

Weiyong Xu

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🏛 Department of Psychology, University of Jyväskylä 🗣 Chinese

Research Interests

Topics: Memory reorganization, Sleep and Rest, Bodily Rhythms and Learning, Audiovisual Learning

Methods: MEG, EEG, Machine Learning, Calcium Imaging (One-photon), Behavioral Measures

Education

PhD	University of Jyväskylä , Psychology	Finland
	<ul style="list-style-type: none"> Department: Department of Psychology Thesis: Brain activity changes related to learning of audiovisual associations in reading 	2015 – 2020
MS	Xi'an Jiaotong University , Biomedical Engineering	China
	<ul style="list-style-type: none"> Department: Institute of Biomedical Engineering Thesis: Functional connectivity and complex network analysis of the aging brain 	2013 – 2015
BS	Xi'an Jiaotong University , Biomedical Engineering	China
	<ul style="list-style-type: none"> Department: School of Life Science and Technology Thesis: EEG functional connectivity of vascular dementia patients in an oddball task 	2009 – 2013

Experience

Department of Psychology, University of Jyväskylä , Postdoctoral Researcher	Finland
Project: The reorganization of memory representations during rest and sleep	Sept 2022 – Aug 2025
<ul style="list-style-type: none"> Study memory reorganization during rest and sleep using human neuroimaging methods (MEG/EEG), machine learning, and animal models (One-photon calcium imaging in mice). 	3 years
Department of Psychology, University of Jyväskylä , Postdoctoral Researcher	Finland
Project: Bodily rhythms and learning	Sept 2020 – Aug 2022
<ul style="list-style-type: none"> Investigated the interaction between physiological rhythms (such as heartbeat and breathing) and learning processes using behavioral and brain measures (M/EEG) in the Academy of Finland project "Optimizing Learning: Synchrony of the Brain and Body as a Tool?" (Dr. Miriam Nokia's group). Set up new calcium imaging systems and developed a data analysis pipeline for the Academy of Finland project "Dentate gyrus-the gateway to memory?" (Dr. Markku Penttonen). 	2 years
Department of Psychology, University of Jyväskylä , Doctoral Student	Finland
Project: Brain activity changes related to learning of audiovisual associations in reading	Sept 2015 – Sept 2020
<ul style="list-style-type: none"> Doctoral Researcher (2019-09 – 2020-09) Early Stage Researcher (2015-09 – 2019-09), ChildBrain Project, Horizon2020 Marie Skłodowska-Curie Action (MSCA) Innovative Training Network (ITN) 	5 years 1 month

Research Visits

Visiting Researcher	Finland
Aalto University	Feb 2025 – Mar 2025
<ul style="list-style-type: none"> Department: Department of Neuroscience and Biomedical Engineering Host: Prof. Lauri Parkkonen 	

Visiting Researcher

Tohoku University

- Host: Prof. Hyeonjeong Jeong

Japan

May 2025 – May 2025

Visiting Student

Donders Institute for Brain, Cognition and Behaviour

- Host: Prof. Robert Oostenveld
- Learn MEG data analysis methods

Netherlands

July 2016 – July 2016

Visiting Student

Aston Brain Center

- Host: Prof. Joel B. Talcott and Dr. Caroline Witton
- Learn child MEG and MRI measurements and data analysis

UK

Feb 2018 – Feb 2018

Funding

The reorganization of memory representations during rest and sleep

Academy of Finland Postdoctoral project

- Role: Principal Investigator
- Amount: 234,782 EUR

Sept 2022 – Aug 2025

Invited Talks

Neural correlates of retrospective memory confidence during face-name associative learning

26th Human Brain Science Seminar, Tohoku University

Sendai, Japan

2025

Oral Presentations

Neural correlates of retrospective memory confidence during face-name associative learning

The Learning Brain Across the Lifespan: Neural Resources, Imaging Indicators and Relevance for Cognitive Competence, Learning and Plasticity Meeting 2026

Ylläs, Finland

2026

From Novice to Expert: Different Levels of Learning in the Brain Revealed by MEG

Jyväskylä Brain & Mind Annual Seminar

Jyväskylä, Finland

Jan 2026

Neural correlates of retrospective memory confidence during face-name associative learning

International Conference on Cognitive Neuroscience (ICON 2025)

Porto, Portugal

2025

The reorganization of memory representations during rest and sleep

Neuroscience and Biomedical Engineering Seminar, Aalto University

Espoo, Finland

2025

Neural correlates of retrospective memory confidence during face-name associative learning

Staresina Lab Meeting

Online

2025

Differential brain processes of newly learned and overlearned audiovisual associations

Jyväskylä Brain & Mind Annual Seminar 2024

Jyväskylä, Finland

2024

Neural correlates of retrospective memory confidence during face-name associative learning

MEG Nord 2023

Jyväskylä, Finland

2023

Brain responses to letters and speech sounds and their correlations with cognitive skills related to reading in children

ChildBrain Conference 2018

Leuven, Belgium

2018

Audiovisual processing of Chinese characters elicits integration and congruency effects in MEG Stockholm, Sweden
MEG Nord 2018 2018

Poster Presentations

Differential brain processes of newly-learned and overlearned audiovisual associations Jyväskylä, Finland
Brains and Bodies in Social Interaction, Learning, and Wellbeing Conference 2024 2024

Differential brain processes of newly-learned and overlearned audiovisual associations Vienna, Austria
FENS Forum 2024 2024

Changes in brain activity during learning of grapheme–phoneme associations Helsinki, Finland
Society for the Neurobiology of Language (SNL 2019) 2019

Changes in brain activity during learning of grapheme–phoneme associations Jyväskylä, Finland
MEG Nord 2019 2019

Brain responses to letters and speech sounds and their correlations with cognitive skills related to reading in children San Diego, USA
Society for Neuroscience (SfN 2018) 2018

Brain responses to letters and speech sounds and their correlations with cognitive skills related to reading in children Jyväskylä, Finland
International Summer School "Life after PhD" 2018

Long-term learning effect on audio-visual processing of Chinese characters Taipei, Taiwan
International Conference on Cognitive Science (ICCS 2017) 2017

Development of audio-visual integration in children Jyväskylä, Finland
International Summer School "Understanding Learning in the Brain" 2017

Audio-visual processing of written characters and speech sounds Aarhus, Denmark
MEG Nord 2017 2017

Audio-visual processing of Chinese characters and speech sounds Seoul, South Korea
Biomag 2016 (20th International Conference on Biomagnetism) 2016

Workshops, Seminars, and Training

Cutting EEGX 2024 Online
Workshop 2024

Brain & Mind Symposium 2023 Espoo, Finland
Workshop 2023

eSleep Europe 2023 Online
Workshop 2023

Brain and Language 2021: Virtual Conference Methods Workshop Jyväskylä, Finland
Workshop 2021

6th Annual Research Seminar of CIBR Jyväskylä, Finland
Workshop 2018

ChildBrain 6th Workshop, Donders Institute Nijmegen, Netherlands
Workshop 2018

5th Annual Research Seminar of CIBR Workshop	Jyväskylä, Finland 2017
ChildBrain 5th Workshop, Aston University Workshop	Birmingham, UK 2017
Nordic & Baltic Doctoral Programmes in Psychology Joint Symposium Workshop	Tartu, Estonia 2017
ChildBrain 4th Workshop, Donders Institute Workshop	Nijmegen, Netherlands 2017
4th Annual Research Seminar of CIBR Workshop	Jyväskylä, Finland 2016
ChildBrain 3rd Workshop Workshop	Leuven, Belgium 2016
Toolkit of Cognitive Neuroscience: Advanced data analysis and source modelling of EEG/MEG Workshop	Nijmegen, Netherlands 2016
Winter School on Neural Mechanisms of Learning Workshop	Jyväskylä, Finland 2016
Elekta Neuromag Triux MEG System Start Program, CIBR Workshop	Jyväskylä, Finland 2016
ForLearning International Symposium on Learning and Learning Difficulties Workshop	Jyväskylä, Finland 2015
ChildBrain 1st Workshop (Kick-off) Workshop	Münster, Germany 2015
MEG Driving License Workshop	University of Jyväskylä, Finland 2015

Teaching

PSYS2102 Master's thesis ending seminar instructor • University of Jyväskylä	2023
CNSJ1202 Designing cognitive neuroscience research instructor • University of Jyväskylä	2022
CIBA120 EEG data analysis Demo using MNE Python demo instructor • University of Jyväskylä	2022
CIPA113 Bilingual Development essays grading • University of Jyväskylä	2021

CIPA112 Psychology of Language essays grading • University of Jyväskylä	2021
CIPA213 Developmental Language Related Disorders instructor • University of Jyväskylä	2019
CIPA100 Psychology Research at JYU essays grading • University of Jyväskylä	2016 – 2019
PSYS123 Neuropsychology 3B MEG demonstrations instructor • University of Jyväskylä	2017
Introduction to scripting experiments with Presentation instructor • University of Jyväskylä	2016

Awards

Winner of the best poster competition Annual Research Seminar of Centre for Interdisciplinary Brain Research (CIBR)	2017
Siyuan Student Scholarship Xi'an Jiaotong University	2010 – 2013

Service and Outreach

Membership: Brain Research Society of Finland (BRSF), Federation of European Neuroscience Societies (FENS), International Brain Research Organisation (IBRO), Society for the Neurobiology of Language (SNL), Society for Neuroscience (SfN)

Ad Hoc Reviewer: NeuroImage, Frontiers in Psychology, Journal of Neuroscience, Child Development, Journal of Neurolinguistics, Computer Methods and Programs in Biomedicine, Acta Psychologica, npj Science of Learning, Journal of Open Source Software, Neuropsychologia

Supervision

Master's: Master theses (1): Jukka Lopmeri (ongoing)

Bachelor's: Bachelor's theses (3)

Doctoral: Co-supervisor for 3 doctoral students: Jiaqi Zheng, Aino Sorsa, Suvi Lehtonen.

Skills

Languages: Chinese (Mother tongue), English (Proficient)

Programming: Python, MATLAB, R

Neuroimaging: MEG analysis (MNE-Python, FieldTrip), EEG analysis, Calcium imaging analysis, Machine learning for neuroimaging

Tools: Git/GitHub, LaTeX, Linux/Unix

Scientific and Societal Impact

- Outreach: Organize activities for Researcher's night events at JYU (2016, 2017, 2020, 2021, 2022, 2024, 2025)
- Tours: MEG lab tours for Finnish high school students, Bachelor and Master level students (2017)
- Tours: MEG lab tours for the Finnish Psychology Students' Association (2017)
- Events: Brain awareness week event "Developing Brain" at JYU (Poster presentation) (2016)

Publications

- Development of brain responses to speech sounds and associations with reading and reading related skills in adults with childhood dyslexia** Apr 2026
Sorsa, A., Tretow, A., **Xu, W.**, Gerike, G., Lohvansuu, K., Hämäläinen, J. A., Leppänen, P. H. T.
[10.1016/j.ijpsycho.2026.113339](https://doi.org/10.1016/j.ijpsycho.2026.113339) (International Journal of Psychophysiology)
- Magnetoencephalography Source Connectivity Pipeline Reveals Long-Range Connectivity in Audio-Visual Integration** Apr 2026
Bornfleth, H., Cho, J. H., Rusiniak, M., Kornweibel, O., **Xu, W.**, Hämäläinen, J., Spangler, R.
[10.1111/ejn.70470](https://doi.org/10.1111/ejn.70470) (European Journal of Neuroscience)
- Neural signatures of automatic letter-speech sound integration in literate adults** Nov 2025
Xu, W., Li, X., Kolozsvári, O., Sorsa, A., Nokia, M., Hämäläinen, J.
[10.1162/imag.a.1021](https://doi.org/10.1162/imag.a.1021) (Imaging Neuroscience)
- Two-Day Artificial Orthography Learning MEG Dataset: From Grapheme to Meaning** Oct 2025
Xu, W., Kolozsvári, O., Hämäläinen, J., Oostenveld, R.
[10.17011/jyx/dataset/106229](https://doi.org/10.17011/jyx/dataset/106229) (JYX, University of Jyväskylä)
- Dynamic changes in electrical brain activity during passive learning of foreign speech sound discrimination** July 2025
Li, Q., Kurkela, J. L. O., Lohvansuu, K., Hämäläinen, J. A., Li, X., **Xu, W.**, Astikainen, P.
[10.1093/cercor/bhaf181](https://doi.org/10.1093/cercor/bhaf181) (Cerebral Cortex)
- Optimizing learning - synchrony of the brain and body as a tool?** Nov 2024
Nokia, M., **Xu, W.**
[10.17011/jyx/dataset/98410](https://doi.org/10.17011/jyx/dataset/98410) (JYX, University of Jyväskylä)
- The cardiac cycle modulates learning-related interoception** Aug 2024
Nokia, M. S., **Xu, W.**, Wikgren, J.
[10.1016/j.tics.2024.05.007](https://doi.org/10.1016/j.tics.2024.05.007) (Trends in Cognitive Sciences)
- Neural correlates of retrospective memory confidence during face-name associative learning** May 2024
Xu, W., Li, X., Parviainen, T., Nokia, M.
[10.1093/cercor/bhae194](https://doi.org/10.1093/cercor/bhae194) (Cerebral Cortex)
- Cardiorespiratory rhythm-contingent trace eyeblink conditioning in elderly adults** May 2024
Santhana Gopalan, P. R., **Xu, W.**, Waselius, T., Wikgren, J., Penttonen, M., Nokia, M. S.
[10.1152/jn.00356.2023](https://doi.org/10.1152/jn.00356.2023) (Journal of Neurophysiology)
- Cardiac cycle and respiration phase affect responses to the conditioned stimulus in young adults trained in trace eyeblink conditioning** Mar 2022
Waselius, T., **Xu, W.**, Sparre, J. I., Penttonen, M., Nokia, M. S.
[10.1152/jn.00298.2021](https://doi.org/10.1152/jn.00298.2021) (Journal of Neurophysiology)
- Coherence Between Brain Activation and Speech Envelope at Word and Sentence Levels Showed Age-Related Differences in Low Frequency Bands** May 2021
Kolozsvári, O. B., **Xu, W.**, Gerike, G., Parviainen, T., Nieminen, L., Noiray, A., Hämäläinen, J. A.
[10.1162/nol_a_00033](https://doi.org/10.1162/nol_a_00033) (Neurobiology of Language)
- Rapid changes in brain activity during learning of grapheme-phoneme associations in adults** Oct 2020
Xu, W., Kolozsvári, O. B., Oostenveld, R., Hämäläinen, J. A.
[10.1016/j.neuroimage.2020.117058](https://doi.org/10.1016/j.neuroimage.2020.117058) (NeuroImage)

- Neural Responses to Musical Rhythm in Chinese Children With Reading Difficulties** June 2020
Chiang, C. H., Hämäläinen, J., **Xu, W.**, Wang, H. L.
[10.3389/fpsyg.2020.01013](https://doi.org/10.3389/fpsyg.2020.01013) (Frontiers in Psychology)
- Context-dependent minimisation of prediction errors involves temporal-frontal activation** Feb 2020
Hsu, Y. F., **Xu, W.**, Parviainen, T., Hämäläinen, J. A.
[10.1016/j.neuroimage.2019.116355](https://doi.org/10.1016/j.neuroimage.2019.116355) (NeuroImage)
- Brain activity changes related to learning of audiovisual associations in reading** 2020
Xu, W.
urn.fi/URN:ISBN:978-951-39-8220-1 (JYU Dissertations 249, University of Jyväskylä)
- Top-Down Predictions of Familiarity and Congruency in Audio-Visual Speech Perception at Neural Level** July 2019
Kolozsvári, O. B., **Xu, W.**, Leppänen, P. H. T., Hämäläinen, J. A.
[10.3389/fnhum.2019.00243](https://doi.org/10.3389/fnhum.2019.00243) (Frontiers in Human Neuroscience)
- Audiovisual Processing of Chinese Characters Elicits Suppression and Congruency Effects in MEG** Feb 2019
Xu, W., Kolozsvári, O. B., Oostenveld, R., Leppänen, P. H. T., Hämäläinen, J. A.
[10.3389/fnhum.2019.00018](https://doi.org/10.3389/fnhum.2019.00018) (Frontiers in Human Neuroscience)
- Aging-related changes of EEG synchronization during a visual working memory task** Dec 2018
Teng, C., Cheng, Y., Wang, C., Ren, Y., **Xu, W.**, Xu, J.
[10.1007/s11571-018-9500-6](https://doi.org/10.1007/s11571-018-9500-6) (Cognitive Neurodynamics)
- Brain Responses to Letters and Speech Sounds and Their Correlations With Cognitive Skills Related to Reading in Children** Aug 2018
Xu, W., Kolozsvári, O. B., Monto, S. P., Hämäläinen, J. A.
[10.3389/fnhum.2018.00304](https://doi.org/10.3389/fnhum.2018.00304) (Frontiers in Human Neuroscience)
- Assay of melamine in milk products with a pH-mediated stacking technique in capillary electrophoresis** Mar 2014
Kong, Y., Yuan, J., Wang, Z., Hou, Z., Yu, J., Jin, H., Xie, M., Chang, N., **Xu, W.**, Zhao, Y., Tang, Y.
[10.1002/jssc.201300603](https://doi.org/10.1002/jssc.201300603) (Journal of Separation Science)