

Elliot Murphy

Curriculum vitae: July 2026

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Research summary: My research uses intracranial electrophysiology in humans (sEEG, ECoG, and intraoperative Neuropixels recordings), direct cortical stimulation mapping, and theoretical modeling to uncover how the formal properties of natural language syntax and semantics are causally generated from neural mechanisms.

Research areas: Language, compositionality, neural oscillations, syntax, intracranial EEG, thalamus, language acquisition, philosophy of language, large language models

SELECTED PUBLICATIONS

- Murphy, E.**, Woolnough, O., Morse, C.W., Scherschligt, X., & Tandon, N. (2026). Frontotemporal network interactions causally support rapid concreteness judgments during reading. *PLoS Biology* 24(3): e3003723.
- Murphy, E.** (2025). ROSE: A universal neural grammar. *Cognitive Neuroscience* 16(1-4): 49–80.
- Murphy, E.**, Rollo, P.S., Segaert, K., Hagoort, P., & Tandon, N. (2024). Multiple dimensions of syntactic structure are resolved earliest in posterior temporal cortex. *Progress in Neurobiology* 241: 102669.
- Murphy, E.**, Holmes, E., & Friston, K. (2024). Natural language syntax complies with the free-energy principle. *Synthese* 203: 154.
- Murphy, E.**, Forseth, K.J., Donos, C., Snyder, K.S., Rollo, P.S., & Tandon, N. (2023). The spatiotemporal dynamics of semantic integration in the human brain. *Nature Communications* 14: 6336.
- Murphy, E.**, Woolnough, O., Rollo, P.S., Roccaforte, Z., Segaert, K., Hagoort, P., & Tandon, N. (2022). Minimal phrase composition revealed by intracranial recordings. *Journal of Neuroscience* 42(15): 3216–3227.
- Murphy, E.** (2020). *The Oscillatory Nature of Language*. Cambridge University Press.

EMPLOYMENT

- Postdoctoral Research Fellow (2021–), Research Associate (2019–21), Vivian L. Smith Department Neurosurgery, McGovern Medical School, University of Texas Health Science Center
September 2019–present
- Teaching Assistant, University College London, Department of Linguistics
January 2017–May 2019
- Visiting Lecturer, University of Westminster, Department of Psychology
October 2017–December 2018

EDUCATION

- University College London, Department of Linguistics, Faculty of Brain Sciences
2015–2020
 - PhD, Linguistics
Thesis title: *Linguistic Representation and Processing of Copredication*
Supervisors: Wing-Yee Chow, Andrew Nevins
Funded by an ESRC ‘I+3’ scholarship
- University College London, Department of Linguistics, Faculty of Brain Sciences
2014–2015
 - MSc, Language Sciences (Linguistics with Neuroscience)
Thesis title: *The Potential Role of Prediction Inhibition in Grammatically Accurate Sentence Comprehension*
Funded by an ESRC ‘I+3’ scholarship

- University College London, Department of Linguistics, Faculty of Brain Sciences
2013–2014
 - MA, Linguistics
 - Thesis title: *Computation and Continuity in the Evolution of Grammar*
- University of Nottingham, Department of English
2010–2013
 - BA, English – First-class honors
 - Thesis title: *Anarchist Tendencies in English Literature*

ACADEMIC PUBLICATIONS

Books

Unmaking Merlin: Anarchist Tendencies in English Literature. Zero Books, 2014.
The Oscillatory Nature of Language. Cambridge University Press, 2020.
Arms in Academia: The Political Economy of the Modern UK Defence Industry. Routledge, 2020.
Logical and Causal Foundations of Language. [In preparation]

Peer Reviewed Papers

2026:

Murphy, E., Morosi, P., Leivada, E., & Nevins, A. Machine yearning: LLMs do not capture formal linguistic structure and obscure neuroscientific inquiry. *Behavioral and Brain Sciences* 49: e198. 58–59.
 Yang, Q., **Murphy, E.**, Yang, C., Liao, Y., & Hu, J. Neural mechanisms of structural inference: An EEG investigation of linguistic phrase structure categorization. *Brain & Language* 279: 105784.
Murphy, E., Woolnough, O., Morse, C.W., Scherschligt, X., & Tandon, N. Frontotemporal network interactions causally support rapid concreteness judgments during reading. *PLoS Biology* 24(3): e3003723.
Murphy, E. Resurrections and insurrections in the neurobiology of language. *Biolinguistics* 20: e21469.
 Baggio, G., & **Murphy, E.** On the referential capacity of language models: An internalist rejoinder to Mandelkern & Linzen. *Computational Linguistics* 1–10. <https://doi.org/10.1162/COLI.a.601>.
 Murphy, E. Frege in the flesh: Biolinguistics and the neural enforcement of syntactic structures. arXiv:2604.00291. [Forthcoming, *The Routledge Handbook of Syntax*, 2nd edition, eds. Andrew Carnie, Dan Siddiqi, Yosuke Sato]
 Uluslu, A.Y., & **Murphy, E.** Neurocomputational mechanisms of syntactic transfer in bilingual sentence production. arXiv:2601.18056. [Under review, *Journal of Neurolinguistics*]
 Leivada, E., Dentella, V., & **Murphy, E.** The quo vadis of the relationship between language and large language models. In Mendiñil-Giró, J.-L. (ed.), *Artificial Knowledge of Language: A Linguists' Perspective on Its Nature, Origins and Use*. Vernon Press.
 Leivada, E., Marcus, G., Günther, F., & **Murphy, E.** A sentence is worth a thousand pictures: can large language models understand human Language and the World behind Words? *Philosophical Transactions of the Royal Society A* 384(2320): 20250008.

2025:

Murphy, E. ROSE: A universal neural grammar. *Cognitive Neuroscience* 16(1-4): 49–80.
 Murphy, E. Beyond prediction: comments on the format of natural intelligence. *Cognitive Neuroscience* 16(1-4): 37–40.
Murphy, E., de Villiers, J., & Morales, S.L. A comparative investigation of compositional syntax and semantics in DALL-E and young children. *Social Sciences & Humanities Open* 11: 101332.
Murphy, E., Leivada, E., Dentella, V., Montero, R., Günther, F., & Marcus, G. Fundamental principles of linguistic structure are not represented by ChatGPT. *Biolinguistics* 19: e19021.
Murphy, E. The nature of language and the structure of reality. In Benítez-Burraco, A., López, I.F., Fernández-Pérez, M., & Ivanova, O. (eds.), *Biolinguistics at the Cutting Edge: Promises, Achievements, and Challenges*. Berlin: De Gruyter Mouton. 207–236.

Snyder, K., Forseth, K., Woolnough, O., **Murphy, E.**, Hickok, G., & Tandon, N. Shared cortical language networks with convergent hierarchical network dynamics for lexicosemantic processing in comprehension and naming. *Neurosurgery* 71(1): 213.

Murphy, E., Venkatesh, R., Khokhlovich, E., & Vyshedskiy, A. Merge-based syntax is mediated by distinct neurocognitive mechanisms: A clustering analysis of comprehension abilities in 84,000 individuals with language deficits across nine languages. *Scientific Reports* 15: 44444.

Murphy, E. Time slows down in the future: Aging and the brain rhythms of language. *Topics in Cognitive Science* <https://doi.org/10.1111/tops.70019>.

2024:

Murphy, E., Rollo, P.S., Segaert, K., Hagoort, P., & Tandon, N. Multiple dimensions of syntactic structure are resolved earliest in posterior temporal cortex. *Progress in Neurobiology* 241: 102669.

Dentella, V., Günther, F., **Murphy, E.**, Marcus, G., & Leivada, E. Testing AI on language comprehension tasks reveals insensitivity to underlying meaning. *Scientific Reports* 14: 28083.

Murphy, E. ROSE: A neurocomputational architecture for syntax. *Journal of Neurolinguistics* 70: 101180.

Murphy, E. Predicate order and coherence in copredication. *Inquiry* 67(6): 1744–1780.

Murphy, E., Holmes, E., & Friston, K. Natural language syntax complies with the free-energy principle. *Synthese* 203: 154.

Murphy, E. What is a word? arXiv:2402.12605.

Murphy, E., & Woolnough, O. The language network is topographically diverse and driven by rapid syntactic inferences. *Nature Reviews Neuroscience* 25: 705.

2023:

Murphy, E., Forseth, K.J., Donos, C., Snyder, K.S., Rollo, P.S., & Tandon, N. The spatiotemporal dynamics of semantic integration in the human brain. *Nature Communications* 14: 6336.

McCarthy*, M.J., **Murphy***, E., Scherschligt, X., Woolnough, O., Morse, C.W., Snyder, K., Mahon, B.Z., & Tandon, N. Intraoperative cortical localization of music and language reveals signatures of structural complexity in posterior temporal cortex. *iScience* 26(7): 107223.

Murphy, E. Animals sick with language: From syntax to socialism in Nietzsche. *Nietzsche and the Politics of Reaction: Essays on Liberalism, Socialism, and Aristocratic Radicalism*. (Ed. Matthew McManus). London: Palgrave Macmillan. 263–286.

Murphy, E. The citadel itself: Defending semantic internalism. *Global Philosophy* 33: 7.

Benítez-Burraco, A., Hoshi, K., & **Murphy, E.** Language deficits in GRIN2A mutations and Landau-Kleffner syndrome as neural dysrhythmias. *Journal of Neurolinguistics* 67: 101139.

Woolnough, O., Donos, C., **Murphy, E.**, Rollo, P.S., Roccaforte, Z., Dehaene, S., & Tandon, N. Spatiotemporally distributed frontotemporal networks for sentence reading. *Proceedings of the National Academy of Sciences of the United States of America* 120(17): e2300252120.

Leivada, E., **Murphy, E.**, & Marcus, G. DALL-E 2 fails to reliably capture common syntactic processes. *Social Sciences & Humanities Open* 8(1): 100648.

Murphy, E. A future without a past: philosophical consequences of Merge. *Biolinguistics* 17: e13067.

2022:

Murphy, E., Hoshi, K., & Benítez-Burraco, A. Subcortical syntax: Reconsidering the neural dynamics of language. *Journal of Neurolinguistics* 62: 101062.

Murphy, E., Woolnough, O., Rollo, P.S., Roccaforte, Z., Segaert, K., Hagoort, P., & Tandon, N. Minimal phrase composition revealed by intracranial recordings. *Journal of Neuroscience* 42(15): 3216–3227.

Murphy, E., & Leivada, E. A model for learning strings is not a model of language. *Proceedings of the National Academy of Sciences* 119(23): e2201651119.

Leivada, E., & **Murphy, E.** A demonstration of the uncomputability of parametric models of language acquisition and a biologically plausible alternative. *Language Development Research* 2(1): 105–138.

Murphy, E. Review of *Reflections on Language Evolution: From Minimalism to Pluralism* by Cedric Boeckx. *Journal of Linguistics* 58(4): 907–911.

Murphy, E. Copredication and complexity revisited: A reply to Löhr and Michel. *Cognitive Science* 46: e13207.

2021:

- Leivada, E., & **Murphy, E.** Mind the (terminological) gap: 10 misused, ambiguous, or polysemous terms in linguistics. *Ampersand* 8: 100073.
- Forseth, K., **Murphy, E.**, Bullock, L., & Tandon, N. Reading in the brain: Distributed network dynamics for written language. *Journal of Neurosurgery* 132(2): 5.
- Murphy, E. Persistence conditions of institutional entities: Investigating copredication through a forced-choice experiment. *Frontiers in Psychology* 12: 528862. Research Topic: 'Experimental Approaches to Pragmatics'.

2020:

- Murphy, E. Language design and communicative competence: The minimalist perspective. *Glossa: A Journal of General Linguistics* 5(1): 2.
- Murphy, E., & Shim, J.-Y. Copy invisibility and (non-)categorial labeling. *Linguistic Research* 37(2): 187–215.
- Murphy, E. Commentary: A compositional neural architecture for language. *Frontiers in Psychology* 11: 2101.

2019:

- Benítez-Burraco, A., & **Murphy, E.** Why brain oscillations are improving our understanding of language. *Frontiers in Behavioral Neuroscience* 13: 190.
- Murphy, E. Anarchism and science. *The Palgrave Handbook of Anarchism*. Carl Levy & Matthew S. Adams (Eds). London: Palgrave Macmillan. 193–209.
- Murphy, E. Acceptability properties of abstract senses in copredication. Bolognesi, M., & Steen, G. (Eds). *Perspectives on Abstract Concepts: From Cognitive Processing to Semantic Representation and Linguistic Expression*. Human Cognitive Processing Series. Amsterdam: John Benjamins. 145–165.
- Murphy, E. No country for Oldowan men: Emerging factors in language evolution. *Frontiers in Psychology* 10: 1448.

2018:

- Murphy, E.**, & Benítez-Burraco, A. Paleo-oscillomics: Inferring aspects of Neanderthal language abilities from gene regulation of neural oscillations. *Journal of Anthropological Sciences* 96: 111–124.
- Murphy, E. Interfaces (travelling oscillations) + recursion (delta-theta code) = language. Luef, E., & Marin, M. (Eds). *The Talking Species: Perspectives on the Evolutionary, Neuronal and Cultural Foundations of Language*. Graz: Unipress Graz Verlag. 251–269.
- Murphy, E.**, & Benítez-Burraco, A. Toward the language oscillogenome. *Frontiers in Psychology* 9: 1999.
- Murphy, E. No country for Oldowan men: Self-domestication and cranial globularity as factors in language evolution. *UCL Working Papers in Linguistics* 30: 35–56.
- Murphy, E. A domesticated code: On the emergence of the oscillatory basis of phrase structure. Cuskey, C., Flaherty, M., McCrohon, L., Little, H., Ravnani, A., & Verhoef, T. (Eds). *The Evolution of Language: Proceedings of the 12th International Conference (Evolang 12)*. Torun: Nicolaus Copernicus University. 335–338.
- Murphy, E. Anarchy and identity: On power and loneliness in the works of John Cowper Powys. *The Powys Journal* 28: 120–139.

2017:

- Murphy, E. Acquiring the impossible: Developmental stages of copredication. *Frontiers in Psychology* 8: 1072.
- Murphy, E.**, & Benítez-Burraco, A. Language deficits in schizophrenia and autism as related oscillatory connectopathies: An evolutionary account. *Neuroscience & Biobehavioral Reviews* 83: 742–764.
- Murphy, E. Implications of travelling weakly coupled oscillators for the cortical language circuit. *UCL Working Papers in Linguistics* 29: 24–29.

2016:

- Benítez-Burraco, A., & **Murphy, E.** The oscillopathic nature of language deficits in autism: From genes to language evolution. *Frontiers in Human Neuroscience* 10: 120.
- Murphy, E. The human oscillome and its explanatory potential. *Biolinguistics* 10: 6–20.
- Murphy, E. Phasal eliminativism, anti-lexicalism, and the status of the unarticulated. *Biolinguistics* 10: 21–50.
- Murphy, E. An oscillomic approach to the human cognitive phenotype: Philosophical and empirical reflections. *York Papers in Linguistics, Proceedings of the third Postgraduate and Academic Researchers in Linguistics at York (PARLAY 2015) conference* 3: 30–39.

- Murphy, E. Evolutionary monkey oscillomics: Generating linking hypotheses from preserved brain rhythms. *Theoretical Linguistics* 42(1-2): 117-137.
- Benítez-Burraco, A., Lattanzi, W., & **Murphy, E.** Language impairments in ASD resulting from a failed domestication of the human brain. *Frontiers in Neuroscience* 10: 373.
- Murphy, E.,** & Benítez-Burraco, A. Bridging the gap between genes and language deficits in schizophrenia: An oscillopathic approach. *Frontiers in Human Neuroscience* 10: 422.
- Murphy, E. A pragmatic oscillome: Aligning visual attentional mechanisms with language comprehension. *Frontiers in Systems Neuroscience* 10: 72.
- Murphy, E. A theta-gamma neural code for feature set composition with phase-entrained delta nestings. *UCL Working Papers in Linguistics* 28: 1–23.
- Wilkinson, C., & **Murphy, E.** Joint interventions in autism spectrum disorder: Relating oscillopathies and syntactic deficits. *UCL Working Papers in Linguistics* 28: 1–7.

2015:

- Murphy, E. Review of *Elementary Syntactic Structures: Prospects of a Feature-Free Syntax* by Cedric Boeckx. *Journal of Linguistics* 51(3): 682–685.
- Murphy, E. Labels, cognomes and cyclic computation: An ethological perspective. *Frontiers in Psychology* 6: 715.
- Murphy, E. Reference, phases and individuation: Topics at the labeling-interpretive interface. *Opticon* 1826 17(5): 1–13.
- Murphy, E. The brain dynamics of linguistic computation. *Frontiers in Psychology* 6: 1515.
- Murphy, E. Neural substrates of copredication: When an unstoppable scan meets an impossible object. *York Papers in Linguistics, Proceedings of the second Postgraduate and Academic Researchers in Linguistics at York (PARLAY 2014) conference*: 75–88.

2014:

- Murphy, E. Review of *Definite Descriptions* by Paul Elbourne. *The Linguistic Review* 31(2): 435–444.
- Murphy, E. Joyce on nationality, language and religion. *Innervate* 5: 39–45.

In preparation

- Murphy, E., & Tandon, N. Formal properties of language as constraints on neural dynamics.
- Murphy, E., & Tandon, N. The map is not the mechanism: Why LLM-brain alignments fail to explain the neurobiology of language.
- Murphy, E., McCarty, M., Ilyas, A., & Tandon, N. Thalamocortical effects of induced and natural loss of consciousness in the human brain.
- Murphy, E., & Tandon, N. Ethical considerations in human intracranial and neurotechnology research.
- Maerean, N., Forseth, K.J., Murphy, E., & Tandon, N. Cortical processing of object and action naming.
- Riddle, J., & Murphy, E. The delta-beta neural program: Aligning phrase structure inference and prediction with abstract decision-making.
- McCarty, M., Woolnough, O., Snyder, K., Murphy, E., & Tandon, N. Cortical dynamics of flexible object-based attention.
- Murphy, E., Venkatesh, R., Khokhlovich, E., & Vyshedskiy, A. Non-figurative and figurative drawing abilities map onto distinct cognitive mechanisms in a clinical cohort of over 77,000 participants: implications for the evolution of symbolic thought.

Other academic writings

- Marcus, G., & Murphy, E. (2022). Three ideas from linguistics that everyone in AI should know. [Garymarcus.substack.com](https://garymarcus.substack.com). 22 June.

SCHOLARSHIPS

- ESRC “1+3 scholarship” with full stipend and covering all tuition fees (MSc + PhD, Department of Linguistics, UCL, 2014-2018).

RESEARCH GRANTS

NIH K99/R00 (2025; PI/candidate; scored application). 'Isolating syntactic information through joint intracranial and aphasiological assessments'.

BRAIN Initiative R61 (submitted, June 2026). 'Thinking fast and slow: Ultrascale spatiotemporal mapping of the neural code for meaning' (PI: Nitin Tandon). Roles: Writing, experimental design, hypothesis formation, pilot data analysis.

PRIZES

Bursary to visit the Department of Linguistics, University of Barcelona, to give a lecture on MA thesis (from Department of Linguistics, UCL, 2014).

Best PhD presentation, 7th International Conference on Intercultural Pragmatics and Communication (INPRA 2016). University of Split. 10-12 June.

Bursary to visit CUNY 2017, MIT, awarded by the conference organisers.

2022 President's Award for Excellence in Postdoctoral Research. University of Texas Health Science Center, 4 August (1st Place, \$3000).

CONFERENCE ORAL PRESENTATIONS

2014:

Neural substrates of copredication: When an unstoppable scanner meets an impossible object. Talk at the 2nd Postgraduate Academic Researchers in Linguistics Conference. University of York. 12 September.

2015:

Phasal eliminativism, conceptual adicity and the view from the CI system. Talk at Manchester Semantics and Pragmatics 2015. University of Manchester. 29 July.

Rhythmic syntax: Neural oscillations, linguistic interpretation and the prospects for an algorithmic-implementation settlement. Talk at the 2nd Postgraduate Academic Researchers in Linguistics Conference. University of York. 11 September.

2016:

Conjoining dotted types and ordering constraints in copredication. 2016 PPG Cumberland Lodge Conference, Windsor Great Park. 11 April.

Processing and acceptability features of copredication. Birmingham English Language Postgraduate conference (BEP), University of Birmingham. 15 April.

Processing and acceptability properties of predicate ordering effects in copredication. Olomouc Linguistics Colloquium (Olinco) 2016, Palacký University. 9-11 June.

Grammar-meaning alignment and unarticulated constituents. 7th International Conference on Intercultural Pragmatics and Communication (INPRA 2016). University of Split. 10-12 June.

2017:

A tale of two workspaces: Delta-theta and theta-gamma interactions as phrasal and lexical memory buffers. 2017 PPG Cumberland Lodge Conference, Windsor Great Park. 24 April.

2018:

A domesticated code: On the emergence of the oscillatory basis of phrase structure. EvoLang XII, Torun, Poland. 17 April.

2021:

Murphy, E., Forseth, K., & Tandon, N. Reading in the brain: distributed network dynamics for written language. American Association of Neurological Surgeons annual meeting (AANS 2021), Orlando, Florida. 21 August.

Woolnough, O., **Murphy, E.**, Rollo, P., Donos, C., Dehaene, S., & Tandon, N. Spatiotemporal dynamics of sentence reading. Society for the Neurobiology of Language annual meeting. 5-8 October.

Murphy, E., Forseth, K.J., Rollo, Patrick S., Roccaforte, Z., & Tandon, N. The role of the medial parietal cortex in referring to common objects. Society for the Neurobiology of Language annual meeting. 5-8 October.

2023:

Murphy, E., Woolnough, O., Morse, C., & Tandon, N. Human intracranial signatures of syntax without conceptual semantics. Neuroscience 2023 (Society for Neuroscience Annual Meeting). Nanosymposium talk (Neural Circuits and Mechanisms of Language and Cognition). 12 November.

2026:

Murphy, E. Some material consequences of ROSE. Interdisciplinary Frontiers in Biolinguistics conference. Beijing, China. 11 July.

INVITED LECTURES

2014:

Labels, cognition and evolution: Converging themes. Biolinguistics Initiative Barcelona, University of Barcelona. 4 November. Invite from Cedric Boeckx.

2015:

Islands of interpretation: The potential role of prediction inhibition in grammatically accurate sentence comprehension. University College London Neuroscience Society. University College London. 24 April. Invite from society members.

Frequency-coupling and gamma-band synchronisation as possible substrates of linguistic computation. Invited talk for the Theoretical Neurobiology reading group, Wellcome Trust Centre for Neuroimaging. 22 September. Invite from Karl Friston.

2016:

The oscillopathic nature of language deficits in autism and schizophrenia. Cognitive Syntax reading group, University College London, 15 February. Invite from Rosemary Varley.

Phasal eliminativism, anti-lexicalism, and the status of the unarticulated. Pragmatics reading group, University College London, 11 May. Invite from Louis Pollock.

Acceptability properties of copredication and their theoretical implications. PhD Day talk, Department of Linguistics, University College London, 24 May. Invite from the Faculty.

When an unstoppable scanner meets an impossible object. UCL, Bloomsbury and East London ESRC DTP, 7 November. Invite from the ESRC.

2017:

A tale of two workspaces: Relating brain rhythms and phrase structures. One-day workshop: *Brain Oscillations: From Function to Cognitive Disease*. Faculty of Biology, University of Seville. 24 May. Invite from Antonio Benítez-Burraco.

2018:

An oscillatory account of musical and linguistic rhythm. Language in Music and Cognition lecture series. University of Cologne. 8 November. Invite from Rie Asano.

Interfaces (travelling oscillations) + recursion (delta-theta code) = language. Max Planck Institute for Human and Cognitive Brain Sciences, 6 December. Invite from Angela Friederici.

2019:

(Non-)categorical labeling and resource restriction. The Third International Workshop on Syntactic Cartography (IWSC2019). Beijing Language and Culture University, 26-27 October. Invite from Fuzhen Si.

2020:

A neurocomputational perspective on syntax. Abrialin ao Vivo – Linguists Online. 19 July. Invite from Miguel Oliveira. [available on YouTube]

Natural language syntax, active inference and the hidden states of the world. Part of the 'Current Topics in Language Neural Processing' symposium. XVI Annual Meeting of the Chilean Society of Neuroscience. 10-12 November. Invite from Ana Campos Espinoza.

2021:

Natural language complies with the free-energy principle. Theoretical Neurobiology research group, Wellcome Centre for Human Neuroimaging, University College London. 5 January. Invite from Karl Friston.

Natural language syntax complies with the free-energy principle. Active Inference GuestStream #004.I. 14 April. Invite from Daniel A. Friedman. [*available on YouTube*]

Neural dynamics of language and developmental stages. International Workshop on Language in Healthy and Pathological Aging. 29 April. Invite from Olga Ivanova.

Internalist investigations of representation and reference: Copredication as a case study. Lecture delivered to the 'Meaning and Grammar' research group seminar. School of Philosophy, Psychology and Language Sciences, University of Edinburgh. 2 November. Invite from Vilde Reksnes and Zack Zhengjie Situ.

2022:

Meaning in the brain: combination, concreteness, coherence. Talk presented at Neuroscience 2022, 10th Annual Neuroscience Conference (Labroots). 10 March. Invite from the NIH BRAIN Initiative Planning Committee.

A cortical mosaic for linguistic structure: insights from intracranial recordings. Talk delivered to the Language Acquisition and Language Processing Lab at the Norwegian University of Science and Technology. 1 June. Invite from Giosuè Baggio.

Cracking the neural code for syntax. Talk delivered to the College of Biomedical Engineering and Instrument Sciences, Zhejiang University. 14 October. Invite from Nai Ding.

Natural language syntax and active inference. Talk delivered to the Studies in Modern Grammar reading group at the Department of English Language & Literature, Gyeongsang National University, South Korea. Invite from Jae-Young Shim.

2023:

Meaning in the brain: Using intracranial recordings to map the neural basis of language. Medical School Retreat Lecture. McGovern Medical School, UTHealth. 7 March. Invite from the organizers.

Spatiotemporal dynamics of linguistic structure in the human brain. University of Bristol, School of Psychological Science. 29 March. Invite from Nina Kazanina.

Spatiotemporal dynamics of syntactic structure and semantic integration. Sounds-Speech-Language workshop. New York University, Center for Language, Music and Emotion (CLaME). 14 April. Invite from David Poeppel.

2024:

ROSE: A neurocomputational architecture for syntax. NCCR Evolving Language, University of Geneva. 27 May. Invite from Nina Kazanina and Valentina Borghesani.

Enhancing generative models of syntax with the language of statistical physics. Zhejiang University, China. 4 June. Invite from Nai Ding.

ROSE and Turing-Chomsky Compression: Enhancing generative models of syntax with the language of statistical physics and brain dynamics. Linguae ML, École Normale Supérieure. 18 June. Invite from Yair Lakretz.

2025:

Intracranial insights into the nature of linguistic composition. Cognitive Brain Mapping Group, Northwestern University. 15 January. Invite from Antonio Santa Cruz.

If the nature of experiential content is beyond our science-forming faculties, then so is consciousness. University of Arizona, The Center for Consciousness Studies. 6 May. Invite from Tom Bever.

The merge hypothesis through the lens of statistical physics. Syntax Workshop. Linguistics Department, University of Massachusetts at Amherst. 8 May. Invite from Jill de Villiers.

ROSE: A universal neural grammar. Workshop on 'Mathematics in Generative Linguistics'. California Institute of Technology. 31 May – 1 June. Invite from Matilde Marcolli.

Searching for the neural code for syntax. The 4th Conference on Biolinguistics and Language Acquisition, Beijing Foreign Studies University. 22 June. Invite from Edward Ruoyang Shi.

Intracranial investigations of compositional syntactic structures: the search for a universal neural grammar. Conferences on 'LLMs and the Brain' at Rice University. 26 September. Invite from Ben Hayden.

Logical and Causal Foundations of Language: ROSE as a Candidate Model for Universal Neural Grammar. Neuroscience & Philosophy Salon lecture. 5 November. Invite from Luiz Pessoa. [available on YouTube]

Platonic Forms in the Study of Language and Mind. Symposium on the Platonic Space. 16 December. Invite from Michael Levin. [available on YouTube]

POSTER PRESENTATIONS

2015:

Individuation and abstraction: A neurolinguistic perspective. UCL Neuroscience Symposium. 19 June.

Chow, W-Y., **Murphy, E.**, & Baptist, M. To predict, or not to predict?: An investigation into prediction inhibition during language comprehension. UCL Neuroscience Symposium. 19 June.

Rethinking universality: Neural oscillations and linguistic interpretation. Psylex IV, University of Zaragoza. 22-23 October.

Copredication and dot-type individuation as insights into semantic processing. UCL ESRC DTC Welcome Event. 12 November.

2016:

Oscillatory frequency-coupling and phase locking as the substrates of phrase structure building. ConsSOLE XXIV, University of York. 6-8 January.

Murphy, E., & Benítez-Burraco, A. The oscillopathic nature of language deficits in schizophrenia and autism: From genes to language evolution. Nijmegen Lectures, Max Planck Institute for Psycholinguistics. 20-22 January.

Labels and rhythms: Human-specific hierarchies of neural oscillations as the source of linguistic computation. Sheffield Postgraduate Conference in Linguistics. 27 January.

Benítez-Burraco, A., Lattanzi, W., & **Murphy, E.** Genetics of language deficits in schizophrenia and autism: An evolutionary approach. European Conference of Human Genetics. CCIB, Barcelona. 21-24 May.

Why language and vision might not be that different. Knowledge Exchange event, British Museum. 15 June.

Acceptability features of copredication: Conceptualizing books, cities, and lunches. UCL Neuroscience Symposium. 24 June.

Murphy, E., & Benítez-Burraco, A. From oscillopathies to neural entrainment: Using language deficits in autism and schizophrenia to (re)construct a neural model of linguistic computation. Society for the Neurobiology of Language Annual Meeting 2016. 17-20 August.

A beta-gamma neural code for linguistic feature-set composition. Cell Symposia: Big Questions in Neuroscience, San Diego. 10-11 November.

Acceptability properties of abstract senses in copredication. Abstract Concepts International Symposium, Amsterdam. 18 November.

2017:

Predicate ordering effects in copredication. 30th CUNY Conference on Human Sentence Processing. Massachusetts Institute of Technology, Boston. 30 March-1 April.

Dual workspaces and dual phase codes in the neural implementation of linguistic memory buffers. UCL Neuroscience Symposium. London. 16 June.

Wilkinson, C., & **Murphy, E.** Joint interventions in autism spectrum disorder. European Congress of Psychology. Amsterdam. 11-14 July.

Murphy, E., & Benítez-Burraco, A. Language evolution through the lens of ASD: An oscillatory approach. European Society of Evolutionary Biology. 20-25 August.

Tracking the developmental stages of copredication. AMLaP 2017, Lancaster University. 7-9 September.

Murphy, E., & Benítez-Burraco, A. From oscillopathies to neural entrainment: Using language deficits in autism and schizophrenia to (re)construct an oscillatory model of linguistic computation. Imperial Neuroscience Research Day (INeRD), London. 20 September.

Developmental stages of complex polysemy: Libraries, lunches, and Theseus. Many Paths to Language (MPaL), Max Planck Institute for Psycholinguistics. 6-8 October.

2018:

Oscillatory basis of complex polysemy in copredication. PhD Day, Department of Linguistics, University College London, 18 May.

Grounding relevance theory in oscillatory dynamics. X. Dubrovnik Conference on Cognitive Science: Communication, Pragmatics, and Theory of Mind. 24-27 May.

2020:

Murphy, E., Forseth, K.J., Rollo, P.S., Roccaforte, Z., & Tandon, N. Electrophysiological dynamics of referential versus non-referential semantics. BRAIN Initiative Investigator's Meeting. 1-2 June.

Murphy, E., Woolnough, O., Rollo, P., Roccaforte, Z., & Tandon, N. Minimal syntactic composition in electrocorticography. Society for the Neurobiology of Language Annual Meeting. 21-24 October.

2021:

Murphy, E., Forseth, K.J., Rollo, P.S., Roccaforte, Z., & Tandon, N. Referential semantics implicates medial parietal cortex and hippocampus in electrocorticography. Society for Neuroscience Global Connectome. 11-13 January.

Woolnough, O., **Murphy, E.**, Rollo, P., Donos, C., Dehaene, S., & Tandon, N. Spatiotemporal dynamics of sentence reading. Society for the Neurobiology of Language, 13th Annual Meeting. 5-8 October.

Murphy, E., Forseth, K.J., Rollo, P.S., Roccaforte, Z., & Tandon, N. The role of the medial parietal cortex in referring to common objects. Society for the Neurobiology of Language, 13th Annual Meeting. 5-8 October.

Murphy, E., Forseth, K.J., Rollo, P.S., Roccaforte, Z., & Tandon, N. Intracranial recordings of reference to common objects. Neuroscience 2021, 50th Annual Meeting of SfN. 8-12 November.

Maerean, N., Forseth, K., **Murphy, E.**, & Tandon, N. Distinct nodal responses for verbs in the production network. Neuroscience 2021, 50th Annual Meeting of SfN. 8-12 November.

Woolnough, O., **Murphy, E.**, Rollo, P., Donos, C., Dehaene, S., & Tandon, N. Spatiotemporal brain dynamics of sentence reading. Neuroscience 2021, 50th Annual Meeting of SfN. 8-12 November.

2022:

Murphy, E., Forseth, K.J., Rollo, P.S., & Tandon, N. Intracranial insights into lexical access. 8th Annual BRAIN Initiative Meeting. 21-22 June.

Murphy, E., Woolnough, O., Morse, C., Scherschligt, X., & Tandon, N. Spatiotemporal dynamics of concreteness. Society for the Neurobiology of Language Annual Meeting. 6-8 October.

Murphy, E., Woolnough, O., Morse, C., Scherschligt, X., & Tandon, N. Probing local cortical signatures of perceptible and imperceptible concepts. Human Single Neuron Meeting. 10-11 November.

Murphy, E., Woolnough, O., Morse, C., Scherschligt, X., & Tandon, N. Mapping the concreteness network with intracranial recordings and cortical stimulation. Neuroscience 2022 (Society for Neuroscience Annual Meeting). 12-16 November.

2023:

Morales, S.L., de Villiers, J., & **Murphy, E.** Benchmarking language acquisition in artificial intelligence against children. Smith College, New York, student poster competition. April.

2024:

Murphy, E., McCarty, M., Jinlong, L., Savarraj, J., Ilyas, A., Wheeler, E., & Tandon, N. Thalamocortical profile of propofol-induced loss of consciousness and wakefulness in the human brain. Society for the Neurobiology of Language Annual Meeting. 8 October.

2025:

Leivada, E., **Murphy, E.**, & Ramchand, G. Of models, mice, and men: A Lennebergian approach to the predictions of Generative Grammar for the limitations of language modelling. CGG34. 7-9 May.

Murphy, E., Woolnough, O., & Tandon, N. Intracranial signatures of syntax in the absence of conceptual semantics are isolated from non-linguistic recursive representations in frontotemporal language sites. Society for the Neurobiology of Language Annual Meeting. 12 September.

Murphy, E., Woolnough, O., & Tandon, N. Intracranial signatures of conceptual features are invariant of subjective semantic judgements. Society for Neuroscience Annual Meeting. 16 November.

2026:

Uluslu, A.Y., & **Murphy, E.** Neurocomputational mechanisms of syntactic transfer in bilingual sentence production. Workshop 'Bilingual language processing: Bridging human and artificial cognition' (BiLaP 2026). 13 March.

PANEL DISCUSSIONS AND CONVERSATIONS

2019:

First Steps into Open Science (Webinar). Keele University Psychology Postgraduate Affairs Group, 27 August.
Current Issues in Biolinguistics and Brain Sciences. The Third International Workshop on Syntactic Cartography. Beijing Language and Culture University, 26-27 October.

New Trends of Development in Linguistics and Strategies for Developing a New Department of Linguistics. The Third International Workshop on Syntactic Cartography (IWSC2019). Beijing Language and Culture University, 26-27 October.

2021:

Recent Progress Mapping the Neurobiology of Language. Discussant with Gregory Hickok. 21 June. Abrialin ao Vivo – Linguists Online. Invite from Miguel Oliveira. [available on YouTube]

2023:

A conversation on Chomsky & Large Language Models ~ Elliot Murphy & Steven T. Piantadosi. Active Inference GuestStream #041.1. 25 April. [available on YouTube]

2025:

Conversation with Michael Levin. 18 September. [available on YouTube]

2026:

The Secret to Human Thought AI Will Never Understand. Conversation with Jack Roycroft-Sherry. 20 March. [available on YouTube]

Platonic Space discussion #4, with Michael Levin and colleagues. 25 May. [available on YouTube]

SUPERVISION AND MENTORSHIP

PhD student co-supervisor (Ahmet Yavuz Uluslu, Institute for Computational Linguistics, University of Zurich):
(i) Tracing Native Language Influence: From Biological Mechanisms to Large Language Models. 2026 – present.

MD-PhD student mentor (Carmen Zavala, Dept. of Neurosurgery, UTHealth): (i) Role of thalamo-cortical interactivity in language; (ii) Mapping cortico-cortical evoked potentials in intracranial recordings. January 2025 – present.

PhD student mentor (Love Zackrisson): (i) Interactional connectivity dynamics in intracranial language recordings. August 2024 – present.

PhD student mentor (Meredith McCarty, Neuroscience PhD candidate: Dept. of Neurosurgery, UTHealth): (i) Inter-areal cortical dynamics of attention; (ii) Measuring syntactic complexity. February 2021 – December 2025.

MD-PhD student mentor (Kathryn M. Snyder, Dept. of Neurosurgery, UTHealth): (i) Cortical network dynamics of lexical access in speech production; (ii) The critical role of the ventral temporal lobe in word retrieval. October 2021 – July 2025.

Undergraduate student mentor (Nora Maereen, Psychology major: Department of Psychological Sciences, Rice University; transitioning to Baylor College of Medicine): Cortical dynamics of verb argument structure. March 2021 – July 2023.

Research assistant (Xavier Scherschligt): (i) Analyzing neural time series data; (ii) Mapping musical complexity. June 2021 – May 2022.

TEACHING (UNIVERSITY)

Interfaces in Syntax (PLING223/PLING227), Department of Linguistics, University College London. Joint BA and MA/MSc students. Spring semester, 2017. Instructor: Ad Neeleman.

Introduction to Language (PLIN1302), Department of Linguistics, University College London. BA students. Autumn semester, 2017. Autumn semester, 2018. Instructor: Kearsy Cormier.

Core Issues in Linguistics (PLIN0007), Department of Linguistics, University College London. BSc students. Autumn semester 2018, Spring semester 2019. Instructor: Kriszta Szendrői.

Biological Psychology (4PSYC003W), Department of Psychology, University of Westminster. BA students. Spring semester, 2018. Instructor: David Williams.

Cognitive Psychology (4PSYC002W), Department of Psychology, University of Westminster. BA students. Autumn semester, 2018. Instructor: Laura Boupert.

'Relations between language and thought' (Gleitman & Papafragou 2013): Reflections and updates. Invited lecture for undergraduate Linguistics students at the Faculty of Education, Alberto Hurtado University, Chile. 7 October, 2021. Invitation from Pablo Silva Ríos.

Neural enforcement of conscious states. University of Arizona, The Center for Consciousness Studies, Undergraduate Honors program. 7 April 2026. Invitation from Tom Bever.

Using Neural Oscillations to Study the Faculty of Language: Mathematics, Methods, Theory, Practice. Two-day intensive workshop on neural oscillations. 27-28 May 2026. Universidade Federal do Rio de Janeiro. Invitation from Anieli França.

TEACHING (SCHOOL)

English literature A-Level guest lecture, 'Anarchist fiction: Its history and prospects'. Latymer Upper School. 16 January 2015.

Teaching assistant for special educational needs (SEN) school. Halton House School, Runcorn, Merseyside. January – May 2019.

Private tutor (2015–2019): A-Level English, History; GCSE English, History, Mathematics, Chemistry, Physics.

'What do we mean by intelligence?' Rice University pedagogical video series about AI, targeted to high school students. 2026.

PAST RESEARCH PROJECTS

Words without a core? The dynamic organisation of words in the brain (July 2017–December 2018)
Principal investigator: Jeremy Skipper. *Project collaborators:* Lotte Meteyard, Elliot Murphy. *Project type:* Experimental (MEG). *Project base:* Department of Experimental Psychology, UCL.

Situation models and the dynamics of linguistic computation (November 2016–December 2018)
Principal investigator: Elliot Murphy. *Project collaborators:* Neil Burgess, Daniel Bush. *Project type:* Experimental (MEG). *Project base:* Institute of Cognitive Neuroscience, UCL.

The potential role of prediction inhibition in grammatically accurate sentence comprehension (January–August 2015)
Principal investigator: Wing-Yee Chow. *Project collaborators:* Elliot Murphy, Mayumi Baptist. *Project type:* Experimental (eye tracking, EEG). *Project base:* Department of Linguistics, UCL.

Oscillatory basis of complex polysemy in copredication (December 2017–May 2018).
Principal investigator: Elliot Murphy. *Project collaborators:* Wing-Yee Chow. *Project type:* Experimental (EEG). *Project base:* Department of Linguistics, UCL.

OTHER ACADEMIC SERVICES

Organizer of UCL's Syntax Reading Group (academic year 2016-17) with Patrick Elliott and Caterina Paolazzi.

Organizer of UCL's Syntax Reading Group (academic year 2017-18) with Gregor Williamson and Michael Mourounas.

Textual transcription: *The Responsibility of Intellectuals: Reflections by Noam Chomsky and Others after 50 Years*. Edited by Nicholas Allott, Chris Knight, and Neil Smith, and commentaries by Noam Chomsky. London: UCL Press. 2019.

Judge for the 2023 Medical School Retreat graduate school poster competition, McGovern Medical School, UTHealth. 7 March

RESEARCH REPORTED IN THE MEDIA

Associating variations in brain waves with linguistic difficulties in autism spectrum disorder. *JANO: Medicina y Humanidades*, Elsevier, 25 May 2016.

Texas man plays piano while undergoing brain tumor surgery. Fox News 26 report, 18 August 2021.

Texas man plays piano during brain surgery in Houston. KHOU-11 news report, 22 August 2021.

No, artists and designers aren't about to lose their jobs to AI. Max Chafkin, *Bloomberg Businessweek*, 25 October 2022.

Two brain networks are activated while reading, study finds. *Science Daily*, 17 April 2023.

The role of the 'jabberwocky' in the latest research. *Radio New Zealand*, 19 April 2023.

An amazing discovery: This is what reading does to our brains. *Sky News Arabia*, 19 April 2023.

This Is Your Brain on Books: Science Reveals Secrets of Reading. *US News and World Report*, 24 April 2023.

You Are What You Read. *KPRC AM 950*, 25 April 2023.

Different areas of the brain activated depending on structural complexity of music and language, study shows. *Medical Xpress*, 5 July 2023.

Simple and Complex Melodies Activate Different Areas of the Brain. *Technology Networks*, 6 July 2023.

Brain's Melody and Prose: How Music and Language Affect Different Regions. *Neuroscience News*, 8 July 2023.

Harmony and Syntax: The Brain's Score for Music and Language - Neuroscience News. YouTube. 8 July 2023.

The brain's reading riddle: dual brain regions unlock language's depths. *Neuroscience News*. 24 October 2023.

Two regions of the brain critical to integrating semantic information while reading, UTHealth Houston research finds. *Science News Net*. 24 October 2023.

Brain Regions Collaborate to Understand Language, Study Finds. *National Today*. 1 April 2026.

SOLICITED COMMENTARY

Our earliest ancestors weren't as brainy as we thought, fossil skulls suggest. *Science*. 8 April 2021. Mike Price.

Individual neurons tune to complex speech sounds and cues. *The Transmitter*. 15 March 2024.

REVIEWS OF WORK

Unmaking Merlin (2014)

Tom Malleon, author of *After Occupy: Economic Democracy for the 21st Century*: "Murphy is remarkably erudite for such a young scholar ... He zooms with apparent ease and familiarity from George Orwell to Friedrich Nietzsche to James Joyce ... He shows that the central concerns of anarchists have always been self-determination, mutual aid, and an end to structural violence." (review, *Ceasefire Magazine*, 27 March 2015)

Anita Biressi, co-author of *Class and Contemporary British Culture*: "Elliot Murphy is a superb guide and analyst of the repressed and marginalised anarchist tradition in British culture. His fresh readings of both renowned and obscure writers and the historical political undercurrents with which they engaged will intrigue scholars ... A gripping and important book." (book cover endorsement)

Jonathan Bigger, PhD researcher, Loughborough University: "[I]t is epic in terms of the sheer number of authors and works that are referenced – Murphy has provided a book that shows an astonishing and thorough understanding of the subject matter. ... This book is an extremely enjoyable read and an important collection of thoughts and ideas." (review, *Anarchist Studies* 23(2): 113-114, Autumn 2015)

The Oscillatory Nature of Language (2020)

Jordi Martorell, Basque Center on Cognition, Brain and Language: "[T]his book represents a thoughtful attempt to integrate two alternative approaches to syntax – theoretical linguistics and neurolinguistics – within the broader context of evolution and cognitive neuroscience. ... Murphy interestingly considers neural

oscillations at the algorithmic level of analysis, pointing to their relevance in the temporal unfolding (*when*) and order (*how*) of executed operations, which goes substantially beyond the common algorithmic interpretation of psycholinguistic behavioural evidence.” (review, *Journal of Linguistics* 57(2): 453-457, April 2021)

REVIEWER SERVICES

Journals: *Adaptive Behavior*; *Annals of the New York Academy of Sciences*; *Bioengineering*; *Biolinguistics*; *Biological Theory*; *Brain & Language*; *Cognitive Processing*; *Cognitive Science*; *Cortex*; *Current Opinion in Behavioral Sciences*; *Developmental Science*; *Discover Artificial Intelligence*; *Discover Mental Health*; *eNeuro*; *Epilepsia*; *European Journal for Philosophy of Science*; *Frontiers in Psychiatry*; *Games and Culture*; *Imaging Neuroscience*; *iScience*; *Journal of Cognitive Science*; *Journal of Language Evolution*; *Journal of Neuroscience*; *Linguistics and Philosophy*; *Language, Cognition and Neuroscience*; *Language Sciences*; *Military Medical Research*; *Mind & Language*; *MIT Press (monograph review)*; *Nature Human Behaviour*; *Nature Neuroscience*; *Neural Processing Letters*; *Neurobiology of Language*; *Neuroscience*; *Neuroscience and Biobehavioral Reviews*; *PCI Registered Reports*; *PLOS ONE*; *Psychiatry Research*; *Progress in Neuro-Psychopharmacology & Biological Psychiatry*; *Scientific Reports*

Books: *The Talking Species: Perspectives on the Evolutionary, Neuronal and Cultural Foundations of Language* (volume edited by Eva Maria Luef and Manuela Marin)

Grants: Leverhulme Trust grant application (April 2018)
National Science Foundation (*Perception, Action and Cognition*) (March 2023, March 2025, April 2025) – Three grant proposals
National Science Foundation (*Linguistics*) (August 2025) – One grant proposal
Swiss National Science Foundation (July 2024, June 2025) – Two separate grant proposals

SKILLS

Programming/research platforms: MATLAB (Cogent, EEGlab, Psychtoolbox)

Statistical/data software: SPM, AFNI, R, SPSS

TRAINING

Advanced Core Training in Linguistics (ACTL). Department of Linguistics, UCL, 23–27 June 2014.

Designing and Analyzing fMRI Experiments, UCL, Spring 2014.

ACTL. Department of Linguistics, UCL, 22–26 June 2015.

Origins of Human Language: Birds, Monkeys, and Humans. EdCast course, June 2015.

Matlab for Cognitive Neuroscience. Institute of Cognitive Neuroscience, UCL, Autumn 2015.

R Statistics Workshop (Advanced). Department of Linguistics, UCL, 18–20 May 2016.

SPM for M/EEG+fMRI. Wellcome Trust Centre for Neuroimaging, UCL, May 2017.

AFNI Bootcamp, NIH Campus, Bethesda, Maryland, 4–8 November 2019.

Introduction to Computational Neuroscience, Rice University, Department of Engineering, January–April 2020.

UCL Neuropixels Course. 17–18 October 2023.

MEMBERSHIPS

- Society for Neuroscience
- Society for the Neurobiology of Language
- International Association of Syntactic Cartography

VOLUNTEERING

- Doctors Without Borders/ Médecins Sans Frontières (MSF) Student Society Representative, University College London Union. November 2015 – December 2018
- Bishop Creighton House, Mentor for adult male with learning disabilities. February – December 2018

REFERENCES

Antonio Benítez-Burraco, Professor, Department of Spanish, Linguistics, and Theory of Literature, University of Seville. *email:* abenitez8@us.es

Karl Friston, Professor, University College London. *email:* k.friston@ucl.ac.uk

Gary Marcus, Emeritus Professor, New York University. *email:* gary.marcus@icloud.com

Evelina Leivada, Professor, Universitat Autònoma de Barcelona. *email:* evelina.leivada@uab.cat

Jill de Villiers, Professor, Smith College. *email:* jdevilli@smith.edu