



## Dr. Nora Alicia Herweg

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### Academic history

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|--------------------------|---|
| <b>11/2020 – present</b> | <b>Postdoctoral researcher</b><br>Institute of Cognitive Neuroscience, Department of Psychology, Ruhr University Bochum, Germany<br>PI: Prof. Dr. Nikolai Axmacher  |
| <b>01/2017 – 10/2020</b> | <b>Postdoctoral researcher</b><br>Computational Memory Lab, Department of Psychology, University of Pennsylvania, PA, USA<br>PI: Prof. Dr. Michael J Kahana   |
| <b>11/2013 – 04/2017</b> | <b>PhD student</b><br>Department of Systems Neuroscience, University Medical Center Hamburg Eppendorf, Germany<br>Dissertation: <i>“Memory and the dopaminergic system: Neural mechanisms and modulatory variables”</i><br>PI: Prof. Dr. Nico Bunzeck |
| <b>04/2015 – 06/2015</b> | <b>Visiting researcher</b><br>Cognition and Brain Plasticity Unit, Institute of Biomedical Research of Bellvitge, Barcelona, Spain<br>PI: Prof. Dr. Lluís Fuentemilla   |
| <b>09/2008 – 10/2013</b> | <b>B.Sc. and M.Sc. in Psychology</b><br>University of Bonn, Germany   |

### Grants and fellowships

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| <b>01/2019 &amp; 02/2022</b> | <b>Cosyne travel grant</b>                                      |
| <b>07/2018</b>               | <b>DFG Postdoctoral fellowship (awarded for 2 yr.)</b>          |
| <b>06/2016</b>               | <b>University of Hamburg PhD fellowship (awarded for 1 yr.)</b> |

05/2015

**Fellowship from the G.A.-Lienert foundation**  
for a 3 months visit at the Institute of Biomedical  
Research of Bellvitge, Barcelona, Spain

### Working papers

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Rudoler, J. H., **Herweg, N. A.**, & Kahana, M. J. (2022). Hippocampal theta and episodic memory. *bioRxiv*.

Schonhaut, D.R., Ramayya, A.G., Solomon, E.A., **Herweg, N.A.**, Fried, I., & Kahana, M.J. (2020). Single neurons throughout human memory regions phase-lock to hippocampal theta. *bioRxiv*.

**Herweg, N.A.**, Kunz, L., Brandt, A., Wanda, P.A., Sharan, A.D., Sperling, M.R., ... & Kahana, M.J. (2020). A learned map for places and concepts in the human MTL. *bioRxiv*.

### Publications

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Kunz, L., Brandt, A., Reinacher, P. C., Staesina, B. P., Reifstein, E. T., Weidemann, C. T., **Herweg, N. A.**, Patel, A., Tsitsiklis, M., Kempter, R., Kahana, M. J., Schulze-Bonhage, A. & Jacobs, J. (2021). A neural code for egocentric spatial maps in the human medial temporal lobe. *Neuron*, 109(17), 2781-2796.

Rubinstein, D. Y., Camarillo-Rodriguez, L., Serruya, M. D., **Herweg, N. A.**, Waldman, Z. J., Wanda, P. A., Sharan, A. D., Weiss, S. A. & Sperling, M. R. (2021). Contribution of left supramarginal and angular gyri to episodic memory encoding: an intracranial EEG study. *Neuroimage*, 225, 117514.

**Herweg, N.A.**, Sharan, A.D., Sperling, M.R., Brandt, A., Schulze-Bonhage, A., & Kahana, M.J. (2020). Reactivated spatial context guides episodic recall. *Journal of Neuroscience*, 40(10), 2119-2128.

**Herweg, N.A.\***, Solomon, E.A.\*, & Kahana, M.J. (2020). Theta oscillations in human memory. *Trends in Cognitive Sciences*, 24(3), 208-227.

Guran, C.N.A., **Herweg, N.A.**, & Bunzeck, N. (2019). Age-related decreases in the retrieval practice effect directly relate to changes in alpha-beta oscillations. *Journal of Neuroscience*, 39(22), 4344-4352.

Steiger, T.K., **Herweg, N.A.**, Menz, M.M., & Bunzeck, N. (2019). Working memory performance in the elderly relates to theta-alpha oscillations and is predicted by parahippocampal and striatal integrity. *Scientific Reports*, 9(1), 706.

**Herweg, N.A.** & Kahana, M.J. (2018). Spatial representations in the human brain. *Frontiers of Human Neuroscience*, 12.

**Herweg, N.A.**, Sommer, T. & Bunzeck, N. (2018). Retrieval demands adaptively change striatal old/new signals and boost subsequent long-term memory. *Journal of Neuroscience*, 38, 745-754.

Eckart, C.\*, Woźniak-Kwaśniewska, A.\*, **Herweg, N.A.**, Fuentemilla, L., Bunzeck, N. (2016). Acetylcholine modulates human working memory and subsequent familiarity based recognition via alpha oscillations. *NeuroImage*, 137, 61-69.

**Herweg, N.A.\***, Apitz, T.\*, Leicht, G., Mulert, C., Fuentemilla, L. & Bunzeck, N. (2016). Theta-alpha oscillations bind the hippocampus, prefrontal cortex, and striatum during recollection: Evidence from simultaneous EEG-fMRI. *Journal of Neuroscience*, 36(12), 3579-3587.

**Herweg, N.A.** & Bunzeck, N. (2015). Differential effects of white noise in cognitive and perceptual tasks. *Frontiers in Psychology*, 6.

**Herweg, N.A.**, Weber, B., Kasparbauer, A., Meyhöfer, I., Steffen, M., Smyrnis, N., Ettinger, U. (2014). Functional magnetic resonance imaging of sensorimotor transformations in saccades and antisaccades. *NeuroImage*, 102, 848-860.

### Conference presentations

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**Herweg, N.A.**, Stawarczyk, D., Schulze-Bonhage, A., Kunz, L.\* & Axmacher, N.\* (2022). Theta oscillations support map-based navigation. Talk at the Conference of Experimental Psychologists (TeaP), March 20-23, virtual.

**Herweg, N.A.** & Kahana, M.J. (2022). A temporal context model of spatial memory. Talk at the annual Cosyne meeting, March 17-20, Lisbon, Portugal.

**Herweg, N.A.**, Wanda, P.A., Kunz, L., Brandt, A., Sperling, M.R., Sharan, A.D., Schulze-Bonhage, A., Kahana, M.J. (2020). Multi-unit activity in human MTL reflects retrieval of spatial and temporal context. Talk at the Context and Episodic Memory Symposium, August 17-19, virtual.

**Herweg, N.A.**, Wanda, P.A., Kunz, L., Brandt, A., Sperling, M.R., Sharan, A.D., Schulze-Bonhage, A., Kahana, M.J. (2020). MTL multi-unit activity reflects retrieval of spatial and temporal context. Poster at the Annual Meeting of the Cognitive Neuroscience Society, May 2-5, virtual.

**Herweg, N.A.**, Wanda, P.A., Kunz, L., Brandt, A., Sperling, M.R., Sharan, A.D., Schulze-Bonhage, A., Kahana, M.J. (2019). Decoding spatial information from local field potentials in the human MTL. Talk at the satellite workshops of the Bernstein conference, September 17-20, Berlin, Germany.

**Herweg, N.A.**, Wanda, P.A., Kunz, L., Brandt, A., Sperling, M.R., Sharan, A.D., Schulze-Bonhage, A., Kahana, M.J. (2019). Decoding spatial information from local field potentials in the human MTL. Poster at the Context and Episodic Memory Symposium, May 13-14, Philadelphia, PA, USA.

**Herweg, N.A.**, Wanda, P.A., Kunz, L., Brandt, A., Sperling, M.R., Sharan, A.D., Schulze-Bonhage, A., Kahana, M.J. (2019). Distinct location and goal representations in the human MTL guide navigation. Poster at the annual Cosyne meeting, February 28 – March 3, Lisbon, Portugal.

**Herweg, N.A.**, Wanda, P.A., Kunz, L., Brandt, A., Sperling, M.R., Sharan, A.D., Schulze-Bonhage, A., Kahana, M.J. (2018). Decoding spatial information from local field potentials in the human MTL. Talk at the Annual Meeting of the Society for Neuroscience, November 3-7, San Diego, CA, USA.

**Herweg, N.A.**, Sharan, A.D., Sperling, M.A., Brandt, A., Schulze-Bonhage, A., Kahana, M.J. (2018). Reinstatement of spatial information in a hybrid spatial-episodic memory task. Poster at the Annual Meeting of the Cognitive Neuroscience Society, March 23-26, Boston, MA, USA.

**Herweg, N.A.**, Johri, A., Sperling, M.A., Brandt, A., Schulze-Bonhage, A., Kahana, M.J. (2017). Neural correlates of contextual retrieval in a hybrid spatial-episodic memory task. Poster at the Psychonomics conference, November 9-12, Vancouver, BC, Canada.

**Herweg, N.A.**, Sommer, T. & Bunzeck, N. (2016). Striatal novelty responses reverse with retrieval demands. Poster at the Annual Meeting of the Society for Neuroscience, November 12-16, San Diego, CA, USA.

**Herweg, N.A.**, Sommer, T. & Bunzeck, N. (2016). Encoding vs. retrieval mode modulates subsequent memory for scene images. Poster at the International Conference on Memory, July 17-22, Budapest, Hungary.

**Herweg, N.A.**, Apitz, T., Leicht, G., Mulert, C., Fuentemilla, L. & Bunzeck, N. (2015). Theta-alpha oscillations bind the hippocampus, prefrontal cortex, and striatum during recollection: Evidence from simultaneous EEG-fMRI. Poster at the Annual Meeting of the Society for Neuroscience, October 17-21, Chicago, IL, USA.

**Herweg, N.A.**, Weber, B., Kasparbauer, A., Meyhöfer, I., Steffen, M., Smyrnis, N., Ettinger, U. (2014). Functional Magnetic Resonance Imaging of Sensorimotor Transformations in Saccades and Antisaccades. Poster at the psychology and brain conference (PUG), June 19-21, Luebeck, Germany.

\*equal contributions

Bochum, March 25, 2022