

University of Hamburg, Institute of Psychology
Chair of "Mechanisms of Learning and Change"
Von-Melle-Park 5, D-20146 Hamburg, Germany

+49 (0)40 42838-5346

✉ lennart.wittkuhn@uni-hamburg.de

🌐 lennartwittkuhn.com

🐙 github.com/Innrtwttkhn

🐦 twitter.com/Innrtwttkhn

📄 fediscience.org/@Innrtwttkhn

Dr. Lennart Wittkuhn

Postdoctoral Researcher & Lab Manager

Last update: May 2023
(click to open hyperlinks)

📅 Professional Appointments

Current position

since 04/23 **Postdoctoral Researcher & Lab Manager**, University of Hamburg, Germany

🏠 Chair for "Mechanisms of Learning and Change" (PI: Prof. Dr. Nicolas Schuck)

☰ I investigate neural replay in the human brain using fMRI as a PostDoc and manage core research infrastructure and lab resources (code, data, docs) as a Lab Manager

Previous positions

10/22–03/23 **Postdoctoral Researcher**, Max Planck Institute for Human Development, Berlin

🏠 Max Planck Research Group "NeuroCode" (PI: Prof. Dr. Nicolas Schuck)

🏠 Max Planck UCL Centre for Computational Psychiatry and Ageing Research, Berlin

☰ Continuation of my work on investigating replay in the human brain using fMRI

01/22–09/22 **Affiliated Researcher**, Max Planck Institute for Human Development, Berlin

🏠 Max Planck Research Group "NeuroCode" (PI: Prof. Dr. Nicolas Schuck)

🏠 Max Planck UCL Centre for Computational Psychiatry and Ageing Research, Berlin

☰ Continuation of my work on investigating replay in the human brain using fMRI

10/17–12/21 **Pre-doctoral research fellow**, Max Planck Institute for Human Development, Berlin

🏠 Max Planck Research Group "NeuroCode" (PI: Prof. Dr. Nicolas Schuck)

📖 Dissertation work: The main goal of my dissertation was to investigate neural replay of task representations and its role in learning and planning in the human brain using fMRI

04/13–09/17 **Research assistant**, Technische Universität Dresden, Germany

🏠 Chair of Lifespan Developmental Neuroscience (PI: Prof. Shu-Chen Li, Ph.D.)

☰ I conducted various behavioral, EEG, TMS and tDCS studies with different age groups, analyzed data using MATLAB, R and SPSS and recruited study participants

Spring 2017 **Research intern**, Concordia University Montreal, Canada

🏠 Department of Psychology (PI: Prof. Ben Eppinger)

☰ I programmed a behavioral task using MATLAB (with PsychToolbox) to investigate adaptive decision-making in dynamic environments and analyzed the behavioral data using MATLAB and R

Summer 2016 **Clinical intern**, Charité University Hospital Berlin, Germany

🏠 Department of Clinical Neuropsychology (Head: Dr. Ute Kopp)

☰ I conducted neuropsychological examinations (e.g., memory and executive functions) with neurology patients (e.g., with Parkinson's disease and dementia) and wrote medical reports

Spring 2015 **Research intern**, University College London, United Kingdom
🏠 Affective Brain Lab (PI: Tali Sharot, Ph.D.; supervised by Neil Garrett, Ph.D.)
☰ I programmed two behavioral tasks using MATLAB (with Cogent 2000) to investigate risky decisions, collected and analyzed behavioral and skin conductance response data

🎓 Education

Postgraduate education

10/17–04/22 **Dr. rer. nat. (Ph.D.) in Psychology / Cognitive Neuroscience**, Max Planck Institute for Human Development, Berlin (MPIB) & Freie Universität (FU) Berlin

📖 Thesis: “Investigating neural replay of task representations in the human brain using fMRI”

🌟 Grade: summa cum laude (“with highest honor”)

🔗 doi: 10.17169/refubium-34672

👤+ Advisors: Prof. Dr. Nicolas Schuck (MPIB) & Prof. Radoslaw M. Cichy (FU Berlin)

10/17–04/22 **Pre-doctoral research fellow**, Max Planck Institute for Human Development, Berlin

🏠 International Max Planck Research School on Computational Methods in Psychiatry and Ageing Research (IMPRS COMP2PSYCH) at the Max Planck UCL Centre for Computational Psychiatry and Ageing Research, Berlin

10/15–09/17 **M.Sc. in Cognitive-Affective Neuroscience**, Technische Universität Dresden

📖 Thesis: “Inferring changes in latent states in dynamic environments”

🌟 Grade: 1.2 (very good; roughly equivalent to A- / GPA of 3.7)

👤+ Advisors: Prof. Ben Eppinger, Prof. Hauke Heekeren, M.Sc. Rasmus Bruckner

Undergraduate education

10/12–09/15 **B.Sc. in Psychology**, Technische Universität Dresden

📖 Thesis: “Effects of age and prefrontal rTMS on learning to predict future reward”

🌟 Grade: 1.3 (very good; roughly equivalent to A- / GPA of 3.7)

👤+ Advisors: Prof. Ben Eppinger, Prof. Shu-Chen Li

Specialized training and educational courses

02/2020 **Workshop “A Reproducible Data Analysis Workflow”**,

📍 Max Planck Institute for Human Development, Berlin, Germany

☑️ Full-day workshop on reproducible data analyses with R Markdown, Git, Make, and Docker

11/2019 **Symposium “Doing Good–Scientific Practice under Review”**,

📍 Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany

☑️ 2-days symposium on good scientific practices and open science

08/2019 **Summer school on Methods in Neuroscience at Dartmouth (MIND)**,

📍 Dartmouth College, Hanover, New Hampshire, USA

☑️ 10-days computational neuroscience summer school on “cognitive maps”

06/2019 **Hackathon at the Organization for Human Brain Mapping Meeting 2019**,

📍 Auditorium Parco Della Musica, Rome, Italy

☑️ 3-days neuroinformatics hackathon, before the OHBM Annual Meeting 2019

Publications

Preprints

2022 **Wittkuhn, L.**, Krippner, L. M., & Schuck, N. W. (2021) Statistical learning of successor representations is related to on-task replay. *bioRxiv*. doi: 10.1101/2022.02.02.478787

Peer-reviewed journal articles

2021 **Wittkuhn, L.**, Chien, S., Hall-McMaster, S., & Schuck, N. W. (2021) Replay in minds and machines. *Neuroscience & Biobehavioral Reviews* (129), 367-388. doi: 10.1016/j.neubiorev.2021.08.002

2021 **Wittkuhn, L.**, & Schuck, N. W. (2021) Dynamics of fMRI patterns reflect sub-second activation sequences and reveal replay in human visual cortex. *Nature Communications* (12), 1795. doi: 10.1038/s41467-021-21970-2

2018 **Wittkuhn, L.**, Eppinger, B., Bartsch, L. M., Thurm, F., Korb, F. M., & Li, S.-C. (2018) Repetitive transcranial magnetic stimulation over dorsolateral prefrontal cortex modulates value-based learning during sequential decision-making. *NeuroImage* (176), 384-395. doi: 10.1016/j.neuroimage.2017.11.057

Conference proceedings

















2019 **Wittkuhn, L.**, & Schuck, N. W. (2019) Detecting sub-second activation sequences with sequential fMRI pattern analysis. *2019 Conference on Cognitive Computational Neuroscience, 13–16 September 2019, Berlin, Germany*. doi: 10.32470/CCN.2019.1253-0

Conference presentations and posters

- 06/2021 **Psychologie und Gehirn (PuG) 2021**,  Online
 Poster: “Dynamics of fMRI patterns reflect sub-second activation sequences and reveal replay in human visual cortex” + Authors: Wittkuhn, L., & Schuck, N. W.
- 09/2019 **Conference on Cognitive Computational Neuroscience (CCN)**,  TU Berlin
 Poster: “Detecting sub-second activation sequences with sequential fMRI pattern analysis”
+ Authors: Wittkuhn, L., & Schuck, N. W.
- 06/2019 **Organization for Human Brain Mapping (OHBM) Annual Meeting 2019**,
 Auditorium Parco della Musica, Rome, Italy
 Poster: “Detecting fast sub-second activation sequences with sequential fMRI pattern analysis”
+ Authors: Wittkuhn, L., & Schuck, N. W.
- 05/2019 **Royal Society: “Memory reactivation: replaying events past, present and future”**,
 Kavli Royal Society Centre, Newport Pagnell, United Kingdom
 Poster: “Tracking fast sequential neural events in humans using sequential fMRI pattern analysis” + Authors: Wittkuhn, L., & Schuck, N. W. (presented by Schuck, N. W.)
- 09/2018 **Replay @ CUBRIC**,  CUBRIC, Cardiff, United Kingdom
 Poster and talk: “Tracking fast sequential neural events in humans using fMRI”
+ Authors: Wittkuhn, L., & Schuck, N. W.







Talks

About my research

- 11/2022 **General Psychology Lab**, PI: Sebastian Gluth,  University of Hamburg, Germany
 Talk: "Investigating replay of task representations in the human brain using fMRI" (online)
- 03/2022 **Center for Mind/Brain Sciences**, PI: Roberto Bottini,  University of Trento, Italy
 Talk: "Investigating replay of task representations in the human brain using fMRI" (online)
- 08/2021 **Physiology of Action Lab**, PI: Valeria Della-Maggiore,  University of Buenos Aires
 Talk: "Dynamics of fMRI patterns reflect sub-second activation sequences and reveal replay in human visual cortex" (online)
- 01/2021 **Learning, Memory & Decision Lab**, PI: Matthew Nassar,  Brown University, USA
 Talk: "Dynamics of fMRI patterns reflect sub-second activation sequences and reveal replay in human visual cortex" (online)
- 01/2021 **COMP2PSYCH Doctoral Colloquium**,  Max Planck UCL Centre for Computational Psychiatry and Ageing Research, Berlin, Germany
 Talk: "Dynamics of fMRI patterns reflect sub-second activation sequences and reveal replay in human visual cortex"
- 11/2018 **Research colloquium**,  Max Planck Institute Human Development, Berlin, Germany
 Talk: "Tracking fast sequential replay events in humans using fMRI"
- 09/2018 **Symposium on Computational Psychiatry and Ageing Research**,  Max Planck UCL Centre for Computational Psychiatry and Ageing Research, Tegernsee, Germany
 Talk: "Tracking fast neural replay events in humans using fMRI"
- 11/2017 **COMP2PSYCH Fall Academy 2017**,  Max Planck UCL Centre for Computational Psychiatry and Ageing Research, Berlin, Germany
 Talk: "Tracking fast sequential replay events in humans using fMRI"

About open science, reproducibility and research data management

- 05/2023 **Symposium on "Reproducible Research: Education and Teaching Formats Reports From the Reproducibility Networks"**,  QUEST Center, Berlin, Germany
 Talk: "A full-semester course on 'Version control of code and data using Git and DataLad'"
 doi: 10.5281/zenodo.7926692
- 04/2023 **Department of Education & Psychology**,  Freie Universität Berlin, Germany
 Talk: "Open and reproducible data management with DataLad" (online)
 doi: 10.5281/zenodo.5012476
- 01/2023 **Open Science Initiative Psychology (OSIP)**,  Technische Universität Dresden, Germany
 Talk: "Tools for an open and reproducible research workflow" (online)
 doi: 10.5281/zenodo.7554142
- 09/2022 **5th Research Data Management Workshop 2022**,  Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany
 Talk: "Tools for an open and reproducible research workflow" (hybrid)
 doi: 10.5281/zenodo.7075084

- 10/2021 **Lifespan Neural Dynamics Group**, PI: Douglas Garrett, 📍 MPI for Human Development
 Talk: “A research workflow with DataLad” (online)
 doi: 10.5281/zenodo.5012477
- 10/2021 **Open Science Ambassadors Day 2021**, 📍 Max Planck PhDnet & Digital Library
 Talk: “Tools for an open and reproducible workflow” (online)
 doi: 10.5281/zenodo.5575219
- 06/2021 **Max Planck Digital Library**, 📍 Max Planck Society, Munich, Germany
 Talk: “Towards a workflow for open and reproducible MRI studies” (online)
 doi: 10.5281/zenodo.5012477

Awards, funding and fellowships

Funding

- 2023–2024 **Digital and Data Literacy in Teaching Lab grant**, awarded by the Digital and Data Literacy in Teaching Lab (DDLitLab) initiative at the University of Hamburg (role: PI) 50,000 € funding for a course on “Version control of code and data using Git and DataLad”

Fellowships

- 2020–2021 **ReproNim/INCF Training Fellowship**, awarded by the Center for Reproducible Neuroimaging Computation and International Neuroinformatics Coordinating Facility Full year Train-the-Trainer fellowship program which provides fellows with conceptual and practical training in reproducible neuroimaging

Travel stipends

- 2019 **DAAD travel stipend**, awarded by the German Academic Exchange Service for my conference trip to the OHBM Annual Meeting 2019 in Rome, Italy
- 2017 **DAAD PROMOS stipend**, awarded by the German Academic Exchange Service for my research visit to the Department of Psychology at Concordia University Montreal
- 2015 **Erasmus+ stipend**, awarded by the Saxon Erasmus+ Internship Consortium for my research visit to the Affective Brain Lab at University College London

Skills

- Coding Python, R, MATLAB, Bash
- Development Git (GitHub, GitLab), DataLad, high-performance computing (Slurm, Torque), software containers (Docker, Singularity), continuous integration (Travis, GitLab CI, GitHub Actions)
- Data Analysis Nipype, NiLearn, scikit-learn, SPM12, fMRIPrep, MRIQC, Brain Imaging Data Structure
- Task Design PsychoPy (Python), PsychToolbox & Cogent 2000 (MATLAB)
- Methods functional and structural magnetic resonance imaging, online behavioral studies (Prolific, Pavlovia), electroencephalography, skin conductance response measurement, transcranial magnetic stimulation, transcranial direct-current stimulation
- Writing \LaTeX , Markdown, MS Office
- Design Adobe Photoshop, Adobe Illustrator, Affinity Designer
- Languages German (native), English (fluent), French (basic)

Teaching

- 06/2021 **Git Workshop “Git for Scientists”**, Max Planck Research Group NeuroCode
Half-day online workshop on version control using Git (with Christoph Koch & Ondrej Zika)
- 10/2020 **Data Management Workshop with DataLad**, for MPIB / FZ Jülich (online)
Full-day online workshop on data management using DataLad (with Adina Wagner)
Links to: [Workshop Website](#) — [Workshop recordings on YouTube](#)
- 12/2019 **Introduction to git**, Max Planck Institute for Human Development
Hands-on introductory workshop on the version-control system git
- 07/2019 **Introduction to fMRIPrep**, Lab of Christian Doeller
Introductory tutorial how to run fMRIPrep for pre-processing fMRI data
- Winter 18/19 **fMRI data analysis and pre-processing**, MPI for Human Development
I organized and partly taught a weekly meeting on fMRI data analysis and data pre-processing

Professional memberships

- 2019–2020 Organization for Human Brain Mapping (OHBM)

Media coverage

- 11/2019 **“Neuroplastizität: Wie das Gehirn sich neu strukturiert”**, *Bayern 2*
Rebroadcast of the radio podcast featuring our work on replay in humans (in German)
- 11/2018 **“Kommandozentrale Gehirn”**, *Bayerischer Rundfunk (Bayern 2)*, *radioWissen*
Radio podcast featuring our work on replay in humans (in German)

Mentoring and supervision

Research assistants

- 2019 – 2020 **Sudeshna Bora**, *Masters’s student*, Computational Neuroscience
- 2019 – 2020 **Lena Krippner**, *Masters’s student*, Berlin School of Mind and Brain
- 2018 – 2020 **Anika Löwe**, *Masters’s student*, Social, Cognitive and Affective Neuroscience

Interns

- 2019 **Leonardo Pettini**, *Masters’s student*, Berlin School of Mind and Brain
Now: PhD candidate at the Max Planck School of Cognition, Berlin, Germany
- 2018 **Lion Schulz**, *Bachelor’s student*, Technische Universität Dresden
Now: PhD candidate at the Department Computational Neuroscience, Max Planck Institute for Biological Cybernetics, Tübingen, Germany

🌐 Professional services and extracurricular activities

- since 10/2022 **Member of the Institutional Review Board (IRB)**, MPI for Human Development
I contribute to the ethics committee that reviews proposals for research involving human subjects
- since 01/2021 **Member of Research Data Management group**, MPI for Human Development
I contribute to the institutionalized, cross-departmental management of research data
- 2019–2022 **PhD wiki administrator**, MPI for Human Development
I created and since maintain a `git`-based wiki for PhD students

” References

Prof. Dr. Nicolas Schuck, *PhD advisor*

Principal Investigator of the Max Planck Research Group NeuroCode
Max Planck Institute for Human Development, Lentzeallee 94, 14195 Berlin, Germany
Professor of Psychology (Chair of “Mechanisms of Learning and Change”)
University of Hamburg, Von-Melle-Park 5, 20146 Hamburg, Germany
✉ schuck@mpib-berlin.mpg.de / nicolas.schuck@uni-hamburg.de

Prof. Dr. Ben Eppinger, *Bachelor's and Master's advisor*

Associate Professor at the Department of Psychology
Concordia University Montreal, Loyola Campus
Montreal, Quebec, Canada H4B1R6
✉ ben.eppinger@concordia.ca

Prof. Shu-Chen Li, Ph.D., *Bachelor's advisor*

Professor at the Chair of Lifespan Developmental Neuroscience
Technische Universität Dresden
Zellescher Weg 17, 01062 Dresden, Germany
✉ shu-chen.li@tu-dresden.de

Univ.-Prof. Dr. Hauke Heekeren, *Master's advisor*

President of the University of Hamburg
Mittelweg 177, Raum N 5026, 20148 Hamburg, Germany
✉ praesident@uni-hamburg.de