

## Saskia Frisby

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### Employment

2024– Postdoctoral Research Associate (MRC Cognition & Brain Sciences Unit)  
2027 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– University of Wisconsin–Madison: Visiting PhD Student in the Knowledge and  
July 2023 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

May 2025	“All spectral frequencies of neural activity reveal semantic representation in the human anterior ventral temporal cortex” – Waseda University, Japan.
May 2025	“Decoding semantic representations in mind and brain” – Georgia Tech, USA.
April 2025	“Decoding semantics with 7T-fMRI: Convergent evidence and divergent discovery” – Bangor University.
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, fmripred 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 – Department of Neurology, Kyoto 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 1<sup>st</sup> 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 Dancing teacher, Cambridge University Strathspey & Reel Club and The Cambridge Dancers

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 Spring Fling Committee Chair and Designated Safeguarding Lead

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 (current line manager, PhD supervisor) – matt.lambon-ralph@mrc-cbu.cam.ac.uk
- Professor Tim Rogers (PhD supervisor) – ttrogers@wisc.edu