

# Dr. Sandra Martin

## ACADEMIC APPOINTMENTS

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### Postdoctoral Researcher

since 09/2023

*MPI for Human Cognitive and Brain Sciences,*

*Lise Meitner Research Group Cognition and Plasticity*

Project: Contribution of cognitive control resources to natural language comprehension across the adult life span (DFG-funded project in collaboration with University of Lübeck)

Advisers: Prof. Dr. Gesa Hartwigsen (MPI CBS), Prof. Dr. Jonas Obleser (University of Lübeck)

## EDUCATION

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### Dr. rer. med. in Cognition and Neuroscience (PhD)

2018–2023

*MPI for Human Cognitive and Brain Sciences Leipzig, Germany*

*Lise Meitner Research Group Cognition and Plasticity &*

*University Hospital Leipzig, Language and Aphasia Lab*

Supervisors: Prof. Dr. Gesa Hartwigsen, Prof. Dr. Dorothee Saur

Thesis title: The aging brain in semantic cognition—Insights from fMRI and TMS

### M.Sc. in Clinical Linguistics

2012–2014

*University of Potsdam, Germany*

*University of Groningen, The Netherlands*

Supervisors: PD Dr. Frank Burchert, Prof. Dr. Agnes Flöel

Thesis: Improving communication in aphasia: A comparison of naming- and discourse-based treatment, both facilitated by transcranial direct current stimulation

Grade: Excellent

### B.A. in Linguistics and Roman Philology

2007–2012

*Humboldt-Universität zu Berlin, Germany*

Grade: Excellent

2009 – 2010 Erasmus exchange student at Université Aix-Marseille, France

## OTHER RESEARCH AND PROFESSIONAL EXPERIENCE

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### Spokesperson of the network for doctoral candidates

2020–2022

*German Association of Speech-Language Therapy (dbs e.V.)*

### Speech-Language Pathologist

2015–2017

*Median Klinik Berlin Kladow, Clinic for neurological rehabilitation*

### Research Internship

2014–2015

*NeuroCure Clinical Research Center, Charité Berlin*

Advisors: Prof. Dr. Agnes Flöel, Prof. Dr. Marcus Meinzer

### Student Assistantship

2012–2013

*Center for Language and Cognition, University of Groningen, The Netherlands*

Advisor: Prof. Dr. Roelien Bastiaanse

## PUBLICATIONS

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**Martin, S.** & Hartwigsen, G. (2024). Commentary: The dynamics of neuroplasticity in the recovery from post-stroke aphasia. *Brain & Language*, in press.

Schuckart, M.\*, **Martin, S.\***, Tune, S., Schmitt, L.-M., Hartwigsen, G., & Obleser, J. (under review). Limited cognitive resources reduce the language predictability benefit across the adult lifespan. *Preprint*. doi:10.1101/2024.05.08.592872

Numssen, O., **Martin, S.**, Williams, K., Knösche, T., & Hartwigsen, G. (2024). Quantification of subject motion during TMS via pulsewise coil displacement. *Brain Stimulation*, in press. doi:https://doi.org/10.1016/j.brs.2024.08.009

**Martin, S.**, Frieling, R., Saur, D., & Hartwigsen, G. (2023). TMS over the pre-SMA enhances semantic cognition via remote network effects on task-based activity and connectivity. *Brain Stimulation*, 16(5), 1346-1357. doi:10.1016/j.brs.2023.09.009

**Martin, S.**, Williams, K., Saur, D., & Hartwigsen, G. (2023). Age-related reorganization of functional network architecture in semantic cognition. *Cerebral Cortex*, 33(8), 4886-4903. doi:10.1093/cercor/bhac387

Kuhnke, P., Chapman, C., Cheung, V., Turker, S., Graessner, A., **Martin, S.**, Williams, K., & Hartwigsen, G. (2022). The role of the angular gyrus in semantic cognition: A synthesis of five functional neuroimaging studies. *Brain Structure and Function*. doi:10.1007/s00429-022-02493-y

**Martin, S.**, Saur, D., & Hartwigsen, G. (2022). Age-dependent contribution of domain-general networks to semantic cognition. *Cerebral Cortex*, 32(4), 870–890. doi:10.1093/cercor/bhab252

Darkow, R., **Martin, S.**, Burchert, F., Meinzer, M., & Flöel, A. (2015). Effekte von Benennttraining und Diskurstraining auf Spontansprache bei Aphasie: Ein Einzelfall unter transkranieller Gleichstromstimulation. *Sprache, Stimme, Gehör*, 39, 140-145. doi:10.1055/s-0035-1559656

## TALKS

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About my research

**Psychologie und Gehirn (PuG)** 05/2024  
*Beyond motor effects: Repetitive TMS in cognitive control and the impact of protocol selection*  
Talk at symposium on individualized TMS in cognition

**German Society for Neurorehabilitation (DGNR)** 12/2023  
*Functional interactions and plasticity in the language network—Insights from young and aging brains*  
Invited talk at symposium on neurorehabilitation, plasticity, and learning

**Korea Institute for Advanced Study (KIAS)** 11/2022  
*The aging brain in semantic cognition—Insights from fMRI and TMS*  
Invited talk at the Center for Artificial Intelligence and Natural Sciences at KIAS

**Würzburger Aphasietage** 03/2022  
*Aphasia as neural network disorder*

**German Association of Speech-Language Therapy (dbs e.V.)** 11/2021  
*Non-invasive brain stimulation techniques in language rehabilitation*  
Invited talk at annual student workshop of dbs

**Psychologie und Gehirn (PuG)** 06/2021  
*The role of domain-general networks in semantic processing in the young and the aging brain*  
Presented at symposium "Cognition and plasticity in the aging brain". I also organized and chaired the symposium.

**German Academic Scholarship Foundation**

03/2021

*Domain-general networks in semantic processing in the aging brain*

Presented at annual meeting for doctoral students of the German Academic Scholarship Foundation (Studienstiftung des deutschen Volkes).

**Clinic Christophsbad, Göppingen, Germany**

04/2019

*The application of non-invasive brain stimulation techniques in neurorehabilitation*

Invited talk at colloquium of rehabilitation clinic.

**Annual meeting German Society for Aphasia Rehabilitation, Freiburg, Germany**

11/2014

*Expressing your own intentions with aphasia: A comparison of a naming and a discourse treatment, both enhanced by transcranial direct current stimulation*

About Open Science

**Colloquium at MPI for Human Cognitive and Brain Sciences**

01/2022

*Advancing the responsible conduct of research at the MPI CBS*

Invited talk to present a recommendations paper I wrote together with other researchers from MPI CBS (available here: [osf.io/9n2at/](https://osf.io/9n2at/))

**Research Interactions Symposium by Wiley**

06/2021

*Trust in science: How early career researchers benefit from open and transparent research practices*

Invited talk at symposium organized by Wiley.

Slides for selected talks are available on my OSF site: [osf.io/hvzu2/](https://osf.io/hvzu2/)

**CONFERENCE PROCEEDINGS & POSTERS**

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**Martin, S.**, Kuhnke, P., Chapman, C., & Hartwigsen, G.

06/2024

*Aging effects on task-based activity and functional networks during semantic processing and rest, OHBM, Seoul, South Korea*Numssen, O., **Martin, S.**, Williams, K., Knösche, T., & Hartwigsen, G.

06/2024

*A quality metric to assess pulswise coil displacements during TMS, OHBM, Seoul, South Korea*Schuckart, M., **Martin, S.**, Tune, S., Schmitt, L.-M., Hartwigsen, G., & Obleser, J.

06/2024

*No free lunch in language prediction – Limitation of cognitive resources reduces the impact of surprisal at multiple time scales, HörHanse, Lübeck, Germany*Ferrante, M., **Martin, S.**, & Hartwigsen, G.

10/2023

*Probing the functional relevance of pre-SMA and aIFG for controlled semantic processing with transcranial magnetic stimulation, Society for the Neurobiology of Language (SNL), Marseille, France***Martin, S.**, Schuckart, M., Obleser, J., & Hartwigsen, G.

10/2023

*The impact of domain-general cognitive load on language processing in the aging brain, Society for the Neurobiology of Language (SNL), Marseille, France*Schuckart, M., Tune, S., Schmitt, L.-M., Hartwigsen, G., **Martin, S.**, & Obleser, J.

07/2023

*No free lunch in language prediction – Limitation of cognitive resources reduces the impact of surprisal at multiple time scales, Salzburg Mind and Brain Annual Meeting, Salzburg, Austria***Martin, S.**, Frieling, R., Saur, D., & Hartwigsen, G.

06/2023

*Facilitatory stimulation of the pre-SMA enhances semantic cognition via remote network effects in task-based activity and connectivity, selected for poster flash session with additional talk. Psychologie und Gehirn (PuG), Tübingen, Germany*

- Martin, S.**, Frieling, R., Saur, D., & Hartwigsen, G. 03/2023  
*Facilitatory stimulation of the pre-SMA has distinct effects on task-based activity and connectivity networks in healthy aging*, selected as "hot abstract" with talk.Congress for Clinical Neuroscience (DGKN), Hamburg, Germany, Clinical Neurophysiology 148:e5-e6
- Martin, S.**, Frieling, R., Saur, D., & Hartwigsen, G. 02/2023  
*Facilitatory stimulation of the pre-SMA has distinct effects on task-based activity and connectivity*, Brain Stimulation, Lisbon, Portugal
- Martin, S.**, Saur, D., & Hartwigsen, G. 06/2021  
*Age-dependent contribution of domain-general networks to semantic cognition*, OHBM, virtual edition
- Martin, S.**, Saur, D., & Hartwigsen, G. 11/2020  
*The multiple-demand network in language processing of the young and the aging brain*, Congress for Clinical Neuroscience (DGKN), virtual edition, Clinical Neurophysiology 131:e201-e202
- van Scherpenberg, C., **Martin, S.**, Hartwigsen, G., Obrig, H., & Beese, C. 09/2019  
*Age-related decline of semantic inhibition despite the preservation of semantic memory*, PaePsy, Leipzig, Germany
- Martin, S.**, Saur, D., & Hartwigsen, G. 08/2019  
*The multiple-demand network in language processing: Its role in the aging brain*, Society for the Neurobiology of Language (SNL), Helsinki, Finland
- Martin, S.**, Darkow, R., Burcher, F, Meinzer, M., & Flöel, A. 09/2014  
*Improving communication in aphasia: A comparison of naming- and discourse based treatment, both facilitated by transcranial direct current stimulation (tDCS)*, Science of Aphasia, Venice, Italy
- Darkow, R., Meinzer, M., **Martin, S.**, Würtz, A. & Flöel, A. 12/2013  
*Transcranial direct current stimulation and aphasia*, German Society for Neurorehabilitation, Berlin, Germany

## HONORS & AWARDS

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- Poster prize** 06/2023  
Psychologie und Gehirn (PuG)
- PhD fellowship (80,000 €)** 2018–2022  
German Academic Scholarship Foundation (Studienstiftung des deutschen Volkes)  
Full stipend for graduate program
- Poster prize** 11/2020  
64th Annual Meeting of the German Society for Clinical Neurophysiology and Functional Imaging (DGKN)
- First prize at Science Slam** 02/2019  
20th Annual Meeting of the German Association of Speech-Language Therapy
- Travel grant (1,500 €)** 2014  
Erasmus Mundus program
- Erasmus Mundus stipend (12,000 €)** 2012–2014  
Erasmus Mundus Program European Union  
Full stipend for Master's studies
- DAAD PROMOS stipend (2,000 €)** 2011  
German Academic Exchange Service

## TEACHING

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- Language and Aging** 05/2023  
Invited guest lecture by IMPRS graduate school NeuroCom within the lecture series "Language and Communication"  
MPI CBS, Leipzig, Germany
- Introduction to Mixed Models** 04/2023  
Invited guest lectureship by the Department of Psychology for 3-day workshop on advanced regression and mixed models for master's students  
University of Gent, Gent, Belgium
- Introduction to Data Analysis in Cognitive Neuroscience** 10/2022  
One-day workshop for visiting students from the Master's program of Cognitive Neuroscience from University of Amsterdam at MPI CBS  
MPI CBS, Leipzig, Germany
- Data analysis with R** 06/2021  
Invited workshop at the 5th Summer School of the PhDnet of the German Association of Speech-Language Therapy. I built an R package for the workshop:  
[gitlab.gwdg.de/sandra.martin/r-workshop-summer-school-2021](https://gitlab.gwdg.de/sandra.martin/r-workshop-summer-school-2021)
- Introduction to fMRIPrep** 05/2020  
Introductory workshop at Neuropsychology department of MPI CBS how to run fMRIPrep for preprocessing fMRI data
- Invited workshop at annual meeting of German Society for Aphasia Research** 10/2019  
Aphasia as a network disorder: Implications for speech-language therapy and the application of non-invasive brain stimulation methods for recovery from aphasia. Leipzig University, Leipzig, Germany  
Slides for lectures and workshops are available on my OSF site: [osf.io/hvzu2/](https://osf.io/hvzu2/)

## MENTORING & SUPERVISION

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- Master thesis**  
Pia Siegel (M. Sc., 2023, Leipzig University)  
Katharina Polsterer (M. A., 2022, University of Groningen)  
Regine Frieling (M. A., 2021, University of Cologne)
- Interns / Student assistants**  
Christian Koblitz (M. Sc., 2023, Leipzig University)  
Marcel Blumenthal (M. Sc., 2023, Leipzig University)  
Madeleine Mesgarian (B. Sc., 2023, Freie Universität Berlin)  
Caroline Duchow (M. A., 2019, University of Erfurt)  
Annika Dunau (M. A., 2018, Leipzig University)

## OPEN SCIENCE

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- fMRI Preregistration template** 2021  
Co-author of current template. [doi:10.23668/psycharchives.5121](https://doi.org/10.23668/psycharchives.5121)
- Panelist at discussion on Research Data Management** 05/2021  
Invited speaker at panel discussion during the 4th research data management workshop organized by the Max Planck Digital Library. I was invited to represent the perspective of early career researchers on the handling and publication of research data.

**Open Access Ambassador of the Max Planck Society**

2019-2020

Including training at a 2-day conference on Open Access and Open Science, organized by the Max Planck Digital Library. Info: [oambassadors.mpg.de/ambassadors-2019](https://oambassadors.mpg.de/ambassadors-2019)

**Doing Good – Scientific Practice under Review**

11/2019

Organizer of a 2-day symposium on Open Science and Good Scientific Practice at MPI CBS, Leipzig. Info: [cbs.mpg.de/doing-good](https://cbs.mpg.de/doing-good)

**Open Science Initiative MPI CBS**

since 2018

Co-founder of the initiative. We organize workshops on Open Science-related topics, invite speakers for talks, and foster the implementation of good scientific practices at MPI CBS. Info: [cbs.mpg.de/de/cbs-open-science](https://cbs.mpg.de/de/cbs-open-science)

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**SKILLS**

<b>Coding</b>	R, Python, Matlab, Bash
<b>Development</b>	Git (Github, Gitlab)
<b>Data analysis</b>	fMRIPrep, SPM12, Brain Imaging Data Structure (BIDS), Nilearn, mixed-effects models, multivariate analysis, graph theory, cognitive modeling (Summer School Model-based Neuroscience at University of Amsterdam, 08/2022)
<b>Experimental programming</b>	Presentation, Psychopy
<b>Methods</b>	Functional and structural magnetic resonance imaging, transcranial magnetic stimulation, transcranial direct current stimulation
<b>Writing</b>	$\LaTeX$ , Markdown, MS Office
<b>Design</b>	Inkscape
<b>Languages</b>	German (native), English (fluent), French (fluent), Hebrew (basic)

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**OUTREACH**

- Workshop "Introduction to Programming in Neuroscience" at Girls' and Boys' Day 2022
- Article about my research at MDR Wissen (in German), 09/2021: [Link to article](#)
- Co-author on the Blog Thinky & Brain by MPI CBS, 08/2020: [Link to article](#)
- Guest at the Orion Open Science Podcast, 11/2019: [Link to episode](#)

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**JOURNAL REVIEWING**

<b>Ad-hoc-reviewing</b>	Brain, Brain Communications, Cerebral Cortex, Brain & Language, Frontiers in Psychology, Journal of Cognitive Neuroscience, NeuroImage, NeuroImage Clinical, Imaging Neuroscience
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**PROFESSIONAL MEMBERSHIPS**

- Organization for Human Brain Mapping (OHBM)
- Society for the Neurobiology of Language (SNL)

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**REFERENCES****Prof. Dr. Gesa Hartwigsen**

Chair in Biological and Cognitive Psychology, Wilhelm Wundt Institute for Psychology, University of Leipzig, Germany  
Principal investigator of Research Group Cognition & Plasticity

Max Planck Institute for Human Cognitive and Brain Sciences Leipzig, Germany  
hartwigsen@cbs.mpg.de

**Prof. Dr. Dorothee Saur**

Chair in Neurology and Co-Chair of the Department of Neurology  
University Hospital Leipzig, Germany  
dorothee.saur@medizin.uni-leipzig.de

**Prof. Dr. Jonas Obleser**

Chair in Physiological Psychology and Research Methods  
Co-director, Department of Psychology, University of Lübeck, Germany  
jonas.obleser@uni-luebeck.de