Laura Gwilliams

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Education

2015–2020 *Ph.D., Psychology*
New York University, USA
Thesis Title: Towards a mechanistic account of speech comprehension
Supervisors: David Poeppel and Alec Marantz

2012–2013 *M.Sc., Cognitive Neuroscience of Language*
Basque Center on Cognition, Brain and Language (BCBL), Spain
Supervisors: Arthur Samuel and Phillip Monahan

2009–2012 *B.A., Linguistics*
Cardiff University, UK
Supervisor: Lise Fontaine

Research positions

2023-present *Assistant Professor*, Department of Psychology, Stanford University
Faculty Scholar Wu Tsai Neurosciences Institute and Stanford Data Science
PI of the Laboratory of Speech Neuroscience (GLySN) Lab
Co-director of The Center for Neural Data Science
Faculty Director of The Koret Human Neurosciences Community Laboratory

2020-2023 *Post-doctoral Fellow*, University of California, San Francisco

2013–2015 *Research Assistant*, New York University Abu Dhabi

Grants and Awards

2026 *Rising Star*, Cognitive Neuroscience Society

2025 *Big Ideas in Neuroscience*, Wu Tsai Neurosciences Institute, $1,000,000

2025 *Neuroscience Fellowship Award*, Klingenstein Philanthropies, $450,000

2025 *Transdisciplinary Initiatives Program*, Maternal and Child Health Research, $200,000

2024 *Early Career Research Grant*, Whitehall Foundation, $300,000

2024 *Community of Shared Research Platforms*, Stanford University, $1,982,000

2023 *BRAIN Research Award*, The BRAIN Foundation, $178,202

2022 *Trainee Professional Development Award*, Society for Neuroscience (SfN)

2021 *Glushko Dissertation Prize*, The Cognitive Science Society

2021 *Douglas H. and Katharine Fryer Thesis Award*, New York University
(Award for Best Doctoral Thesis)

2020 *Dissertation Award*, Society for the Neurobiology of Language

2020 *Martin Braine Fellowship*, New York University

2019 *William Orr Dingwall Dissertation Fellowship*
Fellowship in the Cognitive, Clinical, and Neural Foundations of Language

2019 *Facebook PhD Fellowship*, Facebook (Finalist)

2018 *Trainee Professional Development Award*, Society for Neuroscience (SfN)

2018 *Travel Award*, Society for the Neurobiology of Language Conference

2018 *Travel Award*, Cognitive Modelling and Computational Linguistics

2017 *Travel Award*, Cognitive Computational Neuroscience Conference

2016 *Travel Award*, Society for the Neurobiology of Language Conference

2012 *Dell Hymes Commendation for Academic Achievement*, Cardiff University
(Awarded to the top graduating student within the department)

Publications

Preprints & Manuscripts

[1] Roll, N., Kries, K., Jin, F., Wang, C., Finley, AM., Sumner, M., Shain, C. & **Gwilliams, L**. (submitted). The Text Aphasia Battery (TAB): A Clinically-Grounded Benchmark for Aphasia-Like Deficits in Language Models. arxiv

[2] Gillis, M., Kries, J., Wouters, J., ***Gwilliams, L** & *Vandermosten, M.. (submitted). Neural Phoneme Processing in Children with and without Dyslexia. bioRxiv

Peer-reviewed articles

[3] Ergin, I., Kries, J., Gupta, S., Papworth Burrel, M & **Gwilliams, L**. (2026). Measuring Naturalistic Speech Comprehension in Real Time. in press at Behavior Research Methods

[4] Kries, J., *Vandermosten, M. & ***Gwilliams, L**. (2025). The spatio-temporal dynamics of phonetic encoding in aging and aphasia. *Journal of Neuroscience*. DOI: 10.1523/JNEUROSCI.1001-25.2025

[5] Bhaya-Grossman, I., Leonard, M., Zhang, Y., **Gwilliams, L**., Johnson, K., Lu, J. & Chang, E. (2025). Shared and language-specific phonological processing in the human temporal lobe. *Nature.* DOI: 10.1038/s41586-025-09748-8

[6] Zhang, Y., Leonard, M., Bhaya-Grossman, I., **Gwilliams, L**., & Chang, E. (2025). Dynamics of auditory word form encoding in human speech cortex. *Neuron*. DOI: 10.1016/j.neuron.2025.10.011

[7] **Gwilliams, L**., Marantz, A., Poeppel, D. & King, JR. (2025). Hierarchical dynamic coding coordinates speech comprehension in the brain. *Proceedings of the National Academy of Sciences.* DOI: 10.1073/pnas.2422097122

[8] Abrams, E., Marantz, A., Krementsov, I. & **Gwilliams, L**. (2025). Dynamics of pitch perception in the auditory cortex. *Journal of Neuroscience.* DOI: 10.1523/JNEUROSCI.1111-24.2025

[9] Reilly, J., ... **Gwilliams, L** ... (2025). What we mean when we say semantic: Toward a multidisciplinary semantic glossary. *Psychonomic bulletin & review.* DOI: 10.3758/s13423-024-02556-7

[10] **Gwilliams, L**., Bhaya-Grossman, I., Zhang, Y., Scott, T., Harper, S., Levy., D (2025). Computational Architecture of Speech Comprehension in the Human Brain. *Annual Reviews*. DOI: 10.1146/annurev-linguistics-031120-111245

[11] Degano, G., Donhauser, P., **Gwilliams, L**. Merlo, P., & Golestani, N. (2024). Speech prosody enhances the neural processing of syntax. *Communications Biology*. DOI: 10.1038/s42003-024-06444-7

[12] Zuanazzi, A., Ripollés, P., Lin, WM., **Gwilliams, L**., *King, JR & *Poeppel, D (2024). Negation mitigates rather than inverts the neural representations of adjectives. *PLOS Biology*. DOI: 10.1371/journal.pbio.3002622

[13] ***Gwilliams, L**., *Leonard, M.K., Sellers, K.K., Chung, J.E., Dutta, B., & Chang, E.F. (2023). Large-scale single-neuron speech sound encoding across the depth of human cortex. *Nature*. DOI: 10.1038/s41586-023-06839-2

[14] **Gwilliams, L**., Flick, G., Marantz, A., Pylkkanen, L., Poeppel, D. & King, J.R. (2023). Introducing MEG-MASC a high-quality magneto-encephalography dataset for evaluating natural speech processing. *Nature Scientific Data*. DOI: 10.1038/s41597-023-02752-5

[15] **Gwilliams, L**., Marantz, A., Poeppel, D. & King, J.R. (2023). Top-down information shapes lexical processing when listening to continuous speech. *Language, Cognition and Neuroscience*. DOI: 10.1080/23273798.2023.2171072

[16] *Chung, J.E., *Sellers, K.K., Leonard, M.K., **Gwilliams, L**., Xu, D., Dougherty, M., Kharazia, V., Welkenhuysen. M., Dutta, B., Chang, E.F. (2022). High density single-unit human cortical recordings using the Neuropixels probe. *Neuron*. DOI: 10.1016/j.neuron.2022.05.007

[17] **Gwilliams, L**., King, JR., *Marantz, A. & *Poeppel, D. (2022). Neural dynamics of phoneme sequences: Position-invariant code for content and order. *Nature Communications*. DOI: 10.1038/s41467-022-34326-1

[18] Dikker, S., Mech, EM., **Gwilliams, L**., West, T., Dumas, G. & Federmeier, KD. (2022). Exploring age-related changes in inter-brain synchrony during verbal communication. *Psychology of Learning and Motivation*. DOI: 10.1016/bs.plm.2022.08.003

[19] Iemi, L., **Gwilliams, L**., Samaha, J., Auksztulewicz, R., Cycowicz, Y., King, JR., Thesen, T., Doyle, W., Devinsky, O., Schroeder, C.E., Melloni, L. & Haegens, S. (2021). Ongoing neural oscillations influence behavior and sensory representations by suppressing neuronal excitability. *NeuroImage*. DOI: 10.1016/j.neuroimage.2021.118746

[20] ***Gwilliams, L**., *Blanco-Elorrieta, E., Marantz, A. & Pylkkänen, L. (2021). Perceptual adaptation to accented speech: prefrontal cortex aids attunement in auditory cortices. *Nature Scientific Reports*. DOI: 10.1038/s41598-020-79640-0

[21] **Gwilliams, L**. & King, JR. (2020). Recurrent processes support a cascade of hierarchical decisions. *eLife*. DOI: 10.7554/eLife.56603

[22] Dikker, S., Assaneo, F., **Gwilliams, L**., Wang, L. & Kösem, A. (2020). MEG and Language: Using Magnetoencephalography to Study the Neural Basis of Language. *Neuroimaging Clinics of North America*. DOI: j.nic.2020.01.004

[23] **Gwilliams, L**. (2020). Hierarchical oscillators in speech comprehension: A commentary on Meyer, Sun & Martin. *Language, Cognition and Neuroscience*. DOI: 10.1080/23273798.2020.1740749

[24] **Gwilliams, L**. (2019). How the brain composes morphemes into meaning. *Philosophical Transactions of the Royal Society B*. DOI: 10.1098/rstb.2019.0311

[25] Stockall, L., Manouildiou, C., **Gwilliams, L**., Neophytou, K., & Marantz, A. (2019). Prefix Stripping Re-Re-Re-visited: MEG Evidence. *Frontiers in Psychology*. DOI: 10.3389/fpsyg.2019.01964

[26] **Gwilliams, L**., & Wallisch, P. (2019). Immediate ambiguity resolution in speech perception based on prior acoustic experience. PsyArXiv

[27] **Gwilliams, L**., Linzen, T., Poeppel, D., & Marantz, A. (2018). In spoken word recognition the future predicts the past. *Journal of Neuroscience*. DOI: 10.1523/JNEUROSCI.0065-18.2018

[28] **Gwilliams, L**., Poeppel, D., Marantz, A., & Linzen, T. (2018). Phonological (un)certainty

weights lexical activation. In *Proceedings of the 8th Workshop on Cognitive Modeling and Computational Linguistics (CMCL 2018)* (pp. 29-34). arXiv

[29] **Gwilliams, L**. & Marantz, A. (2018). Morphological representations are extrapolated from morpho-syntactic rules. *Neuropsychologia*. DOI: 10.1016/j.neuropsychologia.2018.04.015

[30] Brodbeck, C., **Gwilliams, L**. & Pylkkänen, L. (2016). Language in context: MEG evidence for modality general and specific responses to reference resolution. *eNeuro*. DOI: 10.1523/ENEURO.0145-16.2016

[31] **Gwilliams, L**., & King, JR. (2017). Performance-optimized hierarchical models only partially predict neural responses during perceptual decision making. *NIPS workshop: Cognitively Informed Artificial Intelligence: Insights From Natural Intelligence* bioRxiv

[32] **Gwilliams, L**., Lewis, G. & Marantz, A. (2016). Functional characterisation of letter-specific responses in time, space and current polarity using magneto-encephalography. *NeuroImage*. DOI: 10.1016/j.neuroimage.2016.02.057

[33] Brodbeck, C., **Gwilliams, L**. & Pylkkänen, L. (2015). EEG can track the time course of reference resolution in small visual worlds. *Frontiers in Psychology*. DOI: 10.3389/fpsyg.2015.01787

[34] **Gwilliams, L**. & Marantz, A. (2015). Tracking non-linear prediction in a linear speech stream: Influence of morphological structure on spoken word recognition. *Brain and Language*. DOI: 10.1016/j.bandl.2015.04.006

[35] **Gwilliams, L**., Monahan, P., & Samuel, A. (2015). Sensitivity to morphological composition: Evidence from grammatical and lexical decision tasks. *Journal of Experimental Psychology: Language, Memory and Cognition*. DOI: 10.1037/xlm0000130

[36] **Gwilliams, L**. & Fontaine, L. (2015). Indeterminacy in process type classification. *Functions of Language*. DOI: 10.1186/s40554-015-0021-x

[37] Politzer-Ahles, S. & **Gwilliams, L**. (2015). Involvement of prefrontal cortex in scalar implicatures: Evidence from magnetoencephalography. *Language and Cognitive Neuroscience*. DOI: 10.1080/23273798.2015.1027235

Published Datasets, Corpora and Open Source Code

[1] *Lewis, G., *van Rijn, P., **Gwilliams, L**., Larrouy-Maestri, P., Poeppel, D. & Ghitza, O. NyU-BU contextually controlled stories Corpus: NUBUC. DOI: 10.5281/zenodo.4075183

[2] **Gwilliams, L**., Flick, G., Marantz, A., Pylkkanen, L., Poeppel, D. & King, J.R. (2023). Introducing MEG-MASC a high-quality magneto-encephalography dataset for evaluating natural speech processing. *Nature Scientific Data*. DOI: 10.1038/s41597-023-02752-5

[3] Waskom, M., Larson, E., Brodbeck, C., Gramfort, A., Burns, S ... **Gwilliams, L**., King, JR., Liu, D. nipy/PySurfer:0.10.0. [Link]

[4] Larson, E., Gramfort, A., Engemann, DA., Leppakangas, J., Brodbeck, C ... **Gwilliams, L**., ... mne-python-v1.2.0 [Link]

Book chapters

[1] Stockall, L. & **Gwilliams, L**. (2023). Distributed morphology and neurolinguistics. In *The Cambridge Handbook of Distributed Morphology*.

[2] **Gwilliams, L**. & Marantz, A. (2022). Neural processing of morphological structure in speech production, listening and reading. In *Current Issues in the Psychology of Language*.

[3] **Gwilliams, L**. & Davis, M.H. (2021). Extracting language content from speech sounds: The information theoretic approach. In *The Auditory Cognitive Neuroscience of Speech Perception*. Link

[4] King, JR., **Gwilliams, L**., Holdgraf, C., Sassenhagen, J., Barachant, A., Engemann, D., Larson, E. & Gramfort, A. (2020). Encoding and Decoding Framework to Uncover the Algorithms of Cognition. In *The Cognitive Neurosciences*.

Presentations

Invited talks (last 5 years)

[1] *Colloquium Speaker, Yale University*. CT, USA. (2026, May).

[2] *Keynote Speaker, Alpine Brain Imaging Meeting*. Champéry, Switzerland. (2026, January).

[3] *Invited Speaker, NeurIPS workshop: Data on the Mind and Brain*. San Diego, CA. (2025, December).

[4] *Colloquium Speaker, University of Michigan*. MI, USA. (2025, November).

[5] *Invited Speaker, ICON 2025*. Porto, Portugal. (2025, September).

[6] *Invited Speaker, ESCOP 2025*. Sheffield, UK. (2025, September).

[7] *Invited Speaker, CCN workshop 2025*. Amsterdam, Netherlands. (2025, August).

[8] *Invited Speaker, CogHear 2025*. University of Maryland. (2025, June).

[9] *Plenary address, American Psychological Association*. DC, USA. (2025, May).

[10] *Invited Speaker, ICTEAP-5*. Waseda, Japan. (2025, April).

[11] *Colloquium Speaker, UC San Diego*. CA, USA. (2025, January).

[12] *Colloquium Speaker, USC, Center for Computational Language Sciences*. CA, USA. (2024, November).

[13] *Plenary address, Society for Language Development*. Boston, MA, USA. (2024, November).

[14] *NSF workshop, New horizons in language science*. Alexandria, VA, USA. (2024, May).

[15] *University of California, Santa Cruz Colloquium Speaker*. Santa Cruz, CA, USA. (2024, April).

[16] *ARO - Association for Research in Otolaryngology. Symposium speaker*. Anaheim, CA, USA. (2024, February).

[17] *McGovern Institute Special Seminar, MIT*. Cambridge, MA, USA. (2024, February).

[18] *Colloquium Speaker, Johns Hopkins University*. Baltimore, MD, USA. (2024, February).

[19] *Keynote Speaker, Annual Meeting on Phonology (AMP)*. Online. (2023, October).

[20] *Colloquium Speaker, UC Irvine*. Irvine, CA, USA. (2023, October).

[21] *Keynote Speaker, Neurolinguistics in Sweden; Lund University*. Lund, Sweden. (2023, June).

[22] *Invited Speaker, CogHear Workshop*. Maryland, USA. (2023, June).

[23] *Colloquium Speaker, Cambridge University*. Cambridge, UK. (2023, February).

[24] *Colloquium Speaker, Queen Mary University London*. London, UK. (2023, February).

[25] *Invited Speaker, NeuroSpin*. Paris, France. (2022, December).

[26] *Special Talk Series, Max Planck Institute for Psycholinguistics*. Neurobiology of language: Key issues and ways forward II. (2022, March).

Teaching

2024-	*Instructor*, Stanford University
	Psych 1, Undergraduate
2024-	*Instructor*, Stanford University
	Data Science for Neuroscience Capstone, Undergraduate
2024-	*Instructor*, Stanford University
	Language Neuroscience Seminar, Graduate and Undergraduate

Supervision

2025-	*Xirong Hu*, PhD Student, Stanford University Psychology
2024-	*Homa Vahidi*, MD Student, Stanford University Medical School
2024-	*Atlas Kazemian*, PhD Student, Stanford University Psychology
2024-	*Caroline Kaicher*, PhD Student, Stanford University Psychology
2024-	*William Turner*, Postdoc, Stanford University Psychology
2023-	*Irmak Ergin*, PhD Student, Stanford University Psychology
2023-	*Jill Kries*, Postdoc, Stanford University Psychology
2023-2025	*Ellie Abrams*, PhD Student, New York University
2023-	*Marianne de Heer Kloots*, PhD Student, University of Amsterdam

Service

2025	Thesis Committee	Veronica Boyce, *Stanford University*
2025	Thesis Committee	Andrew Perley, *Stanford University*
2024	Thesis Committee	Linnea Evanson, *Ecole Normale Superieure*
2024	Thesis Committee	Ajay Subramanian, *Stanford University*
2024	Thesis Committee	Alicia Mason, *New York University*
2024	Dissertation Chair	Jiayi Lu, *Stanford University*
2024	Dissertation Chair	Nay San, *Stanford University*
2023	Thesis Committee	Vinay Raghavan, *Columbia University*
2023	Thesis Committee	Jill Kries, *KU Leuven*
2022	Thesis Committee	Juliett Millet, *Université de Paris*
2022	Thesis Committee	Théo Desbordes, *Meta AI & Neurospin*
2024–	DEI Representative	*Cognitive Computational Neuroscience*
2022–	Program Committee	*Cognitive Computational Neuroscience*
2025	PC Chair	*Cognitive Computational Neuroscience*
2020–2022	Review editor	*Frontiers in Psychology*
Ad-hoc	Reviewer	*Nature Neuroscience, Nature Human Behaviour, PNAS, eLife, PLOS Biology, Journal of Neuroscience, NeuroImage, Human Brain Mapping, Cognition, Frontiers in Neuroscience, Glossa, Neurobiology of Language, Experimental Psychology, European Journal of Neuroscience, Mind Brain & Education, Cerebral Cortex, Psychonomic Bulletin & Review, Brain & Language, PLOS ONE, Cortex*
Ad-hoc	Reviewer	*National Science Foundation (USA)*