Stanford

Laura Gwilliams

Assistant Professor of Psychology and, by courtesy, of Linguistics

Bio

BIO

Laura Gwilliams is jointly appointed between Stanford Psychology, Wu Tsai Neurosciences Institute and Stanford Data Science. Her work is focused on understanding the neural representations and operations that give rise to speech comprehension in the human brain. To do so, she brings together insight from neuroscience, linguistics and machine learning, and takes advantage of recording techniques that operate at distinct spatial scales (MEG, ECoG and Neuropixels).

ACADEMIC APPOINTMENTS

- Assistant Professor, Psychology
- Assistant Professor (By courtesy), Linguistics
- Member, Bio-X
- Member, Wu Tsai Human Performance Alliance
- Member, Maternal & Child Health Research Institute (MCHRI)
- Member, Stanford Data Science
- Member, Wu Tsai Neurosciences Institute

ADMINISTRATIVE APPOINTMENTS

- Co-director, SDS Center for Neural Data Science, (2025- present)
- Faculty Director, Koret Human Neurosciences Community Laboratory, (2024- present)

HONORS AND AWARDS

- Neuroscience Fellowship Award, Klingenstein Philanthropies (2025)
- Early Career Award, Whitehall Foundation (2024)
- Glushko Dissertation Prize, Cognitive Science Society (2021)

LINKS

- Gwilliams Laboratory of Speech Neuroscience: https://gwilliams.sites.stanford.edu/
- Laura Gwilliams: https://lauragwilliams.github.io/

Teaching

COURSES

2026-27

- Introduction to Psychology: PSYCH 1 (Win)

2025-26

- Data Science for Neuroscience: DATASCI 194N, PSYCH 294N (Aut)
- Introduction to Psychology: PSYCH 1 (Win)

2024-25

- Data Science for Neuroscience: DATASCI 194N, DATASCI 294N (Win)
- Introduction to Psychology: PSYCH 1 (Spr)
- Language Neuroscience Seminar: LINGUIST 247N, PSYCH 122, PSYCH 222 (Aut)

2023-24

- Unravelling the Inner-Workings of the Brain: Data Science for Neuroscience Capstone: DATASCI 125 (Spr)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Alice Xue

Postdoctoral Faculty Sponsor

Eleonora Beier, Ilina Bhaya-Grossman, Jill Kries, Alexandria McPherson, William Turner

Doctoral Dissertation Advisor (AC)

Irmak Ergin

Doctoral Dissertation Co-Advisor (AC)

Caroline Kaicher, Atlas Kazemian

Doctoral (Program)

Xirong Hu, Takateru Yamakoshi

Publications

PUBLICATIONS

- **Noise Optimization of Basic Signal Component Extraction for Cryogenic and On-Scalp Magnetoencephalography (MEG).** *bioRxiv : the preprint server for biology*
  McPherson, A., Sanchirico, S., Xu, A., Larson, E., Kaestner, M., Turner, W., Gwilliams, L., Taulu, S.
  2026
- **On the speed of conscious perception: how soon is now?** *The Behavioral and brain sciences*
  Turner, W., Hogendoorn, H., Gwilliams, L.
  2026; 49: e195
- **Measuring naturalistic speech comprehension in real time.** *Behavior research methods*
  Ergin, I., Kries, J., Gupta, S., Papworth Burrel, M., Gwilliams, L.
  2026; 58 (4)
- **The spatio-temporal dynamics of phoneme encoding in aging and aphasia.** *The Journal of neuroscience : the official journal of the Society for Neuroscience*

Kries, J., Vandermosten, M., Gwilliams, L.
2025

- **Shared and language-specific phonological processing in the human temporal lobe** *NATURE*
  Bhaya-Grossman, I., Leonard, M. K., Zhang, Y., Gwilliams, L., Johnson, K., Lu, J., Chang, E. F.
  2025

- **Human cortical dynamics of auditory word form encoding.** *Neuron*
  Zhang, Y., Leonard, M. K., Bhaya-Grossman, I., Gwilliams, L., Chang, E. F.
  2025

- **Hierarchical dynamic coding coordinates speech comprehension in the human brain.** *Proceedings of the National Academy of Sciences of the United States of America*
  Gwilliams, L., Marantz, A., Poeppel, D., King, J. R.
  2025; 122 (42): e2422097122

- **Dynamics of pitch perception in the auditory cortex.** *The Journal of neuroscience : the official journal of the Society for Neuroscience*
  Abrams, E. B., Marantz, A., Krementsov, I., Gwilliams, L.
  2025

- **Computational Architecture of Speech Comprehension in the Human Brain** *ANNUAL REVIEW OF LINGUISTICS*
  Gwilliams, L., Bhaya-Grossman, I., Zhang, Y., Scott, T., Harper, S., Levy, D.
  2025; 11: 209-226

- **What we mean when we say semantic: Toward a multidisciplinary semantic glossary.** *Psychonomic bulletin & review*
  Reilly, J., Shain, C., Borghesani, V., Kuhnke, P., Vigliocco, G., Peelle, J. E., Mahon, B. Z., Buxbaum, L. J., Majid, A., Brysbaert, M., Borghi, A. M., De Deyne, S., Dove, et al
  2024

- **Speech prosody enhances the neural processing of syntax.** *Communications biology*
  Degano, G., Donhauser, P. W., Gwilliams, L., Merlo, P., Golestani, N.
  2024; 7 (1): 748

- **Negation mitigates rather than inverts the neural representations of adjectives.** *PLoS biology*
  Zuanazzi, A., Ripollés, P., Lin, W. M., Gwilliams, L., King, J. R., Poeppel, D.
  2024; 22 (5): e3002622

- **Hierarchical dynamic coding coordinates speech comprehension in the brain.** *bioRxiv : the preprint server for biology*
  Gwilliams, L., Marantz, A., Poeppel, D., King, J. R.
  2024

- **Introducing MEG-MASC a high-quality magneto-encephalography dataset for evaluating natural speech processing.** *Scientific data*
  Gwilliams, L., Flick, G., Marantz, A., Pylkkänen, L., Poeppel, D., King, J. R.
  2023; 10 (1): 862

- **Top-down information shapes lexical processing when listening to continuous speech** *LANGUAGE COGNITION AND NEUROSCIENCE*
  Gwilliams, L., Marantz, A., Poeppel, D., King, J.
  2024; 39 (8): 1045-1058

- **Neural dynamics of phoneme sequences reveal position-invariant code for content and order.** *Nature communications*
  Gwilliams, L., King, J. R., Marantz, A., Poeppel, D.
  2022; 13 (1): 6606