

Dr. Sandra Martin

ACADEMIC APPOINTMENTS

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

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

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

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

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/)

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/

CONFERENCE PROCEEDINGS & POSTERS

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** 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** 2014
Erasmus Mundus program
- Erasmus Mundus stipend** 2012–2014
Erasmus Mundus Program European Union
Full stipend for Master's studies
- DAAD PROMOS stipend** 2011
German Academic Exchange Service

TEACHING

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

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/

MENTORING & SUPERVISION

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

fMRI Preregistration template

2021

Co-author of current template. doi: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

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

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

SKILLS

Coding	R, Python, Matlab, Bash
Development	Git (Github, Gitlab)
Data analysis	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)
Experimental programming	Presentation, Psychopy
Methods	Functional and structural magnetic resonance imaging, transcranial magnetic stimulation, transcranial direct current stimulation
Writing	\LaTeX , Markdown, MS Office
Design	Inkscape
Languages	German (native), English (fluent), French (fluent), Hebrew (basic)

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](#)

JOURNAL REVIEWING

Ad-hoc-reviewing	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)

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