Saskia Frisby
MRC Cognition and Brain Sciences Unit, University of Cambridge, Cambridge, UK CB2 7EF
she/her · saskia.frisby@mrc-cbu.cam.ac.uk · +44 7443 435888

Employment

2024–2027 Postdoctoral Research Associate (MRC Cognition & Brain Sciences Unit)
Projects will focus on detailed characterisation of semantic representations using magnetoencephalography (MEG), electrocorticography (ECoG), computational modelling, and multivariate decoding.

Education

2020–2024 PhD in Medical Sciences (MRC Cognition and Brain Sciences Unit)
Title: "A comparison of imaging modalities and decoding methods for detecting semantic information in the brain".

- Produced theoretical review that unifies contradictory theories of semantic cognition and provides a field-guide to decoding of neuroimaging data.
- Characterised the role of frequency bands in semantic representation via multivariate time-frequency analysis of electrocorticography (ECoG) data.
- Optimised novel 7T-fMRI protocol that will enable imaging of the anterior temporal lobe in both healthy participants and patients.
- Demonstrated that state-of-the-art decoding methods (including Representational Similarity Learning) can be applied to 7T-fMRI data to reveal graded semantic representation in the brain.

2017–2020 BA (Hons) Psychological and Behavioural Sciences, Gonville & Caius College, University of Cambridge
First class in all three years.

Visiting positions

June–July 2023 University of Wisconsin-Madison: Visiting PhD Student in the Knowledge and Concepts Lab led by Professor Tim Rogers.

- Contributed to the development of WISC MVPA (a toolbox for decoding with novel methods including Representational Similarity Learning and Sparse-Overlapping-Sets LASSO) into a publicly available resource.

Funding

2020–2024 Stanley Elmore Studentship in the Biomedical Sciences, Gonville & Caius College, Cambridge (£6000 p.a.; stipendiary "top-up" award for academic excellence)
2020–2024 Medical Research Council Studentship (stipend plus all university fees)
2023 Gonville & Caius Travel and Research Expenses Grant (£850)
2022 Experimental Psychology Society Study Visit Grant (£3500)
2019 Summer Vacation Project Grant from G. C. Grindley Fund (£1200)
2019 Gonville & Caius Summer Internship Grant (£400)

Academic awards

2024	ARRC Research Culture Celebration Nominee (University-level recognition for positive contribution to research culture)
2022	Prize for best poster, Cambridge Imaging Festival
2020	Departmental Commendation, Department of Psychology, University of Cambridge (awarded to 5 best-performing students in third-year Psychology exams)
2019	Senior Scholarship, Gonville & Caius College, Cambridge (for first in second-year exams)
2018	Scholarship, Gonville & Caius College, Cambridge (for first in first-year exams)

Publications

Frisby, S. L., Halai, A. D., Cox, C. R., Lambon Ralph, M. A., & Rogers, T. T. (2023). Decoding semantic representations in mind and brain. *Trends in Cognitive Sciences, 27* (3), pp. 27-53.

Preprints

Frisby, S. L., Correia, M. M., Zhang, M., Rodgers, C. T., Rogers, T. T., Lambon Ralph, M. A., & Halai, A. D. (2025). Optimising 7T-fMRI for imaging regions of magnetic susceptibility. bioRxiv. https://doi.org/10.1101/2025.03.17.643748

Frisby, S. L., Halai, A. D., Cox, C. R., Clarke, A., Shimotake, A., Kikuchi, T., Kuneida, T., Arakawa, Y., Takahashi, R., Matsumoto, R., Ikeda, A., Rogers, T. T., & Lambon Ralph, M. A. (2025). All spectral frequencies of neural activity reveal semantic representation in the human anterior ventral temporal cortex. bioRxiv. https://doi.org/10.1101/2025.04.17.649404

Papers in preparation

Frisby, S. L., Cox, C. R., Halai, A. D., Lambon Ralph, M. A., & Rogers, T. T. (in prep.) Decoding semantics with 7T-fMRI: Convergent evidence and divergent discovery.

Cox, C. R., Frisby, S. L., Mukherjee, K., Colón, I., Nowak, R. D., & Rogers, T. T. (in prep.) WISC MVPA: Wholebrain imaging with sparse correlations.

Invited talks

April 2025	"Decoding semantics with 7T-fMRI: Convergent evidence and divergent discovery" – Bangor University.
May 2025	"Decoding semantic representations in mind and brain" – Georgia Tech, USA (via Zoom).
May 2025	"All spectral frequencies of neural activity reveal semantic representation in the human anterior ventral temporal cortex" – Waseda University, Japan.
Jan 2025	"Research culture: one early career researcher's perspective" (panel discussion), Cambridge University Annual Meeting for Directors of Postgraduate Education.
Nov 2023	"Research culture: one early career researcher's perspective" (talk and panel discussion), Cambridge University Science and Policy Exchange.

July 2023 "A comparison of imaging modalities and decoding methodologies for detecting semantic information" – Department of Psychology, Louisiana State University, USA (via Zoom).

Talks

Nov 2023 "Representational Similarity Learning" - MRC Cognition and Brain Sciences Unit Methods Day.

Nov 2023 "ECoG in Japan and Cambridge: Past and current results" – Kobe University, Japan.

June 2023 "Decoding semantic representations in mind and brain" – AI + Society Seminar, University of Wisconsin-Madison.

Dec 2022 "Intracranial adventures: Using electrocorticography (ECoG) to characterise semantic processes" – MRC Cognition and Brain Sciences Unit Methods Day.

May 2022 "Decoding contemporary approaches to semantic representations in cortex" – MRC Cognition and Brain Sciences Unit Wednesday Lunchtime Seminar.

Nov 2021 "What kind of neural code underpins semantic representations?" – Mental Sciences Club, Department of Philosophy, University of Cambridge.

Conference presentations

October 2024 Annual Meeting of the Society for the Neurobiology of Language – presented poster entitled "Ultra-high-field (7T) fMRI reveals graded semantic structure in the ventral anterior temporal cortex".

October 2023 Annual Meeting of the Society for the Neurobiology of Language – presented poster entitled "Optimising 7T-fMRI for imaging the anterior temporal lobe".

July 2023 Annual Meeting of the Organization for Human Brain Mapping – presented poster entitled "Human grid electrode ECoG reveals a cross-frequency semantic code in anterior temporal cortex".

May 2023 Spring Meeting of the British Neuropsychological Society – presented poster entitled "Human grid electrode ECoG reveals a cross-frequency semantic code in anterior temporal cortex".

October 2022 Annual Meeting of the Society for the Neurobiology of Language – presented poster entitled "Human grid electrode ECoG reveals that local neural activity in anterior temporal cortex expresses semantic information."

June 2022 Cambridge Imaging Festival – presented poster, and gave Slide Slam, entitled "Multi-echo, but not parallel transmit or multiband, improves imaging of semantic cognition with 7T-fMRI".

Technical skills

- Collecting 7T-fMRI data: recruiting participants, collaborating with MRI physicists to select appropriate acquisition parameters, and working with radiographers to ensure that data are consistently of high quality.
- Manipulating 7T-fMRI and ECoG data: experience using software including SPM12, AFNI, FSL, tedana, ANTS, fmriprep and eeglab implemented in MATLAB, Bash, R and Python.
- Decoding 7T-fMRI and ECoG data: theoretical and practical understanding of standard decoding methods, including regression with LASSO regularisation, and novel

approaches, including regression with Sparse-Overlapping-Sets LASSO regularisation and Representational Similarity Learning with group-ordered-weighted LASSO regularisation.
- Optimising computationally demanding workflows: experience using both high-performance and high-throughput computing architectures via slurm and HTCondor.

Collaborations

- Professor Riki Matsumoto – Division of Neurology, Kobe University, Japan
- Dr Akihiro Shimotake – Department of Neurology, Kyoto University, Japan
- Dr Christopher Cox – Department of Psychology, Louisiana State University, USA
- Dr Alex Clarke – Department of Psychology, University of Warwick
- Liz Simmonds – Head of Research Culture, University of Cambridge

Teaching

2022-2024 Supervisor for PBS2: Psychological Enquiry and Methods (16 weeks), part of 1st year Psychological and Behavioural Sciences, Robinson College (2022-2024) and St John's College (2023-2024), University of Cambridge.

- Designed and delivered personalised seminars to groups of 1-4 students.
- Set and marked essays, providing supportive and constructive written feedback.
- Managed challenging student behaviour in a thoughtful and sensitive manner.

Nov 2021-present Lecturer in Research Culture, part of the Robust Behavioural Science Course offered to MPhil and first-year PhD students, MRC Cognition and Brain Sciences Unit and Departments of Psychology and Psychiatry, University of Cambridge.

- Designed an interactive seminar for ~30 students to promote their understanding of University and departmental research culture strategy.
- Facilitated discussion, encouraging students to consider their own role in improving research culture.
- Advocated successfully for the inclusion of research culture teaching in the MRC Cognition and Brain Science's Unit's new MPhil programme.
- Supported staff in the Departments of Physiology, Development, and Neuroscience, and Public Health and Primary Care, in designing research culture teaching for their students.

Outreach

Aug 2022 "Imaging the anterior temporal lobe with fMRI" – presentation to 20 prospective Psychology applicants from disadvantaged backgrounds as part of the Sutton Trust Summer School.

May 2022 "All about the brain" – interactive workshop, delivered via Zoom, for drama group members aged 11-13 at the Storyhouse Theatre, Chester.

March 2022 "What kind of neural code underpins semantic representations?" - pre-recorded talk for general public interest at the Cambridge Festival.

Leadership

2021–present MRC Cognition and Brain Sciences Unit Working Group on Research Culture (group lead)

- Established group to address areas for departmental culture improvement.
- Led an interactive workshop to improve awareness of University research culture policy and to empower scientists to shape departmental policy.
- Oversaw detailed survey of lab group culture to assess individuals' concerns and identify areas for improvement.
- Coordinated efforts with existing departmental committees (Open Science; Equality, Diversity and Inclusion) and with University research culture initiatives.

2020–present MRC Cognition and Brain Sciences Unit Open Science Committee (member)

- Influenced decision-making about departmental open science policy surrounding teaching, hiring, publishing, and relationships with other open science groups in the University, the UK and beyond.

Ad-hoc reviewing

- Brain and Language
- Language, Cognition & Neuroscience

Professional memberships

- Experimental Psychology Society – Postgraduate Member
- Society for the Neurobiology of Language – Student Member
- Organization for Human Brain Mapping – Student Member
- British Neuropsychological Society – Associate Member

Relevant extracurricular experience

2021–present <u>Dancing teacher, Cambridge University Strathspey & Reel Club and The Cambridge Dancers</u>

Qualifications: Full Teaching Certificate (Royal Scottish Country Dance Society)

- Delivered clear and engaging classes to groups of ~20 dancers who range in ability from beginners to international competitors.
- Managed the interpersonal dynamics of dancers of different skill levels and with differing personalities.
- Provided individualised feedback to every dancer (despite the large class size), enabling them to realise their potential.

2023–24 <u>Spring Fling Committee Chair and Designated Safeguarding Lead</u>

Qualifications obtained: Designated Safeguarding Lead (Level 3 Safeguarding Children)

- Organised residential Scottish country dancing weekend for 100 attendees from multiple countries and received overwhelmingly positive reviews.
- Mentored and united a committee of volunteers. Supported each member to develop their organisational skills and to achieve goals on time.

- Communicated effectively, including with senior members of national governing organisations and charities.
- Developed a Code of Conduct, including policies to safeguard young people and to promote a culture of diversity and inclusion.

Referees

Professor Matt Lambon Ralph (PhD supervisor) – matt.lambon-ralph@mrc-cbu.cam.ac.uk
Professor Tim Rogers (PhD supervisor) – ttrogers@wisc.edu