Haojie Wen

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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

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:

Under review **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.*

Under review Fan, Z.#, **Wen, H.#**, Han, Z., Wang, X., Bi, Y. *Causal evidence for a shared mechanism linking language and tool use via the putamen.*

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

Communication

2018 *Aug 2018 - Sep 2018: Visiting Student, Alfonso Caramazza's lab, Harvard University, USA*

Talks & Conference Presentations

2025 *Distinct Modulatory Influences on the Visual Cortex: Language in Humans, Vision in Macaques.* The Seeing and Acting Workshop, Coimbra, Portugal *Poster*

2025 *Cognitive Neuroscience of Tool Use.* Lecture Series on the Development of Applied Psychology, Civil Aviation Flight University of China, Online *Oral*

2024 *Processing Language Partly Shares Neural Genetic Basis with Processing Tools and Body Parts.* Joint Lab Meeting, Zhejiang University, Hangzhou, China *Oral*

2024 *Pulvinar Response Profiles and Connectivity Patterns to Object Domains.* Rovereto Workshop on Concepts, Actions, and Objects, Trento, Italy *Poster*

2023 *Shared Genetic Mechanisms Underlying Neural Processing of Language and Tool Use.* Conceptual Brains and Cultural Evolution Workshop, Zhuhai, China *Oral*

2023 *Language, Tools, Body Parts, and Faces: A Neural Genetic Investigation.* Neurobiology of Language Conference, Marseille, France *Poster*

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

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

Technical Skills

Programming	MATLAB; R
Methods	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 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)