: Compromised precision of theta-gamma coupling impairs associative memory in old age. *Journal of Neuroscience*. <https://doi.org/10.1523/JNEUROSCI.1678-21.2021>
2. **Karlsson, A. E.**, & Sander, M. C. (2022). Altered alpha/beta desynchronization during item-context binding contributes to the associative deficit in older age. *Cerebral Cortex*. <https://doi.org/10.1093/cercor/bhac219>
3. **Karlsson, A. E.**, Wehrspaun, C., & Sander, M. C. (2020). Item recognition and lure discrimination in younger and older adults are supported by alpha/beta desynchronization. *Neuropsychologia*. <https://doi.org/10.1016/j.neuropsychologia.2020.107658>
4. Naspi, L., Stensholt, C., **Karlsson, A. E.**, Monge Z. A., & Cabeza, R. (2023). Effects of aging on successful object encoding: Enhanced semantic representations compensate for impaired visual representations. *Journal of Neuroscience*. <https://doi.org/10.1523/JNEUROSCI.2265-22.2023>
5. Pauley, C., **Karlsson, A. E.**, & Sander, M. C. (2024). Early visual cortices reveal interrelated item and category representations in aging. *eNeuro*. <https://doi.org/10.1523/ENEURO.0337-23.2023>

6. Bramaio, I., **Karlsson, A. E.**, & Johansson, M. (2017). Mental reinstatement of encoding context improves episodic remembering. *Cerebral Cortex*.

<https://doi.org/10.1016/j.cortex.2017.06.007>

Manuscripts in Preparation

- **Karlsson, A. E.**, Pauley, C., & Sander, M. C. Context reactivation in CA1 predicts associative memory success across the adult lifespan. (Data analysis finalized).
- **Karlsson, A. E.**, Sommer, V., & Sander, M. C. Losing the details: Alpha/Beta desynchronization links neural dedifferentiation to age differences in memory specificity. (Data analysis finalized).

INVITED TALKS & SYMPOSIA

Invited Talks

- Department of Lifespan Psychology, Max Planck Institute for Human Development. (Feb 2025). "Reduced memory specificity in older age is linked to altered alpha/beta desynchronization."
- Department of Lifespan Psychology, Max Planck Institute for Human Development. (Mar 2024). "Context reactivation in CA1 is linked to age differences in associative memory."
- Memory Monthly Meetings (International Consortium). (Feb 2022). "Imprecise theta-gamma coupling underlies age differences in associative memory."
- Psychologie und Gehirn (PuG) Symposium. (Jun 2021). "Imprecise theta-gamma coupling underlies age differences in associative memory."

Organized Symposium

- "Neural underpinnings of episodic memory: a focus on the formation and retrieval of contextual memories." International Conference of Cognitive Neuroscience (ICON). (May 2022).
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CONFERENCE PRESENTATIONS *(Selected)*

- **Karlsson, A. E.**, Pauley, C., & Sander, M. C. (2024). Context reactivation in CA1 is linked to age differences in object-context associations. *Cognitive Neuroscience Society (CNS)*; last minute cancellation for personal reasons).
 - **Karlsson, A. E.**, Pauley, C., Cabeza, R., & Sander, M. C. (2023). Age differences in contextual binding. *Cognitive Neuroscience Society (CNS)*.
 - **Karlsson, A. E.**, & Sander, M. C. (2021). Theta-gamma coupling during item-context binding in younger and older adults. *CNS (Virtual)*.
 - **Karlsson, A. E.**, & Sander, M. C. (2019). Theta power supports episodic memory formation in younger and older adults. *Psychologie und Gehirn*.
 - **Karlsson, A. E.**, & Sander, M. C. (2019, June). Theta power supports episodic memory formation in younger and older adults. *Psychologie und Gehirn, Dresden*.
 - **Karlsson, A. E.**, & Sander, M. C. (2019, May). Does context shape older adults' memories less than in younger adults? MPG NeuroRetreat, Max-Planck-Gesellschaft, München.
 - **Karlsson, A. E.**, & Sander, M. C. (2019, January). Do subsequent memory effects on theta power relate to age differences in context reinstatement? Dallas Aging and Cognition Conference, TX, USA.
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MENTORING & SUPERVISION

- **Claire Pauley** (Master's Student). *Effects of contextualization on the similarity of memory representations*. (Co-supervisor, 2019-2020).
 - **Fitore Morina** (Master's Student). *Differences in oscillatory mechanisms of episodic memory formation in younger and older adults*. (Co-supervisor, 2019-2020).
 - **Nele Westermann** (Bachelor's Student). *Age differences in the subsequent memory effect: An ERP study*. (Co-supervisor, 2019).
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METHODOLOGICAL SKILLS

Neuroimaging & Methods: EEG, high-resolution & standard fMRI, Eye Tracking, Hippocampal Subfield Segmentation.

- Developed a novel, high-resolution multi-band sequence
- Scanner operator training (MPIB 2017, 2022)

Analytical Skills: Time-Frequency Analysis, Phase-Amplitude Coupling, Circular Statistics, Multivariate Pattern Analysis (RSA), Hierarchical Bayesian Modelling, Single-Trial Analysis, Deep Neural Networks.

Programming & Software: **MatLab** (Fluent), **Python** (Experienced), **R** (Proficient), Shell/Unix (Experienced); FieldTrip, EEGLab, SPM, FSL, ANTs, PsychToolbox, fmriPrep, eyelink

PROFESSIONAL SERVICE & TRAINING

Peer Reviewed for: *Neuropsychologia*, *Journal of Cognitive Neuroscience*, *Cerebral Cortex*, *Brain and Cognition*, *BioPsychology*, *PLOS Biology*.

Selected Workshops: Hippocampal Subfield Segmentation (MPIB, 2023), Bayesian Hierarchical Modelling (MPIB, 2020), *Context & Episodic Memory Symposium (CEMS; virtual, 2020)*, Analysis of Functional MRI Data (MPIB, 2018), *Hippocampal Network Across the Lifespan (H-NET; Budapest, 2018)*

Training of students: Data collection (incl. EEG, MRI, cognitive measures, eye-tracking, and behavioral measures), data preprocessing (EEG, s/fMRI) and simple analyses (ERPs, behavioral data). Held workshop and training sessions in hippocampal subfield segmentation in the Cabezalab.

In-house talks: Center for Lifespan Psychology (LIP) Internal Colloquium, (Dec 2017, May 2019, Mar 2020, Sep 2020, May 2021), Max-Planck Dahlem Campus of Cognition workshop (MPDCC; Sep 2023, Oct 2024).

Academy talks (graduate school, LIFE): Zurich (2017, 2019), Virginia (US; 2018), Michigan (US; 2017).

Seminars (graduate school, LIFE): *Learning, Memory, and Forgetting From a Lifespan Perspective* (2017), *The Evolutionary Social Sciences: Theoretical Foundations* (2017), *Rhythms of the Brain* (2018), *Chalk Talk: Fellows Project Presentations* (2018).