

Haojie Wen

Postdoctoral Researcher
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Academic Experience

- 2023 - Present** **Postdoctoral Researcher**
School of Systems Science & State Key Laboratory of Cognitive Neuroscience and Learning, Beijing Normal University, China
Supervisors:
- **Prof. Yanchao Bi** (Concept Lab; relocated to School of Psychological and Cognitive Science, Peking University, 2024 - present)
 - **Prof. Dahui Wang**, School of Systems Science, Beijing Normal University

Education

- 2017 - 2023** **Ph.D. in Psychology (Cognitive Neuroscience)**
Beijing Normal University, China
Supervisor: Prof. Yanchao Bi
Thesis:
Tools And the Human Brain: The brain Network underlying Tool processing
Aug 2018 - Sep 2018: Visiting Student, Alfonso Caramazza's lab, Harvard University, USA
- 2013 - 2017** **B.S. in Computer Science and Technology**
Wuhan University, China
- 2015 - 2017** **B.S. in Psychology (Double Degree)**
Central China Normal University, China

Research Interests

To examine how human cognitive capacities evolved and interact to shape the modern human brain.

Neural bases of technological cognition:

Investigating the functional and structural neural correlates of tool use using MRI and behavioral approaches.

Effects of language on other cognitive functions

Studying how language experience shapes vision and tool use via cross-species comparisons and comparisons across deaf populations with different early sign-language exposure.

Publications & Manuscripts

First / Co-first Author

Neural bases of technological cognition:

- Under review** Hao, G.#, **Wen, H.#**, Guo, L.#, Chen, Y., Bi, Y.*, & Yu, S.* *Flexible Tool Selection through Low-dimensional Attribute Alignment of Vision and Language.*
- 2023** **Wen, H.**, Song, Y., Liang, M., Zhang, P., Wang, X.*, & Bi, Y. *Pulvinar Response Profiles and Connectivity Patterns to Object Domains. Journal of Neuroscience*, 43(5): 812-826.
- 2022** **Wen, H.**, Xu, T., Wang, X., Yu, X.*, & Bi, Y.* *Brain intrinsic connection patterns underlying tool processing in human adults are present in neonates and not in macaques. NeuroImage*, 258, 119339.

Effects of language on other cognitive functions:

- In Preparation** **Wen, H.#**, Wang, K.#, Li, Y., Chen, H., Bao, P.*, Bi, Y.* *When Vision Learns to Speak: Language-Linked Modulation Diverges Between Human and Macaque Visual Cortex.*
- In Preparation** Fan, Z.#, **Wen, H.#**, Wang, X., Bi, Y. *A putaminal computation linking language and tool hierarchies.*
- 2025** **Wen, H.**, & Bi, Y. *Visual cortex through the lens of language. Cognitive Neuroscience*, 1-3.
- 2024** **Wen, H.**, Wang, D., & Bi, Y. *Processing language partly shares neural genetic basis with processing tools and body parts. eNeuro*, 11(8).

Contributing Author

- 2025** Zhu, Z.#, Yang, H.#, **Wen, H.**, Hung, J., Hu, Y., Bi, Y.*, & Yu, X.* *Innate network mechanisms of temporal pole for semantic cognition in neonatal and adult twin studies. Nature Communications*, 16(1), 3835.

Research Grants

Principal Investigator

- *Cognitive neural mechanisms underlying human brain processing of artifacts*
China Postdoctoral Science Foundation, General Program
Dec 2024 - Jun 2026
- *Tools and the human brain: neural mechanisms underlying tool-object processing in the human visual perception system*
China Postdoctoral Science Foundation
National Postdoctoral Researcher Support Program (Category C)
Dec 2023 - Dec 2025

Major Research Team Member

- *Developmental mechanisms of neural networks underlying semantic knowledge in the human brain: cross-sectional and longitudinal neuroimaging studies in children aged 0–6 years*
National Natural Science Foundation of China, General Program
Jan 1, 2026 - Dec 31, 2029

PI: Assoc. Prof. Xi Yu

- *Grid-like representations of conceptual knowledge in the human brain*
National Natural Science Foundation of China, General Program
Jan 1, 2026 - Dec 31, 2029
PI: Assoc. Prof. Xiaoying Wang

Talks & Conference Presentations

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| 2025 | <i>Distinct Modulatory Influences on the Visual Cortex: Language in Humans, Vision in Macaques.</i> The Seeing and Acting Workshop, Coimbra, Portugal <i>Poster</i> |
| 2025 | <i>Cognitive Neuroscience of Tool Use.</i> Lecture Series on the Development of Applied Psychology, Civil Aviation Flight University of China, Online <i>Oral</i> |
| 2024 | <i>Processing Language Partly Shares Neural Genetic Basis with Processing Tools and Body Parts.</i> Joint Lab Meeting, Zhejiang University, Hangzhou, China <i>Oral</i> |
| 2024 | <i>Pulvinar Response Profiles and Connectivity Patterns to Object Domains.</i> Rovereto Workshop on Concepts, Actions, and Objects, Trento, Italy <i>Poster</i> |
| 2023 | <i>Shared Genetic Mechanisms Underlying Neural Processing of Language and Tool Use.</i> Conceptual Brains and Cultural Evolution Workshop, Zhuhai, China <i>Oral</i> |
| 2023 | <i>Language, Tools, Body Parts, and Faces: A Neural Genetic Investigation.</i> Neurobiology of Language Conference, Marseille, France <i>Poster</i> |

Mentorship Experience

Ph.D. Student Co-supervision

Zhiyu Fan, ph.D. Student (2022 - present)

- Co-supervised research on shared hierarchical dependency computations underlying language and tool use, using data from brain-damaged patients and two groups of deaf signers with distinct early sign-language experiences to investigate neural and developmental causality.
- This work has been presented at international conferences (SNL 2023; Seeing and Acting Workshop 2025), and a full manuscript draft has been completed.
- Responsibilities included methodological support, data analysis guidance, and mentoring on Ph.D. proposal development.

Peer Review

Ad hoc reviewer for: *Imaging Neuroscience; Cerebral Cortex; eLife*

Honors & Awards

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| 2023 | Award for Research and Innovation, Beijing Normal University |
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2017 - 2022 Graduate Academic Award / Graduate Freshman Scholarship, Beijing Normal University

Technical Skills

Programming MATLAB; R
Task-based and resting-state functional MRI, encompassing univariate activation analyses, multivariate pattern analyses, and connectivity analyses;
Studies of special populations, including deaf populations, cross-species

Methods comparative studies, and twin-based genetic modeling;
Large-scale online behavioral experiments;
Preliminary text processing and exploratory applications of large language models (LLMs)

Languages Mandarin Chinese (Native); English (Fluent); Jin Chinese (Native)