EPS

Experimental Psychology Society

LANCASTER MEETING

2-4 April 2025

Open exchange of new ideas is central to EPS meetings. To foster up-to-date discussion, presenters are mandated to report work that is not yet published. We ask that attendees respect this mandate. Please do not record or publish presented material (e.g., via X or Facebook) without the presenter's permission. To remove any ambiguity regarding permission, this programme now includes a symbol next to every abstract (the hashtag shown on this page), where the presenter has agreed permission for their work to be shared on social media. Where no symbol is shown for a given presentation, there should be absolutely no filming, pictures, or social media of any kind. For explicit guidance on reporting at EPS meetings, please refer to the EPS handbook.

A scientific meeting will be held at Lancaster University, Furness College, Lancaster, LA1 4YW, between 2nd – 4th April 2025.

There will be a welcome desk in the Furness Foyer. Talks are in the Biology Lecture Theatre and Furness Lecture Theatre 2. The poster sessions and accompanying receptions are in the LEC Atrium, and catering during breaks will be in the breakout space in Furness Foyer.

The local organisers are Padraic Monaghan and Alice Milne.

Joint 23rd EPS Mid-Career Prize Lecture
Wednesday 2nd April, 5.15pm

Title TBC.
Jennifer Rodd, University College London

Joint 23rd EPS Mid-Career Prize Lecture Symposium
Wednesday 2nd April, 1.30pm – 5.00pm
Organised by Jo Taylor.

Symposium in Memory of Andrew Johnson
Thursday 3rd April, 2.00pm – 5.30pm
Organised by Mike Page.

14th Frith Prize Lecture
Thursday 3rd April, 5.45pm

Title TBC.
Connor Keating, University of Oxford

Poster Sessions

There will be two poster sessions, one to be held on Wednesday 2nd April between 6.15pm and 7.15pm in the LEC Atrium with an accompanying wine reception. Poster session two will be held on Thursday 3rd April between 1.00pm and 2.00pm in the LEC Atrium with an accompanying lunch reception.

Conference Dinner

The conference dinner will be at The Lancaster Golf Club, Ashton Hall, Lancaster LA2 0AJ on Thursday 3rd April, starting at 7.30pm. The Society has arranged a bus to take attendees from campus to the conference dinner, as well as dropping attendees in Lancaster or on campus after the dinner.

For more details on how to book a place at the conference dinner, please see page 102.

START OF PARALLEL SESSIONS

Session A **– Biology Lecture Theatre**

12:00 **Marie-Josee Bisson** (De Montfort University) Learning to spell in another language.

12:15 **Layla Unger*, Emma James and Gareth Gaskell** (Sponsor: Emma James) (University of York) Learning words from the company they keep.

12:30 **Meyrem Tompson*, Sarah White and Ascension Pagan** (Sponsor: Ascension Pagan) (University of Leicester) The impact of repeated, contextually diverse and semantically diverse text on incidental word learning via reading.

12:45 **Alice Chan*, Fun Lau*, Xin Ru Toh*, Jia Hoong Ong, Gigi Luk* and Francis Wong** (Sponsor: Matthew Mak) (Nanyang Technological University, Singapore, Nottingham Trent University, McGill University, Canada, University of Warwick) Implicit learning and its relationship with reading development: The mediating role of morpheme discrimination in first graders.

13:00 **Tea / Coffee**

START OF PARALLEL SESSIONS

Session B **– Furness Lecture Theatre 2**

12:00 **Samantha Tyler* and Doug Barrett** (Sponsor: Ascension Pagan) (University of Leicester, University of Birmingham) Impact of PTSD on control of eye movements and saccadic inhibition during pro- and anti-saccades.

12:15 **Ziyun Zhang, Cian Xu, Carolyn McGettigan and Antonia Hamilton** (Sponsor: Carolyn McGettigan) (University College London) Mutual prediction under virtual communication: an fNIRS hyperscanning study.

12:30 **Lauren Marsh and Danielle Ropar** (University of Nottingham) Examining rapport between autistic and non-autistic people during online interactions.

12:45 **Rachael Taylor*, Lisa Huerta, Mike Burton and Markus Bindemann** (Sponsor: Markus Bindemann) (University of Kent, University of York) Visual spatial orienting to the gaze of avatars.

13:00 **Tea / Coffee**

START OF PARALLEL SESSIONS

Session A **- Biology Lecture Theatre**

Joint 23rd EPS Mid-Career Prize Symposium

Recent perspectives on the mental lexicon.
Organised by Jo Taylor.

13:30 **Blair Armstrong and Jiangtian Li** (University of Toronto) Neural network model insights into lexical ambiguity.

14:00 **Rebecca Norman** (University College London) The effect of contextual diversity on lexical processing.

14:30 **Matt Davis and Ediz Sohoglu** (University of Cambridge, University of Sussex) Prediction error computations support spoken word recognition.

15:00 **Tea / Coffee**

15:30 **Kathy Rastle** (Royal Holloway University of London) How does prediction shape skilled reading? Insights from large language models.

16:00 **Matthew Mak** (University of Warwick) The contribution of episodic memory and subsequent sleep-related consolidation to the updating of lexical knowledge.

16:30 **Beth Jefferies** (University of York) A gradient perspective on the neural basis of semantic cognition.

17:00 **Break**

17:15 **Joint 23rd EPS Mid-Career Prize - Biology Lecture Theatre**
Jennifer Rodd, University College London
Title TBC.

18:15 **Poster Session One with accompanying wine reception.**

START OF PARALLEL SESSIONS

Session B **- Furness Lecture Theatre 2**

13:30 **Trevor Crawford and Ellie Smith** (Lancaster University) The brain inhibits salient, but not non-salient, distractors in the control of eye-tracking.

14:00 **Katie Allen*, John Towse, Brian Francis and Amy Atkinson** (Sponsor: Amy Atkinson) (Lancaster University) The role of working memory in real world outcomes: Evidence from the ALSPAC cohort.

14:30 **Luísa Superbia-Guimarães*, Dominic Guitard and Nelson Cowan** (Sponsor: Dominic Guitard) (University of Leeds, Cardiff University, University of Missouri, United States of America) Testing item, chunk, and similarity-based constraints on working memory with the multiple-set paradigm.

15:00 **Tea / Coffee**

15:30 **Niklas Ihssen* and Lucy Edgar** (Sponsor: Anthony McGregor) (Durham University) Reward Spill-Over: The impact of rewarding events on the momentary likelihood to consume a subsequent reward.

16:00 **Sandra Lagator*, Tom Beesley, Clara Muniz-Diez and Mark Haselgrove** (Sponsor: Mark Haselgrove) (University of Nottingham, Lancaster University) Variations in the processing of the structure of predictive, non-predictive and uncertain cues. Association or Unitization?

16:30 **Alice Milne* and Maria Chait*** (Sponsor: Tom Beesley) (Lancaster University, University College London) Influence of predictability on sensory processing and cognitive resource allocation.

17:00 **Break**

17:15 **Joint 23rd EPS Mid-Career Prize - Biology Lecture Theatre**
Jennifer Rodd, University College London
Title TBC.

18:15 **Poster Session One with accompanying wine reception.**

Session A **- Biology Lecture Theatre**

09:30 **Kirill Elin*, Federico Gallo*, Vincent DeLuca, Anders Gabrielsen, Toms Voits* and Jason Rothman** (Sponsor: Padraic Monaghan) (Arctic University of Norway, Norway, Lancaster University, University of Gothenburg, Sweden, University Nebrija, Spain) Flanker task performance and neural efficiency in multilingual aging.

09:45 **Srimoyee Chaterjie*, Stephen Monsell and Aureliu Lavric** (Sponsor: Aureliu Lavric) (University of Exeter) How robust is the n-2 language repetition cost, allegedly a demonstration of language inhibition?

10:00 **Toms Voits*, Federico Gallo*, Jason Rothman, Jubin Abutalebi, Yury Shtyrov and Andriy Myachykov** (Sponsor: Andriy Myachykov) (University of Gothenburg, Sweden, UiT the Arctic University of Norway, Norway, Higher School of Economics, Russian Federation, Lancaster University, Nebrija University, Spain, University Vita Salute San Raffaele, Italy, Aarhus University, Denmark, University of Macau, China) Experience-dependent neuroplasticity in the hippocampus of bilingual young adults.

10:15 **Federico Gallo*, Vincent DeLuca, Jason Rothman, Jubin Abutalebi, Yury Shtyrov and Andriy Myachykov** (Sponsor: Andriy Myachykov) (UiT-The Arctic University of Norway, Norway, Higher School of Economics, Russian Federation, Lancaster University, University Nebrija, Spain, Vita-Salute San Raffaele University, Italy, Aarhus University, Denmark, University of Macau, China) Neurocognitive modulations of the cerebellum of bilingual young adults.

10:30 **Tea / Coffee**

11:00 **Hillarie Man*, Adam Parker, Jo Taylor and Bonnie Chow*** (Sponsor: Adam Parker) (University College London) Processing benefits during code-switched reading in Cantonese-English bilinguals: Evidence from eye movements.

11:15 **Hailong Chen*, Padraic Monaghan and Katherine Messenger** (Sponsor: Padraic Monaghan) (Lancaster University) The production of non-canonical word orders in spoken Mandarin Chinese: Comparing syntactic priming in first, second and heritage language speakers.

11:30 **Esra Ataman*, Elisabeth Beyersmann, Anne Castles and Signy Wegener** (Sponsor: Kate Nation) (Macquarie University, Australia, Australian Catholic University, Australia) Oral vocabulary and learning to read morphologically complex words: Evidence from eye-tracking.

11:45 **Jiaxuan Chen* and Bo Yao** (Sponsor: Bo Yao) (Lancaster University) Linguistic and cognitive dimensions of topic- and subject-prominence in Chinese and English.

12:00 **EPS Business Meeting for Ordinary and Postgraduate Members**
Biology Lecture Theatre

13:00 **Poster Session Two with accompanying lunch reception.**

Session B **- Furness Lecture Theatre 2**

09:30 **Bowen Xiao* and Rebecca Lawson** (Sponsor: Rebecca Lawson) (University of Cambridge) Arousal-linked Bayesian Attention Dynamics during learning.

09:45 **Julia Vogt*, Yasmene Bajandouh and Louisa Butler** (Sponsor: Katie Gray) (University of Reading) Seeing Conflict: Identifying goal conflict attenuates allocation of visual attention to positive stimuli.

10:00 **Jessica Pepper*, Jason Braithwaite, Theodoros Bampouras* and Helen Nuttall** (Sponsor: Helen Nuttall) (Lancaster University, Liverpool John Moores University) Age-related changes in alpha activity during dual-task speech perception and balance.

10:15 **Lucy MacGregor, Fritz Peters* and Matthew Davis** (University of Cambridge, University of Sheffield) Measuring and explaining individual variability in speech comprehension.

10:30 **Tea / Coffee**

11:00 **Louise Nicholls, Julia-Marie Lukas, Linzi Crawford and Lazaro Jackson** (University of Strathclyde) Use of everyday memory strategies predicts subjective cognitive difficulties across the adult lifespan.

11:15 **Emma James and Layla Unger*** (University of York) Online and offline mechanisms of memory integration over development.

11:30 **Amy Atkinson and Jennifer Thompson** (Lancaster University) How does existing knowledge affect working memory performance in children?

11:45 **Lewis Ball*, Eva Kimel, Vanessa Keller, Eloise Ward, Scott Cairney, Matthew Mak, Jennifer Rodd and Gareth Gaskell** (Sponsor: Matthew Mak) (University of York, University of Warwick, University College London) No evidence for a targeted memory reactivation effect on word-meaning priming.

12:00 **EPS Business Meeting for Ordinary and Postgraduate Members**
Biology Lecture Theatre

13:00 **Poster Session Two with accompanying lunch reception.**

Session A **- Biology Lecture Theatre**

Symposium in Memory of Andrew Johnson

This charming man: Honouring the life and work of Dr Andy Johnson.
Organised by Mike Page.

14:00 **Andrew Paice, Rebecca Legg, Andy Johnson, Eleonore Smalle and Mike Page** (University of Hertfordshire, University of Bournemouth, Tilburg University, The Netherlands) Exploring the role of 'item overlap' in the Hebb Repetition Effect.

14:30 **Rebecca Legg, Andrew Paice, Mike Page and Andy Johnson** (University of Bournemouth, University of Hertfordshire) Is there Hebb repetition learning for semantic information?

15:00 **John Marsh and Mark Hurlstone** (University of Central Lancashire, Luleå University of Technology, Sweden, Lancaster University) Modality Matters: Rethinking the changing-state effect in serial recall.

15:30 **Tea / Coffee**

16:00 **Daisy Roe, Richard Allen, Christopher Miles, Andy Johnson and Jane Elsley** (University of Bournemouth, University of Leeds) Serial order effects in tactile serial recall: Exploring the contributing roles of executive resources and perceptual attention in the tactile prioritisation effect.

16:30 **Geoff Ward and C. Philip Beaman** (University of Essex, University of Reading) The importance of start-sequences and end-sequences in understanding serial position effects in immediate memory tasks.

17:00 **Richard Allen, Hatice Cinar, Asiyah Alzahrani, Amy Atkinson and Amanda Waterman** (University of Leeds, Lancaster University) Prioritising different forms of binding in working memory: Building on Johnson & Allen (2023).

17:30 **Break**

17:45 **14th Frith Prize Lecture - Biology Lecture Theatre**
Connor Keating, University of Oxford
Title TBC.

Conference Dinner

Session B **- Furness Lecture Theatre 2**

14:00 **Simon Liversedge, Manman Zhang, Zhichao Zhang, Fang Li, Xuejun Bai and Chuanli Zang** (University of Central Lancashire, Tianjin Normal University, China, Liverpool Hope University) Foveal load reduces efficacy of parafoveal processing during Chinese reading.

14:30 **Margriet Groen, Mark van den Bunt and Ludo Verhoeven** (Lancaster University, Haskins Laboratories, United States of America, Radboud University Nijmegen, The Netherlands) Deficient sensorimotor adaptation in dyslexia.

15:00 **Joanne Taylor, Adam Jowett, Tibor Auer, Angelika Lingnau and Kathy Rastle** (University College London, Royal Holloway, University of London, University of Regensburg) The nature of a writing system shapes the cognitive and neural mechanisms for reading acquisition.

15:30 **Tea / Coffee**

16:00 **Dave Kenneth Tayao Cayado*, Samantha Wray, Adam Chong and Linnaea Stockall** (Sponsor: Kathy Rastle) (Royal Holloway, University of London, Dartmouth College, United States of America, Queen Mary, University of London) Early morphological decomposition is robust to less visible, inconsistent, and obscured morphemes.

16:30 **Holly Cooper*, Maria Korochkina, Marc Brysbaert and Kathy Rastle** (Sponsor: Kathy Rastle) (Royal Holloway, University of London, University of Ghent, Belgium) What and how do we learn about morphemes through reading experience?

17:00 **Anna Gowenlock*, Jennifer Rodd, Beth Malory and Courtenay Norbury** (Sponsor: Jennifer Rodd) (University College London) A comparison of lexical features in children's video media and child-directed speech.

17:30 **Break**

17:45 **14th Frith Prize Lecture - Biology Lecture Theatre**
Connor Keating, University of Oxford
Title TBC.

Conference Dinner

START OF PARALLEL SESSIONS

Session A **- Biology Lecture Theatre**

09:30 **Guyu Shen*, Amy Atkinson and Bo Yao** (Sponsor: Bo Yao) (Lancaster University) Semantic versus episodic memory systems in concrete and abstract conceptual processing.

09:45 **Mingtong Li*, Suzanne Aussems and Sotaro Kita** (Sponsor: Matthew Mak) (University of Warwick) The role of iconic gesture speed in verb-action matching with 2-year-olds, 3-year-olds and adults.

10:00 **Xiao Ke*** (Sponsor: Margriet Groen) (Lancaster University) Does the conceptual structure of causal events influence the structure selection in Chinese sentence production? Evidence from a syntactic priming study.

10:15 **Yumeng Lyu*, Kate Stone and Shane Lindsay** (Sponsor: Shane Lindsay) (University of Hull) Beyond Correct Responses: Test-Retest reliability of additional verbal fluency measures.

10:30 **Tea / Coffee**

11:00 **João Vieira*, Elisângela Teixeira and Denis Drieghe** (Sponsor: Denis Drieghe) (University of Southampton, Federal University of Ceará, Brazil) The processing of the definite article in Brazilian Portuguese: When 'the' carries gender and number marking.

11:30 **Holly Jenkins*, Elizabeth Wonnacott and Michael Ramscar** (Sponsor: Elizabeth Wonnacott) (University of Oxford, University of Tübingen, Germany) Error-based learning of grammatical gender systems using semantic cues.

12:00 **Jiuzhou Hao*, Eleonora Rossi, Megan Nakamura, Alicia Luque and Jason Rothman** (Sponsor: Padraic Monaghan) (UiT The Arctic University of Norway, University of Florida, United States of America, Pennsylvania State University, United States of America, Nebrija University, Spain, Lancaster University) Individual differences and morphological markedness in the processing of heritage language Spanish gender agreement: An event-related potential investigation.

12:30 **End of Meeting**

START OF PARALLEL SESSIONS

Session B **- Furness Lecture Theatre 2**

09:30 **Tom Beesley and Matthew Ivory** (Lancaster University) Eyetools: A set of tools for eye data processing, analysis and visualisation in R.

09:45 **Aliya Edwards*, Alex Easton, Kelly Jakubowski and Andrea Halpern** (Sponsor: Alex Easton) (Durham University, Bucknell University, USA) A new method for assessing concurrent pitch and rhythm imagery.

10:00 **Kexuan (Katrina) Qian*, Paul Burgess and Ilayda Demirdag*** (Sponsor: Paul Burgess) (University College London) Can we identify people who are superorganisers based on their proficiency in various skill areas?

10:15 **Chiara Gambi, Ed Donnellan and Matthias Gruber** (University of Warwick, Cardiff University) Trivia-induced curiosity and incidental word learning.

10:30 **Tea / Coffee**

11:00 **Antje Meyer** (Max Planck Institute for Psycholinguistics, The Netherlands) The illusive lemma.

11:30 **Richard Binney*, Veronica Diveica, Faris Mahmood, Emiko Muraki, Andrea Protzner Muraki and Penny Pexman** (Sponsor: Jeremy Tree) (Bangor University, McGill University, Canada, University of Calgary, Canada, Western University, Canada) Social experience makes unique contributions to conceptual knowledge.

12:00 **Yicheng Qiu*, Catie Hopkins, Lewis Ball, Gareth Gaskell and Heather Ferguson** (Sponsor: Heather Ferguson) (University of Kent, University of York) The effect of sleep on consolidating social memories and common ground.

12:30 **End of Meeting**

The first poster session will be held on Wednesday 2nd April between 6.15pm and 7.15pm in the LEC Atrium with an accompanying wine reception.

1. **Simon Hanzal*, Gemma Learmonth, Gregor Thut and Monika Harvey** (Sponsor: Monika Harvey) (University of Glasgow, University of Stirling) Exploring performance during sustained attention.

2. **Sutong Duan*, Chiara Gambi and Matthew Mak** (Sponsor: Matthew Mak) (University of Warwick) Research Plan - How does prediction error influence learning of new word meanings?

3. **Teruni Ahamat*, Sotaro Kita and Suzanne Aussems** (Sponsor: Matthew Mak) (University of Warwick) The effect of different pointing gestures on infants' visual attention and word learning during shared picture-book reading.

4. **Nicole Sin Hang Law*, Elizabeth Wonnacott and Kate Nation** (Sponsor: Kate Nation) (University of Oxford) Statistical learning of graphotactic patterns in non-adjacent dependencies: The role of semantic cues in learning article-noun agreement.

5. **Pegah Imannezhad* and Emmanuel Pothos** (Sponsor: Emmanuel Pothos) (City St. George's, University of London) Probabilistic structures in implicit and explicit learning: An artificial grammar learning approach.

6. **Haydn Farrelly* and Jason Braithwaite** (Sponsor: Jason Braithwaite) (Lancaster University) A novel multisensory method for examining hallucinations and perceptual aberrations in the laboratory.

7. **Georgina Edwards-Lowe*, Elisa La Chiusa, Helen Olawole-Scott and Daniel Yon** (Sponsor: Daniel Yon) (Birkbeck, University of London, Goldsmiths, University of London) Information seeking without metacognition.

8. **Dorothy Gao, Amrita Bains, Anna Gowenlock, Lena Blott, Adam Parker, Kate Nation and Jennifer Rodd** (University College London, University of Oxford, University of Mannheim, Germany) Measuring word meaning knowledge in primary aged children.

9. **Weilin Liu* and Kevin Paterson** (Sponsor: Kevin Paterson) (University of Leicester) The use of context in resolving syntactic ambiguities in Chinese reading.

10. **Ioana Andrada Mihalache*, Beth Helen Richardson, Georgia Chronaki and Philipp Ruhnau** (Sponsor: John Marsh) (University of Central Lancashire) Exploring electrophysiological markers of fatigue via EEG using two fatiguing tasks: AX-CPT vs. TLoadDBack.

11. **Melissa Gibbs*, Aminette D'Souza, Charalampos Sotirakis, Trevor Crawford and Chrystalina Antoniades** (Sponsor: Trevor Crawford) (University of Oxford, Lancaster University) Longitudinal associations between cognitive function and specific motor domains in Parkinson's disease.

12. **Saniye Betul Teksin*, Kirsty Dunn and Calum Hartley** (Sponsor: Amy Atkinson) (Lancaster University) Investigating prenatal speech processing in foetuses with and without increased likelihood of developing autism: A preliminary analysis.

13. **Padraic Monaghan, Nomi Olsthoorn, Emily Mallinson and Kin Chung Jacky Chan** (Lancaster University, Durham University) The effect of language mixing on vocabulary acquisition: A cross-situational statistical word learning study.

14. **Mahmoud Elsherif and Jonathan Catling** (University of Birmingham, University of Leicester) Harmonizing in Tune: Age of acquisition in melodic recognition.

15. **Helen Olawole-Scott*, Sam Gilbert and Daniel Yon** (Sponsor: Daniel Yon) (Birkbeck, University of London, Goldsmiths, University of London, University College London) Expectations about precision in the human brain.

16. **Wanyin Li*, Mahmoud Elsherif and Zlatomira Ilchovska** (Sponsor: Mahmoud Elsherif) (University of Reading, University of Leicester, University of York) The role of cognitive control and bilingual experiences in cross-language activation of idiomatic meanings.

17. **Mark Gardner** (University of Westminster) Implicit mentalising and its relation to autistic traits.

18. **Kyla McConnell*, Florian Hintz and Antje Meyer** (Sponsor: Antje Meyer) (Max Planck Institute for Psycholinguistics, The Netherlands, Radboud University, The Netherlands, Philipps University, Germany) Individual differences in online research: Comparing lab-based and online administration of a psycholinguistic battery of linguistic and domain-general skills.

19. **Jinyu Shi*, Kate Nation and Elizabeth Wonnacott** (Sponsor: Kate Nation) (University of Oxford) The effect of language experience on classifier-noun production in Mandarin Chinese.

20. **Christina Sapachlari*, Claudia Danielmeier, Roland Pfister and Jan Derrfuss** (Sponsor: Gonzalo Urcelay) (University of Nottingham, Trier University, Germany) Exploring error cancellation and stimulus recall for aware and unaware errors.

21. **Rebecca Jackson, Matthew Lambon Ralph and Timothy Rogers** (University of York, University of Cambridge, University of Wisconsin-Madison, United States of America) Late maturation of semantic control promotes conceptual development.

22. **Martin Vasilev, Rachel Lee, Sumaya Musse and Adam Parker** (University College London) Do readers use word length information to guide their eyes to a new line of text?

23. **Mathilde Prenevost*, Ida Nilsen, Evalill Bølstad, Francisco Pons, Paul Harris and Rolf Reber** (Sponsor: Padraic Monaghan) (Lancaster University, Stockholm University, Sweden, University of Oslo, Norway, Harvard University, United States of America) Accuracy, confidence and motivation in children's insight problem-solving.

24. **Jaydan Pratts*, Gorana Pobric and Bo Yao** (Sponsor: Bo Yao) (University of Manchester, Lancaster University) Bridging phenomenology and neural mechanisms of inner speech: ALE meta-analysis on egocentricity and spontaneity in a dual-mechanistic framework.

25. **Ed Donnellan, Matthew Mak and Chiara Gambi** (University of Warwick) Memory effects of linguistic prediction.

The second poster session will be held on Thursday 3rd April between 1.00pm and 2.00pm in the LEC Atrium with an accompanying lunch reception.

1. **Vasiliki Paparodami, Ida Nilsen, Jasmin Richter, Mathilde Prenevost, Rümeysa Nur Unsal, Selen Tezcan, Eva Sandsberg and Rolf Reber** (Sponsor: Padraic Monaghan) (University of Oslo, Norway, Stockholm University, Sweden, Lancaster University) Stimulus visibility influences intuitive judgments and identification in the same way.

2. **Guyu Shen*, Amy Atkinson and Bo Yao** (Sponsor: Bo Yao) (Lancaster University) Global attention style promotes abstract concept generation.

3. **Emerald Grimshaw*, Simon Thurlbeck, Anna Matejko, Robert Kentridge and Dorothy Cowie** (Sponsor: Trevor Crawford) (Durham University) Exploring the features of Immersive Virtual Reality that make it a potentially useful pedagogical tool.

4. **Eliza Niblett*, Florence Merken, Philippine Geelhand de Merxem and Sophie Sowden-Carvalho** (Sponsor: Connor Keating) (University of Birmingham, Universite Libre de Bruxelles, Belgium) Communication mode preferences: The influence of autism diagnosis, camouflaging and anxiety.

5. **Yanxi Lu*, Kate Cain, Bo Yao and Francesca Citron** (Sponsor: Francesca Citron) (Lancaster University) Effects of culture relatedness on bilingual emotional responses to words: Insights from word norms and event-related potentials (ERPs).

6. **Liuqi Zhu, Padraic Monaghan and Patrick Rebuschat** (Sponsor: Padraic Monaghan) (Lancaster University, University of Tübingen, Germany) The effect of perceptual salience (sonority, syllabicity) and markedness of grammatical morphemes in the cross-situational learning of morphology.

7. **Dagmar Fraser*, Max Di Luca and Jennifer Cook** (Sponsor: Connor Keating) (University of Birmingham) Laying down the law: The velocity curvature power law of biological movement.

8. **Ping Chen* and Jennifer Cook** (Sponsor: Connor Keating) (University of Birmingham) Research Plan - A Comprehensive Test Battery for Social Cognition.

9. **Silke Wortha*, Korbinian Moeller and Julia Bahnmueller** (Sponsor: Camilla Gilmore) (Loughborough University) Understanding Negative Fractions: Evidence from Eye-Tracking.

10. **Bo Yao and Harrison Peak** (Lancaster University) Distinct mechanisms underlying dialogic and other-people inner speech.

11. **Gabriella Silva*, Pablo Bernabeu, Christina Athanasiadi, Stella Lucia Pischinger, Ngoc Giang My Hoang, Vincent DeLuca, Claudia Poch, Iva Ivanova, Jason Rothman and Jorge Gonzalez Alonso** (Sponsor: Padraic Monaghan) (Nebrija University, Spain, UiT The Arctic University of Norway, Norway, University of Texas at El Paso, United States of America, Lancaster University) The interplay of cognition and bilingual repertoires in L3 Learning: An EEG approach.

12. **Marta Mangiarulo*, Anna Nowakowska and Caren Frosch** (Sponsor: Ascension Pagan) (University of Leicester) Research Plan - Subjective confidence in probability judgments: A signal detection perspective.

13. **Siqi Zou*, Patrick Rebuschat, Padraic Monaghan and Susana Correia** (Sponsor: Padraic Monaghan) (Lancaster University, University of Lisbon, Portugal) Individual differences in L2 speech segmentation: Evidence from auditory statistical learning.

14. **Hambel Willow*, Gert Westermann and Xiaoyun Chen** (Sponsor: TBC) (Lancaster University) Research Plan - Development of curiosity-based exploration in infancy and toddlerhood.

15. **Jiayi Li*, Simón Ruiz, Yuxin Ge and Patrick Rebuschat** (Sponsor: Padraic Monaghan) (Lancaster University, Public University of Navarra, Spain, University of Tübingen, Germany) Aptitude-treatment interaction in SLA: A methodological synthesis**.**

16. **Kirsty Green*, Marcus Perlman and Sotaro Kita** (Sponsor: Matthew Mak) (University of Warwick, University of Birmingham) Do infants and older children benefit equally from iconicity when learning novel onomatopoeias?

17. **Malcolm Ka Yu Wong*, Calum Hartley, Jessica Wang and Marina Bazhydai** (Sponsor: Padraic Monaghan) (Lancaster University) Is implicit mentalising 'social'? Investigating the domain-specificity and developmental trajectory of implicit mentalising.

18. **Matei Petre*, Beth Richardson, John Marsh and Linden Ball** (Sponsor: Simon Liversedge) (University of Central Lancashire) Utilising eye tracking to investigate cognitive changes induced by time pressure in an email judgement task.

19. **Olesia Platonova*, Sofya Goldina, Céléna Neau, Lena Henke, Ludovica Veggiotti, Rémy Masson, Émilie Faye, Gilles Leloup, Silvia Marchesotti, Anne-Lise Giraud, Sophie Bouton** (Sponsor: TBC) (Institut Pasteur, Université Paris Cité, Hearing Institute, France, Max Planck Institute for Human Cognitive and Brain Sciences, Germany, Speech therapist, France, Université Côte d'Azur & Centre Hospitalier de Lenval, Laboratoire CoBTeK COgnition Behaviour Technologie, France, Auditory Language Group, University of Geneva, Switzerland, Laboratoire de Sciences Cognitives et Psycholinguistique, Ecole Normale Supérieure, Université PSL, CNRS, France) Can rhythmic auditory stimulation improve the reading performance of dyslexic readers?

20. **Oscar Sill*, Robert Kentridge, Simon Thurlbeck and Dorothy Cowie** (Sponsor: Trevor Crawford) (Durham University, Canadian Institute for Advanced Research, Canada) The developing bodily self: Children's embodiment of virtual avatars and structural body representations.

21. **Petar Atanasov*, Simon Liversedge and Federica Degno** (Sponsor: Simon Liversedge) (University of Central Lancashire, Bournemouth University) A co-registered eye-tracking and fixation-related potentials investigation of parafoveal n+1 and n+2 effects during sentence reading.

22. **Samuel Weiss-Cowie* and Matthew Davis** (Sponsor: Matthew Davis) (University of Cambridge) Contrasting effects of training set variability and temporal delay on perceptual learning and word learning for speech.

23. **Sophia Shatek*, Sarah Zhang, Bethan Grimes, Anwen Gluyas and Gaia Scerif** (Sponsor: Gaia Scerif) (University of Oxford) Brain connectivity is similar during a physical and digital version of the Corsi block tapping task.

24. **Wei Wu*, Hazel van der Walle, Elizabeth Margulis and Kelly Jakubowski** (Sponsor: Kelly Jakubowski) (Durham University, Princeton University, United States of America) Using music to investigate external and internal constraints on thought generation.

25. **Zo Ebelt*, James Yearsley, Christoph Gallus, Pawel Blasiak and Emmanuel Pothos** (Sponsor: TBC) (City University of London, THM, Business School, Polish Academy of Sciences Cracow Branch, Institute of Nuclear Physics) Probability updating on new information in Bayesian and Quantum frameworks.

Learning to spell in another language.

Marie-Josee Bisson
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The BAST model of spelling (Bilingual Spelling in Alphabetic System) suggests both whole-word form knowledge accessed via a lexical route and knowledge of orthographic regularities from the sub-lexical route inform spelling accuracy in bilinguals (Tainturier, 2019). However, it is unclear whether new FL learners use both types of knowledge when spelling newly acquired words. The aim of the current study was therefore to investigate the development of orthographic knowledge at the beginning of a language learning journey. Participants completed four learning tasks (incidental learning, explicit learning, feedback learning and typing) to acquire the form and meaning of 20 Welsh words. On day 2, participants spelled the Welsh words two ways: spelling from audio and from pictures. We indexed their sub-lexical and lexical knowledge of Welsh through a trigram recognition task and a whole-word form recognition task respectively. Using mixed-effect models, results showed that spelling from audio requires learners to use both emerging knowledge of FL orthographic regularities and whole-word forms. This suggests activation of both sub-lexical and lexical route to spelling. Conversely, spelling from pictures, required learners to rely significantly more on their whole-word form knowledge indicating stronger activation of their lexical representations via the lexical route to spelling.

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Learning words from the company they keep.

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Children often encounter new words surrounded by a broader language context, such as a conversation or story. Yet we know little about how children use context to learn words. One potentially vital route is highlighted by extensive evidence that words similar in meaning occur in similar language contexts. For example, words for fruits occur in the context of ‘juicy’ and ‘sweet’. Thus, a child who knows some fruit words such as ‘apple’ and ‘strawberry’ could learn a similar meaning for ‘lychee’ just from encountering it with ‘juicy’ or ‘sweet’. We investigated this route by developing a novel measure to quantify the tendency for similar words to occur in similar contexts, and using it to test whether the strength of this tendency predicts word learning. Across analyses of language input and word learning in young (0-4 year-old) and school-age (7-12 year-old) children, we found words tend to occur in similar contexts to words similar in meaning that children already know. Moreover, this tendency is a robust predictor of word learning, even controlling for other important predictors such as word frequency and concreteness. Thus, children may learn words by connecting them to known words that occur in similar everyday language contexts.

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The impact of repeated, contextually diverse and semantically diverse text on incidental word learning via reading.

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Previous research has shown that words learned in different contexts are acquired more slowly but learned better than words presented in the same contexts (Pagan & Nation, 2019), indicating that contextual diversity facilitates the storage of context-independent semantic representations (e.g., Bolger et al., 2008). However, it is unclear if this advantage can be observed when words are presented in semantically diverse contexts. In this study, 180 adults learned 30 unknown English words using a word-learning paradigm. During learning, unknown words were presented in the same sentence (repeated), in different sentences with the same topic (contextually diverse) or in different sentences with different topics (semantically diverse). Word learning was measured by comparing sentence reading times before and after learning, and in two comprehension tasks. Results were consistent across all tasks, showing a replication of the contextual diversity effect. Interestingly, words learned in semantically diverse contexts took the longest time to be acquired. Although words in the semantically diverse contexts showed a learning advantage compared to the repeated contexts condition, this advantage was smaller than in the contextually diverse condition. Findings suggest that the type of linguistic diversity influences incidental word learning, providing novel insights into processes underlying word learning.

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Pagan, A., & Nation, K. (2019). Learning words via reading: Contextual diversity, spacing, and retrieval effects in adults. *Cognitive Science, 43*(1), 1-24.

Implicit learning and its relationship with reading development: The mediating role of morpheme discrimination in first graders.

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This study examines the role of implicit learning - the ability to detect regularities in the environment without conscious effort - in English reading during the early stages of reading development. Previous investigations into the relationship between implicit learning and reading have yielded mixed findings, and some have raised the notion that previous implicit learning tasks are unidimensional, and/or that an intermediary variable, such as a metalinguistic skill may mediate the relationship between implicit learning and reading. To explore these possibilities, an implicit learning task comprising four subtests (old-new, co-occurrence, position, generalization) was

administered to 82 first-grade children along with a battery of language and cognitive measures. Significant correlations were observed among the accuracies in the generalization subtest in the implicit learning task, English word reading, and English morpheme discrimination and these correlations remained after controlling for age (in months) and nonverbal intelligence (measured by Ravens). Mediation analysis revealed that the relationship between generalization and English word reading was fully mediated by morpheme discrimination. These findings underscore the multifaceted nature of implicit learning, and provide insights into the potential mechanism through which implicit learning contributes to reading development.

This work was supported by the Ministry of Education, Singapore (MOE-T2EP402A20-0003, MOE-T2EP40223-0007 and MOE-T2EP40223-0011).

Impact of PTSD on control of eye movements and saccadic inhibition during pro- and anti-saccades.

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Post-traumatic stress disorder is associated with deficits in attentional control and inhibition. The current study used an anti-saccade task to investigate associations between PTSD symptom severity and saccadic indices of response inhibition in a sample of UK service veterans. Participants were required to make a cued saccadic response either towards or away from a salient size distortion of one of two peripheral targets before reporting the orientation of a T within. Red and green central cues were used to cue pro- and anti-saccades prior to display onsets in blocks of trials containing an equal number of both cues in a randomised sequence. Results reveal reduced saccadic accuracy on anti-saccade trials as a function of PTSD severity, indicating difficulties inhibiting a pre-potent saccadic response. The severity of self-report PTSD symptoms was associated with a larger difference in saccadic latencies in the two cueing conditions, with faster correct pro-saccades and slower correct anti-saccades in those with high PTSD. These results are consistent with a PTSD-related decrease in the ability to inhibit a pre-potent saccadic response and support a negative association between clinical symptoms of PTSD and saccadic indices of attentional control.

This work was supported by the Office for Veterans' Affairs.

Mutual prediction under virtual communication: an fNIRS hyperscanning study.

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Fluent communication relies on both predicting others' actions and executing one's own, and it is associated with interpersonal neural synchrony. Disrupted communication, such as that caused by poor internet connectivity, is a common challenge in online meetings and provides a context for examining how communication breakdowns affect interpersonal neural synchrony. In our fNIRS hyperscanning study, we simulated online meetings with connection breakdowns. Participants (N=34 dyads) played a "Spot the Differences" game, where one described and the other identified differences (mutual prediction condition). Noise intermittently obscured the speaker's voice, creating

partial (one-way prediction) and complete (zero prediction) conditions. Our results showed that inter-brain coherence observed during mutual prediction (i.e. fluent communication) was significantly decreased in the one-way and zero prediction conditions, particularly in the left dlPFC, TPJ, and STG. These findings support the hypothesis that inter-brain coherence is a potential marker of mutual prediction in social interactions.

Examining rapport between autistic and non-autistic people during online interactions.

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Several studies have reported that autistic people may experience greater rapport with an autistic interaction partner, compared to a non-autistic partner (Crompton et al., 2020; Morrison et al., 2020). However, current research does not yet provide a clear understanding of how or why this improved social connection is achieved. In this study, we investigated whether such benefits extend to online interactions, and whether specific features of social interactions can predict rapport in dyadic interactions. 20 autistic and 20 non-autistic participants engaged in a series of online, one-to-one conversations. Half of the conversations were with a same-neurotype partner and half were with a different-neurotype partner. During each interaction, participants were given a different topic to discuss for three minutes. Participants rated the rapport they felt with their partner at the end of each interaction. Autistic and non-autistic participants rated their rapport similarly across different neurotype partners. These findings are contrary to previous work with in-person interactions, and could indicate that mixed-neurotype interactions may be more successful in the online sphere.

Visual spatial orienting to the gaze of avatars.

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The gaze-cueing effect describes how humans respond more quickly to cued targets that are located congruently to eye gaze. While this effect has been reliably found in empirical research, the stimuli do not reflect faces that would be encountered in normal social interaction. To improve the ecological validity of such research, Virtual Reality (VR) can be used to place participants in immersive environments whilst retaining experimental control. Here, we report a study on gaze-cueing conducted in VR using photorealistic virtual avatars. Fifty-five participants were placed in a virtual environment in front of a male or female avatar. Participants were required to localise a target sphere, which appeared either in the direction of avatar eye-gaze (congruent gaze) or to the opposite side of avatar eye-gaze (incongruent gaze) at three different timescales (stimulus onset asynchrony or SOA; 100ms, 300ms, 700ms). We found a main effect of congruency, with targets located more quickly when the avatar gaze was congruent to target location. We also found a main effect of SOA, with targets located more slowly at 100ms than at 300ms or 700ms. These results are consistent with previous research, and act as a first step in validating these avatars as useful research tools.

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Joint 23rd EPS Mid-Career Prize Lecture Symposium

Recent perspectives on the mental lexicon.

Organised by Jo Taylor.

Neural network model insights into lexical ambiguity.

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Lexical ambiguity is a multifaceted construct, sensitive to how different meanings of a word are related, and how such factors interact in different tasks. This talk highlights how neural network modelling can unify diverse experimental results and generate predictions for future research that can in turn inform model refinement. I will first discuss prior work using a neural network model that incorporated specific neurobiological constraints to explain the dynamic nature of meaning activation. This model reveals the processing time-course for words which either do (polysemes) or do not (homonyms) have relate meanings, explaining divergent experimental results from different tasks. Next, I will report recent work using a Large Language Model (LLM) to understand regular polysemy, sets of polysemes that share the same relationship between their meanings, such as CHICKEN and LOBSTER both referring to an animal or its meat. This work indicates that the degree of shared structure varies across different regular relationships (e.g., animal/meat vs. location/organization), potentially reflecting a "regularity continuum". Furthermore, these effects are not necessarily explained by the degree of relatedness amongst word meanings, suggesting that a different principle may influence the emergence of regular polysemes. Overall, this body of work promotes the value of considering representation and processing dynamics, grounded in domain-general theory, in advancing theories of lexical ambiguity.

The effect of contextual diversity on lexical processing.

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Research into the effects of contextual diversity on lexical processing has flourished in the past 20 years, encompassing diverse tasks, populations and languages, and underpinning influential theories of word learning (Nation, 2017). However, there is no current synthesis of the findings. We conducted a scoping review to provide a comprehensive synthesis of this field. 86 articles (145 experiments) met pre-registered inclusion criteria, including behavioural studies (N=111), computational modelling studies (N=20), and corpus validations (N=14). We show that the terminology used to refer to different diversity metrics has been applied inconsistently across operationalisations. For behavioural studies, high diversity facilitates written form processing regardless of operationalisation or task. However, effects on meaning-based tasks are more mixed and may depend on whether precise semantic selection is required. Modelling studies show that the social structure of language influences lexical organization. Corpus validations show that diversity explains more variance in word recognition data than word frequency across languages. This review confirms that diversity in linguistic experience is a key organizational principle of the lexicon, although diversity effects may vary across types of linguistic knowledge and task demands. We recommend that future studies categorise diversity metrics based on how they are calculated, avoiding arbitrary naming conventions.

Prediction error computations support spoken word recognition.

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Spoken word recognition and other aspects of speech comprehension are well explained by Bayesian Inference: perception combines sensory inputs with prior knowledge (predictions). However, the neural and computational implementation of Bayesian theories remains under-specified. This talk will review behavioural and neural evidence for computational accounts of spoken word recognition in which prediction error plays a central role. Presentation of matching written words provides prior knowledge that supports perception of artificially degraded speech (1). However, despite prior knowledge enhancing perception, neural representations of speech are suppressed when clear speech matches predictions. This provides evidence for computations of prediction error and challenges interactive activation or sharpening theories that propose neural representation of posterior probabilities. Recent studies (2) use more natural listening situations in which predictions are based on prior speech content, and clearly-heard syllables match or mismatch with predictions. We report studies using bisyllabic words with first syllables that strongly (*bingo, snigger*) or weakly (*tango, meagre*) predict their second syllables. Opposite effects of lexical prediction strength on neural representations of second syllables are seen for real words compared to pseudowords (*binger, sniggo*) formed from the same syllables. Computational simulations show that these results reflect prediction error computations and challenge sharpening accounts.

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https://doi.org/10.7551/mitpress/11442.003.0022
(2) Sohoglu, E., Beckers, L., Davis, M.H. (in press). Convergent neural signatures of speech prediction error are a biological marker of spoken word recognition. *Nature Communications.* https://www.biorxiv.org/content/10.1101/2023.10.03.560649v3

How does prediction shape skilled reading? Insights from large language models.

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Literate adults consume linguistic information via reading at speeds that eclipse their inborn spoken language abilities. Scholars have long speculated that this efficiency might be achieved through predictive processes, in which readers anticipate upcoming words based on the unfolding context. However, while effects of predictability on reading are well-established, the emerging consensus is that these effects reflect the ease of integrating words in sentence contexts, rather than anticipatory prediction. I describe research that uses a large language model (GPT-2) to compute prediction probability distributions in a large corpus of text, and then investigates whether these distributions predict reading behaviour. The results of these analyses dispute the emerging consensus in showing that (a) text is far more predictable than previously argued and (b) readers use this information dynamically to guide their processing of upcoming words. I suggest that this literature has been hampered by the tools available to characterise predictive relationships (namely, the Cloze task), and

that large language models offer a major methodological advantage in characterising the statistical regularities of language. I close by discussing more broadly where I believe we can use large language models to drive new insights about reading and where the false trails may be.

The contribution of episodic memory and subsequent sleep-related consolidation to the updating of lexical knowledge.

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Traditionally, language and memory research are separate from each other. However, a growing body of evidence shows that language and memory are closely interlinked. A recent theory, known as the episodic context account, highlights a role of episodic memory in language comprehension (Gaskell et al., 2019). It posits that during comprehension, an episodic representation for the discourse is generated, binding different elements (e.g., words) in the discourse together. In turn, this episodic representation may provide a source for updating lexical knowledge and facilitate future comprehension. We tested this account in three experiments, where participants first read familiar words (e.g., helicopter, balloon) in meaningful naturalistic sentences (e.g., the helicopter is not ready for retirement). Following this exposure, we tested processing of the familiar words, both immediately and 12 hours later (including daytime wakefulness or overnight sleep). All experiments showed clear involvement of episodic memory – the specific context in which a word appeared primed subsequent processing of the word towards that context. This priming effect was stronger after sleep than after wake, suggestive of sleep-related consolidation, which is known to stabilise and strengthen episodic memory. This work provides converging evidence for the routine involvement of episodic memory and sleep-related consolidation in language comprehension, which, in turn, provides a source for updating lexical knowledge.

A gradient perspective on the neural basis of semantic cognition.

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Semantic cognition brings meaning to our world – it allows us to make sense of what we see and hear, and to produce adaptive thoughts and behaviour. Since we have a wealth of information about any given concept, our store of knowledge is not sufficient for successful semantic cognition; we also need mechanisms that can steer the information that we retrieve so it suits the context or our current goals. The semantic control network centred on left inferior frontal gyrus and left posterior temporal cortex is associated with controlled semantic retrieval, responding more strongly when weak associations are required or there is more competition between concepts. Evidence from neuropsychology, fMRI and TMS suggests that this semantic control network is distinct from multiple-demand cortex which supports executive control across domains, although challenging semantic tasks recruit both networks. The semantic control network is juxtaposed between regions of default mode network that might be sufficient for the retrieval of strong semantic relationships and multiple-demand regions in the left hemisphere, suggesting that the large-scale organisation of flexible semantic cognition can be understood in terms of cortical gradients that capture systematic functional transitions that are repeated in temporal, parietal and frontal cortex.

End of Symposium

The brain inhibits salient, but not non-salient, distractors in the control of eye-tracking.

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Numerous studies have examined factors that influence whether attention is captured by distractors, often focusing on the roles of bottom-up factors like target salience and top-down control. While these studies tend to emphasize the capture of attention, in everyday situations, we are typically adept at suppressing visual distractions to focus on the object of interest.
This raises key questions: How is suppression of distractors achieved? Is attention solely drawn to the most salient object, or does processing at the distractor's location play a role? How long does this inhibition last, and is it based on the distractor's identity or location? Can this inhibition handle multiple distractors, and how important is distractor saliency?
To address these questions, the Inhibition of Recent Distractor (IRD) Task, introduced by Crawford et al. (2005), was used. In this task, a peripheral target is presented along with a distractor, followed by a new target appearing either at the previous target's location (T-T), a new location (T-N), or the previous distractor's location (T-D). Initial findings showed active inhibition of the distractor's location for up to 5 seconds, which is location-based. Recent studies confirmed the IRD effect and highlighted the importance of distractor saliency in suppressing multiple distractors.

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Smith, E., & Crawford, T. (2024). The inhibitory effect of a recent distractor: Singleton vs multiple distractors. *Experimental Brain Research, 242*(7), 1745-1759. https://doi.org/10.1007/s00221-024-06846-3

The role of working memory in real world outcomes: Evidence from the ALSPAC cohort.

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Many existing studies have found strong relationships between childhood working memory (WM), real-world outcomes in childhood (e.g. academic achievement) and inattentive behaviours. However, it is unclear whether WM relates to real-world outcomes (e.g. employment, education) and inattentive behaviours in adulthood. We addressed these knowledge gaps using the ALSPAC dataset of 14,541 participants over ~30 years. In a preregistered study we examined whether an experimental adult WM task could predict adulthood life outcomes. Participants completed an N-back task at 24 years of age. Adult WM predicted inattentive behaviours (age 25 years), NEET status (Not in Education, Employment or Training; age 24 years), receipt of means tested benefits (age 25 years), and degree completion (age 29 years). However, after controlling for demographic variables (e.g., sex, ethnicity, maternal education), WM remained predictive only of inattentive behaviours. When IQ was added into the model, WM was no longer predictive of inattentive behaviours. Symbolic IQ was predictive of each outcome and vocabulary IQ was predictive of completion of a degree. We argue that WM is predictive of outcomes in adulthood, though we lack evidence it is a unique predictor. We explore possible reasons for this and implications.

This work was supported by the ALSPAC and the ESRC.

Testing item, chunk, and similarity-based constraints on working memory with the multiple-set paradigm.

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Working memory (WM) is limited to 3-4 items, but people can often overcome this limit by organising information into well-encoded sets of information. When multiple sets of different types of items (e.g., a set of colours, shapes, characters, and symbols) are to be remembered, recall might depend on factors such as the set size, the number of sets, and the similarity between the sets presented for memorisation. We devised a paradigm that allows us to disentangle these three constraining factors upon WM capacity in both the visual and verbal domains. Previous data with visual stimuli showed evidence of an overarching item-based limitation, no evidence for a similarity-based limitation upon recall of the set prioritised in the focus of attention, and some evidence for a chunk-based limitation under boundary conditions allowing for temporal grouping (Experiments 1-4, Superbia-Guimarães & Cowan, under review). In a new set of experiments using verbal stimuli, we now investigate whether the same limits apply for sets of words defined by distinct semantic categories (Experiments 5-6) and phonological categories (Experiments 7-8). From our current data, the observed general item-based limitation and the absence of a similarity-based limitation uphold for semantic and phonological sets of verbal items.

Reward Spill-Over: The impact of rewarding events on the momentary likelihood to consume a subsequent reward.

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Decisions to consume rewards, such as food, are often influenced by affective processes. Research has traditionally focused on the effects of sustained affective states (‘mood’) on reward consumption. However, affective experiences are dynamic, with abrupt increases of positive affect often occurring after discrete positive events, i.e. other rewards. From the perspective of a general, domain-unspecific reward system, the activation elicited by those rewards should increase the likelihood of engaging with other reward opportunities in temporal proximity to the original reward. In a series of experiments, we demonstrate such momentary amplification of reward consumption by a preceding positive event. Using a quiz paradigm with positive/negative feedback after each answer, we showed that positive feedback increased the likelihood of snacking after the feedback. Single-trial modelling of binary snacking decisions showed that the likelihood of reward consumption linearly increased with subjective positive affect and unexpectedness of the feedback (reward prediction errors). Positive feedback also increased implicit reward responses, reflected in prolonged viewing of erotic pictures. Together, these findings indicate that increased reward consumption after positive events is caused by a spill-over of activation in the reward system. Short bouts of such activation seem to increase the likelihood of reward behaviours across domains.

Variations in the processing of the structure of predictive, non-predictive and uncertain cues. Association or Unitization?

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Studies have shown that more attention is allocated to cues that are predictive, rather than non-predictive, of relevant outcomes. Studies have also shown that attention is elevated towards cues that have an uncertain association with outcomes. Our previous research extended these findings to show that memory for associations between simultaneously presented cues is better for pairs of predictive cues than non-predictive cues; however, there was no effect of outcome uncertainty on memory performance. Our previous approach used direct recognition tasks that asked participants which cues were paired together. Experiment 1 extended the generality of these findings by using an indirect task in which participants were presented with cue combinations and asked to indicate if these combinations were novel or old. The novel combinations involved a change in either a predictive or a non-predictive cue. Consistent with our previous findings, accuracy was higher if the change occurred in one of the predictive rather than non-predictive cues, while outcome uncertainty had no effect on performance. Experiment 2 investigated the differential deployment of configural representations to uncertain, predictive and non-predictive pairs of cues. These results are discussed in the context of stimulus unitization during learning.

This work was supported by the ESRC.

Influence of predictability on sensory processing and cognitive resource allocation.

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Our sensory systems constantly receive new information. We exploit predictable environmental cues to navigate the dynamic world efficiently, and the presence of predictability influences stimulus perception, processing, and attention. While some theories suggest that predictability attracts attention and heightens arousal, others argue that regularity facilitates processing. Underlying the latter is the theory that, for predictable stimuli, we can shift from demanding bottom-up processing to more efficient top-down mechanisms. In this scenario, prior information is used to generate predictions about incoming sensory input. The neural system monitors prediction errors-deviations from the predictive model-rather than processing each stimulus anew (i.e., predictive coding). This talk will present data from behavioural (under review), pupillometry (Milne et al., 2021, J. Neuro), and EEG studies (in preparation) that manipulate the predictability of rapid tone sequences. It will provide evidence that predictability aids sensory processing and reduces cognitive effort. Additionally, examining how predictability influences the processing of incoming information, including neural responses to auditory sequences and the modulation of behavioural and neural responses to unexpected stimuli based on preceding predictability. Overall, these insights enhance our understanding of how cognitive systems adapt to the constant flow of information in our dynamic environment.

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Joint 23rd EPS Mid-Career Prize Lecture

Title TBC.

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Abstract.

Flanker task performance and neural efficiency in multilingual aging.

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Cognitive aging is influenced by genetic, environmental, and lifestyle factors, with bi-/multilingualism linked to more favorable neurocognitive aging (Lindenberger, 2014; Gallo et al., 2022). This study explores how multilingual engagement, measured through Multilingual Language Diversity (MLD) scores (Li et al., 2020), affects brain oscillatory activity and cognitive control using resting-state (RS) and task-based EEG during a Flanker task. We examined whether MLD modulates resting-state alpha and theta power and its impact on task-specific neural dynamics and behavior. These frequency bands are crucial for inhibitory control and interference suppression-key components of language control-and vulnerable to cognitive aging (Glisky & Riddle, 2007). We tested 122 bi-/multilingual participants (ages 18-82), all native Norwegian speakers with high proficiency in English. Higher MLD mitigated age-related changes in RS alpha and theta power. Older adults with higher MLD showed more efficient inhibitory control during the Flanker task, evidenced by a smaller congruency effect (CE) and less alpha suppression. In contrast, lower MLD was linked to larger CE and greater alpha suppression, suggesting less efficient neural processing. These findings suggest that multilingual engagement extends beyond RS dynamics, influencing task-related neural activity and cognitive performance, supporting the role of multilingualism in promoting healthier cognitive aging.

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How robust is the n-2 language repetition cost, allegedly a demonstration of language inhibition?

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Multilingual language production has been investigated using language-cued speeded production of single words, with the language unpredictably switching or repeating from trial to trial. Several studies on trilingual naming have reported an n-2 language repetition cost' - slower naming on the final trial n of the sequence L(A)-L(B)-L(A) relative to L(C)-L(B)-L(A) - and attributed it to language selection via inhibition: in the sequence L(A)-L(B)-L(A) the speaker must switch on trial n to the language just inhibited on trial n-1. However, language cueing studies reporting n-2 repetition costs have used one cue per language (confounding n-2 language repetitions with n-2 cue repetitions) and never included the immediate (n-1) language repetitions typical of most language-switching experiments. Most also required naming of a small set of digits, which may bypass the semantic access usually required for word production. Using a design that avoided n-2 (and n-1) cue

repetitions, we asked fluent trilinguals to name pictured objects in one session with and one without n-1 language repetitions. There was no n-2 repetition cost in either session. We conclude that previously reported n-2 language repetition costs may have been attributable to effects of cue repetition and/or number naming and cannot be attributed to language inhibition.

Experience-dependent neuroplasticity in the hippocampus of bilingual young adults.

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Models of experience-dependent neuroplasticity predict that the acquisition and extensive use of a new skill trigger a nonlinear trajectory of neurostructural modifications, where initial expansion of relevant brain areas subsequently gives way to volumetric renormalizations (Lindenberger & Lövdén, 2019). Such predictions also apply in the domain of additional language(s): learning and/or simultaneous management of two (or more) linguistic systems (Pliatsikas, 2020). In a sample of 69 young adult Russian-English bilinguals, we tested the hypothesis that individual variations in bilingual experience would predict a neuroplastic trajectory of expansion-and-renormalization in the hippocampus, a region particularly amenable to experience-dependent plasticity (e.g., Erickson et al., 2011; Mårtensson et al., 2012). Specifically, we used quadratic regressions to test whether variations in second language (L2) proficiency, L2 age of acquisition and L2 exposure predicted variations in hippocampal gray matter volume. Results revealed an inverted-U shape association (β=-0.0003; p=0.025) between L2 exposure and left hippocampal gray matter volume, in line with previous findings in older adult populations. Our findings contribute to the literature supporting the role of bilingualism as a promoter of experience-dependent neuroplasticity.

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Neurocognitive modulations of the cerebellum of bilingual young adults.

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Growing evidence suggests that individual differences in bilingual experience calibrate to individual degree of neurocognitive adaptation. Frameworks describing mechanisms underlying bilingualism-induced neurocognitive adaptations1-3 posit a shift in reliance for executive control performance from neocortical regions towards subcortical structures and/or posterior regions, such as the cerebellum. This proposed shift reflects increased automaticity and efficiency in bilinguals' executive control due to the extensive cognitive demands of managing multiple competing linguistic systems. Moreover, this shift may have implications for mitigating age-related cognitive decline1. We investigated whether bilingual experience corresponds to neuroplastic changes in the cerebellum and modulates reliance on cerebellar substrate for executive performance. 69 Russian-English bilingual young adults with varying degrees of bilingual experience underwent structural MRI scanning and a Flanker task. Increasing L2 exposure predicted a linear increase in cerebellar gray matter volumes ($\hat{I}^2$=2.36, p=0.035). Moreover, increasing L2 proficiency predicted increased reliance of Flanker performance on cerebellar volumes ($\hat{I}^2$=-6.466, p=0.042). These results support the hypothesis that bilingual experience leads to more automatized management of executive control, more reliant on subcortical/posterior regions, including the cerebellum. The emergence of this shift in youth, before the onset of age-related frontal deficits, carries implications for the proposed benefits of bilingual experience for cognitive aging.

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Processing benefits during code-switched reading in Cantonese-English bilinguals: Evidence from eye movements.

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Code-switching is the practice of mixing languages within or across sentences. Previous studies have observed processing and production costs in cued language switching tasks, but recent studies suggest that costs are not observed when switches are typically observed in everyday conversation and among frequent code-switchers. Many of these studies have also focused on alphabetical languages with little between-language difference. This pre-registered experiment aims to investigate processing costs during naturalistic code-switched reading in Cantonese-English bilingual adults using eye-tracking. Forty-eight highly proficient Cantonese-English bilingual adults read 80 sentences in Cantonese and English, with target words within these sentences presented in either Cantonese or English, yielding a) code-switched and b) unilingual conditions. The results indicated a switch-benefit, evidenced by significantly shorter reading times (gaze durations, go past times, total reading times) on target words (both Cantonese and English) in code-switched sentences compared to unilingual sentences. Additionally, target word reading times were slower when the sentence context was written in Cantonese, but did not differ according to the language of the target word itself. This experiment enhances our understanding of code-switching by providing novel evidence for its benefits during sentence processing and highlights the limitations of current language processing models in capturing bilingual processing.

The production of non-canonical word orders in spoken Mandarin Chinese: Comparing syntactic priming in first, second and heritage language speakers.

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Syntactic priming, the tendency to reuse syntactic structures after exposure, is a key method for studying how linguistic input influences language production (Ferreira & Bock, 2006). Priming effects can persist for a week in bilinguals (Hurtado & Montreal, 2021), but we do not know how this applies across diverse languages and speakers. This study tested syntactic priming of Chinese non-canonical word orders (BA, BEI, and OSV constructions; Hao et al., 2023) in L1, L2, and Heritage Language (HL) speakers. Preliminary findings revealed HL (N=39) speakers exhibited similar patterns to L1 (N=41) speakers, particularly in immediate priming: speakers produced more BA, BEI and OSV responses when the immediately preceding prime had that structure ($ps<0.001$). Both groups demonstrated cumulative priming (i.e., a gradual increase in production of specific constructions with increasing exposure to primes) for BA ($ps < 0.03$), but not for OSV. Cumulative priming for BEI was observed only in L1 speakers ($p = 0.028$). Neither group showed evidence of long-term persistence effects. Data collection for the L2 group is ongoing (N=26) and will provide further comparisons. These findings suggest HL and L1 speakers similarly reuse syntactic structures, but differences in BEI cumulative priming reveal subtle processing distinctions.

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Oral vocabulary and learning to read morphologically complex words: Evidence from eye-tracking.

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Orthographic skeleton effect where readers with oral knowledge form prior expectations of how words are spelled (Wegener et al., 2018, 2020) has consistently been found for novel simple words in eye-movement studies. However, research with morphologically complex words is rather limited. This study investigated whether adult readers form orthographic skeletons for the stems (i.e., bases) of novel words (e.g., nesh) upon oral training of derived (e.g., nesher/neshist) and inflected (e.g., neshed/neshing) forms of these words. Eighty adult English speakers either got derivational or inflectional training. Training status (trained vs. untrained) and spelling predictability (predictable vs. unpredictable) of novel words were manipulated. Following training, participants saw the written form of the novel word stems for the first time, along with untrained items, in an eye-tracking with sentence reading task. As a result, a significant interaction was found between training and predictability (i.e., more pronounced predictability effect for trained compared to untrained conditions) in gaze duration and total reading time measures, which supports the orthographic skeleton effect and replicates the previous eye-movement findings. However, there was no difference between inflectional and derivational training, which suggest that the orthographic skeleton effect applies to the stems of both types of complex items.

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Linguistic and cognitive dimensions of topic- and subject-prominence in Chinese and English.

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While English sentences are centred around the subject, Chinese sentences are often argued to focus on the topic (thematic meaning). Several topic-prominent features (e.g. subject omission) are suggested to be more common in Chinese than in English. However, much of the existing research relies on selective examples and outdated sources, with limited exploration of the cognitive representation of these features in native speakers. This study examined topic-prominent features in Chinese and English through an unbiased comparison and investigated their cognitive representation in native speakers. We analysed four topic-prominent features in texts from high school and A-level

textbooks in mainland China and England, as well as social media posts from platforms like Weibo and Quora. Results showed that certain topic-prominent features differ significantly between Chinese and English, providing meaningful insights of objective analyses. To explore cognitive representation, we conducted forced-choice surveys and structural priming tasks focused on subject omission. Findings revealed that English speakers strongly prefer subject-included sentences, while Chinese speakers frequently omit subjects. Significant priming effects were observed in Chinese speakers but not in English speakers, highlighting distinct cognitive differences in sentence production. These results enhance our understanding of topic- and subject-prominence and their influence on language processing and cognition.

Arousal-linked Bayesian Attention Dynamics during learning.

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When should we forgo focused attention? Humans can explore the environment through visual scanning to actively gather information, and flexibly shift attention towards more relevant sources of information. Adaptive control over attentional exploration and attentional shifts can be particularly challenging under uncertainty, where unexpected events could either arise due to noise, or reflect genuine changes in the environment. What are the computational and psychophysiological mechanisms that guide attention under uncertainty? We conducted an eye-tracking study (n=29), where participants learnt about probabilistically predictive cues and made predictions in a gamified task. We found that errors, which alert the brain to uncertainties in the environment, and pupil-linked arousal, as a crude indicator of noradrenergic activity, independently contributed to both visual scanning and attentional shifts. A Bayesian change-point model best explained participants' predictions, and trial-by-trial belief updates inferred from the model could additionally predict overt attentional shifts. Furthermore, across individuals, prior belief about change was related to the amount of post-error attentional shifts, though it was not significantly associated with visual scanning. These results are in line with the Adaptive Gain Theory of noradrenaline function, and provide empirical evidence for a Bayesian approach linking attention and learning.

Seeing Conflict: Identifying goal conflict attenuates allocation of visual attention to positive stimuli.

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Positive information such as temptations or stimuli related to reward attract attention. This attentional bias is often considered to contribute to maladaptive behaviours such as addiction or self-control problems because it is assumed to be automatic and hard to control. In contrast, we document across two studies how attention allocation to positive stimuli is attenuated when observers identify a conflict between positive information and a more important current goal. In study 1, positive, reward-related information was attended to, but attention was attenuated when participants were instructed that the stimuli would temporarily harm another goal. This effect is visible even without allowing participants to forget about the stimulus' association with reward. In study 2, students

attended away from a positive temptation (i.e., Facebook) when they were prompted to consider it as detrimental to their studying goals but not when they reflected on how it might support their studying goals. This supports our assumption that activating a more important goal by itself does not cause attenuation of attention but the identification of a conflict with a goal. In sum, malleable perceptions of conflict between positive information and important goals shape how observers orient to such information.

Age-related changes in alpha activity during dual-task speech perception and balance.

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Older adults find it more difficult than younger adults to allocate attentional resources between co-occurring multisensory tasks, such as perceiving speech-in-noise whilst maintaining balance. Attentional control may be reflected in oscillatory alpha activity, with increases in activity reflecting inhibition of different brain regions and decreases reflecting neural activation. This study investigated how younger and older adults reallocate attentional resources during dual-task speech perception and balance, and how these age-related changes are reflected in alpha activity. Nineteen younger adults (18-35 years old) and sixteen older adults (60-80 years old) identified words in audiovisual sentences extracted from the Grid corpus. Participants completed this speech perception task with or without background noise, whilst standing in easy or difficult balance positions. Fronto-central and parieto-occipital alpha activity was recorded using EEG, to measure activation in brain regions associated with balance maintenance and audiovisual speech perception, respectively. Mixed ANOVAs revealed that speech-in-noise performance was strongest during the challenging balance condition, in contrast to our hypotheses. Whilst these behavioural effects were not reflected in parieto-occipital alpha power, decreases in fronto-central alpha power were greater in clear listening conditions. Taken together, increasing cognitive load may not always be detrimental to balance in physically and cognitively fit older adults.

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Measuring and explaining individual variability in speech comprehension.

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Individuals vary in how well they understand a speaker's intended meaning. We developed a task to measure this variability. Participants listen to sentences with an AMBIGUOUS word that subsequently disambiguates to an unexpected meaning (The woman disliked the MOUSE because of the noise it made when it clicked). After each sentence, listeners hear the ambiguous word in isolation and define the word meaning as used in the sentence. Experiment 1 (n=67, 19-59 years,

Prolific Academic) used an open-response format (122 items) which showed good split-half reliability (Spearman-Brown corrected correlation coefficient: 0.96, 95% CI[95, .99]). Accuracy (mean = .84, SD = .12) was predicted by vocabulary knowledge and non-verbal IQ, but not age (multiple regression). We optimized the item set (59 items) and created a 4-Alternative Forced Choice format. Piloting (n=40, 19-70 years) confirmed high reliability (0.95, 95% CI[.92, .97]) and variable accuracy (mean = 0.79, SD = 0.21). Experiment 2 (n=29, 48-90 years, CamCAN cohort) showed lower reliability (0.70, 95% CI [.49, .86]. Here, accuracy (mean = .93, SD = .06) was predicted by age, but not vocabulary knowledge or non-verbal IQ. Results demonstrate our task's feasibility, which will support future research exploring cognitive and neural predictors of comprehension success.

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Use of everyday memory strategies predicts subjective cognitive difficulties across the adult lifespan.

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The relationship between everyday cognitive strategy use and subjective cognition suggests an active, compensatory process in response to experiencing difficulties. However, the available evidence tends to focus on specific age groups, and on general cognition or memory performance only. This pre-registered study investigated whether adult age moderates the relationship between strategy use and subjective cognitive difficulties across multiple domains. The sample comprised 606 United Kingdom-based adults aged 18-86 years. Participants completed a survey measuring specific, everyday cognitive difficulties (i.e., attention, language, visual-perceptual ability, and visuo-spatial and verbal memory) and everyday strategy use (generalised and memory-specific). Covariates included gender, depression, anxiety, stress, and the strategy scale not used as the predictor in each model. Moderated regression analyses revealed memory-specific strategy use as the most robust, unique predictor of cognitive difficulties, but no interaction effect was ever observed. The relationship between memory strategies and cognition is therefore pervasive, regardless of stage in the adult lifespan.

Online and offline mechanisms of memory integration over development.

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Learning about the world involves both encoding new experiences and integrating them with other experiences to build a stable repository of knowledge. Single session experiments indicate that adults can integrate related experiences 'online' during encoding, but that children are poorer at this task and only do so when prompted (Schlichting et al., 2022; Shing et al., 2019). In this study, we examined memory integration one week later to test the hypothesis that children instead benefit more from offline memory consolidation processes to integrate information in memory. Children aged 8-

10 years and adults (total n = 319) encoded both overlapping (AB-AC) and non-overlapping (DE) pairs of creatures, objects, and scenes. A two-alternative-forced-choice test was used to examine memory for encoded pairs and integration for non-encoded (BC) pairs. Preliminary analyses indicate that adults were faster and more accurate than children immediately after learning, but not by the one-week follow-up. While children were specifically poorer at integration (BC) versus directly encoded (DE) pairs, this pattern did not change over the week. These findings support the proposal that children benefit more from offline consolidation processes in memory, but suggest that these cannot necessarily compensate for differences in online processing.

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How does existing knowledge affect working memory performance in children?

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Previous research in adults has suggested that a gating mechanism controls the flow of information from long-term memory to working memory. This allows information from long-term memory to enter working memory only when it is beneficial. Meanwhile, information from long-term memory is blocked when it would be harmful to working memory performance. Here, we investigated whether the gating mechanism operates effectively in 7-10-year-old children. Adults and 7-10-year-old children were presented with images of animals and sounds concurrently. The sounds paired with animals were either congruent with existing knowledge (e.g. cow-moo), incongruent with existing knowledge (e.g. cow-baa), or neutral non-words (e.g. cow-jad). After a brief delay, participants were presented with a sound and asked to verbally report the animal it was paired with. In adults, performance for congruent pairings was superior to the other conditions, with no difference observed between the neutral and incongruent pairings. In contrast, children showed superior performance for congruent pairings, intermediate performance for neutral pairings, and the worst performance for incongruent pairings. This indicates that information from long-term memory can interfere with working memory performance in children. These findings suggest that the gating mechanism is not fully developed by 7-10 years of age.

No evidence for a targeted memory reactivation effect on word-meaning priming.

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A homonym's dominant meaning (fence - garden post) is usually more accessible than the subordinate meaning (sword sport). However, exposure to the subordinate meaning may temporarily enhance its accessibility, an effect termed word-meaning priming. Over 12 and 24 hrs, word-meaning priming is maintained by sleep relative to wake, suggesting priming may be supported by episodic representations of previous discourse that are susceptible to sleep-related memory consolidation. We examined this proposal by attempting to bias specific, linguistic related memories for consolidation during sleep using targeted memory reactivation (TMR). In an exposure phase, participants read sentences containing a homonym that referred to the subordinate meaning ('He wanted to learn how to fence') and simultaneously heard an auditory cue (the homonym). During a subsequent nap, half of the auditory (memory) cues from exposure were replayed, along with unexposed (control) cues. After waking, participants completed a word-association task to index word-meaning priming. Overall, there was a significant word-meaning priming effect, but priming was not further enhanced by TMR. However, memory cues elicited enhanced sleep spindle activity relative to control cues, implying some degree of TMR-induced memory reprocessing. These findings suggest a bounded role of sleep in actively consolidating linguistic, episodic memories.

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Symposium in Memory of Andrew Johnson
This charming man: Honouring the life and work of Dr Andy Johnson.
Organised by Mike Page.

Exploring the role of 'item overlap' in the Hebb Repetition Effect.

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In his seminal work, Hebb (1961) showed that the ability to recall the order of a list of digits, in an immediate serial recall task, improves over spaced repetitions of that list of digits, relative to performance on non-repeating lists – the so-called "Hebb Repetition Effect" (HRE). A further finding within the HRE literature, and the focus of my talk, is the 'item-overlap' effect, which states that when a repeating list shares all the same items as those comprising the non-repeating lists, learning is significantly hindered (Page et al., 2013). In this talk I will present a series of experiments looking at various novel findings from my PhD relating to the 'item-overlap' effect, including: the effect of massing versus spacing these 'repeating lists'; degrees of item-overlap between a given 'repeating list' and adjacent 'non-repeating lists'; and the effect of changing the 'item-overlap' between 'repeating' and 'non-repeating lists' during the course of a single experiment. I will discuss the implications of these findings for the modelling of the HRE, and of ISR in general. Specifically, I will discuss two prominent models of ISR: the Primacy Model and the Burgess and Hitch model.

Is there Hebb repetition learning for semantic information?

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Repeating a particular sequence across immediate serial recall trials, results in better recall of that sequence, relative to non-repeated sequences (the Hebb Repetition Effect, HRE). We recently showed a HRE in learning metrical patterns across lists. There has been little investigation, though, of the learning of semantic information in an HRE paradigm. We discuss three experiments (and a fourth experiment in preparation) investigating a possible HRE for semantic information. In Experiment 1, participants were presented lists of six novel exemplars, each belonging to one of six different semantic categories. The order of the underlying semantic categories was constant across list presentations, while the list items were always different. There was no evidence of a semantic HRE. In Experiment 2, we replicated the canonical HRE with exact list repetitions. However, the recall advantage did not transfer to novel lists following the same list-wide semantic pattern. Experiment 3 adopted a typical Hebb repetition paradigm, but participants heard lists of category labels and reconstructed the lists at recall using exemplars of these categories. There was a significant HRE, and possible mechanisms will be discussed during the talk. Overall, findings suggest that there is no learning of semantic sequences in an HRE paradigm.

Modality Matters: Rethinking the changing-state effect in serial recall.

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The extent to which auditory distraction mechanisms operate across modalities is a critical question for theories of short-term memory and attention. Jones et al. (1995) demonstrated that auditory distraction by changing-state relative to repetitive auditory distracter sequences (the changing-state effect) was equivalent across visual–verbal and visual–spatial serial recall tasks, suggesting an amodal mechanism for representing serial order in short-term memory. To test the robustness of this influential finding, we conducted two high-powered replications of Experiment 4 from Jones et al. (1995). In Experiment 1 (n = 64), participants performed both visual–verbal and visual–spatial serial recall tasks under irrelevant sound conditions, without a retention period. In Experiment 2 (n = 128), a retention period was introduced, and the task-modality manipulation was conducted between participants. Contrary to Jones et al., the changing-state effect emerged only in visual–verbal recall across both experiments. These findings challenge the assumption of amodal mechanisms and support modular and interference-based accounts, underscoring the need to rigorously test cross-modal equivalence claims in cognitive theories.

Serial order effects in tactile serial recall: Exploring the contributing roles of executive resources and perceptual attention in the tactile prioritisation effect.

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A growing body of evidence shows that tactile memory operates in a manner analogous to that of other modalities (e.g. Roe et al., 2017, 2024), suggesting cross modality in serial order memory. Short-term tactile memory is typically assessed by presenting a short sequence of tactile stimulations to participants' (visually obscured) fingers. At recall, the participant is required to lift each finger in the order of the original sequence presentation (e.g., Mahrer & Miles, 1999). A number of 'benchmark effects' in serial order memory extend to the tactile domain (e.g., serial position functions; transposition errors; the Hebb repetition effect; and the Ranschburg effect). The present research investigates whether the 'prioritisation effect' (the improved recall of items in a list to which attention is directed via making them more valuable, Roe et al., 2024), already evidenced in the visual, auditory-verbal, and olfactory domains (Johnson & Allen, 2023), can also be demonstrated for tactile stimuli. Across a series of experiments, we present data investigating the contributions of executive resources (via attentional load manipulations) and the effects of perceptual interference (via presentation of a tactile suffix) during the prioritisation of items in tactile serial working memory.

The importance of start-sequences and end-sequences in understanding serial position effects in immediate memory tasks.

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Immediate serial recall (ISR) and immediate free recall (IFR) are two widely-used and highly-influential memory tasks in which participants are presented with sequences of to-be-remembered items (often words), and at the end of the list are required to recall as many of the list items as possible, in either the same order (ISR) or in any order they so wish (IFR). Despite their methodological similarities, their theoretical literatures have largely diverged: ISR is often explained by primacy-dominated theories of working memory, whereas IFR is often explained by recency-dominated theories of episodic memory. Seeking greater theoretical integration, we recently presented new start-end scoring analyses showing that the outputs of the two tasks share similar runs of successive items that include the first and last items– which we term start- and end-sequences, respectively. We report two further experiments manipulating the opportunities for rehearsal/repetition and the effects of a filled delay in the two tasks. Contrary to theoretical orthodoxy, we find considerable similarities between the data for the two tasks, especially when scored using start-end scoring. We discuss how our recent review and new analyses encourage greater theoretical integration between ISR and IFR, and between the Working Memory and Episodic Memory literatures.

Prioritising different forms of binding in working memory: Building on Johnson & Allen (2023).

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There is now a weight of evidence showing that information can be prioritised in working memory via attentional focus for active and accessible retention, typically using paradigms that test memory for unimodal features and conjunctions. However, working memory is multi-domain and multi-modal. The focus of attention, incorporated within the multicomponent model as the episodic buffer, is assumed to broadly capture how such rich and complex information is temporarily and actively maintained. This talk reports a series of experiments that began with a collaboration with Andy Johnson that aimed to extend beyond basic unimodal paradigms by examining how strategic value-directed prioritisation can be applied to working memory for odour-colour binding. Subsequent studies have examined this question when to-be-bound features were separated across visuospatial locations, across visual and auditory modalities, and between verbs and nouns within instructional sequences. This adds generality to our understanding of the relationship between working memory and attention, and helps start to colour in how focused attention might support multi-domain and multi-modality working memory.

End of Symposium

Foveal load reduces efficacy of parafoveal processing during Chinese reading.

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Two substantial eye movement experiments are reported that used the boundary paradigm to investigate how foveal processing load (high/low frequency of a pre-target word) influences efficacy of parafoveal processing of upcoming target word(s) with either zero-, one-, two- or three-character, or full sentence previews in Chinese reading. In Experiment 1, the three target characters comprised a single word while in Experiment 2 they formed multiple words. Pre-target word analyses in both experiments showed an effective foveal load manipulation (frequency effects) and robust preview extent effects at the target words. Target word fixation times increased, and landing positions were more leftward with reduced preview extent. These effects were consistent, but reduced, for multiple relative to single target words, consistent with the MCU hypothesis (Zang, 2019). Importantly, foveal load modulated parafoveal processing; increased target reading time effects (reflecting processing disruption) and leftward target landing position effects (reflecting reduced preview extent) were smaller for high than low foveal load. The results demonstrate clear influences of foveal lexical processing load on temporal and spatial aspects of oculomotor control in reading deriving from effective parafoveal processing. This suggests a degree of refinement is required in relation to the Foveal Load Hypothesis (Henderson & Ferreira, 1990).

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Deficient sensorimotor adaptation in dyslexia.

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Vocal learning—the ability to acquire novel or modify existing vocalisations—has been suggested to be deficient in people with language and literacy impairments. One way to assess vocal learning is by perturbing the auditory feedback someone receives while speaking. For instance, if the speaker is asked to say “head” (/ɛ/), but what they hear themselves say sounds more like “had” (/æ /) the speaker will change their tongue height in subsequent productions of “head” in such a way that what

they perceive fits more closely with the intended vowel1. Previously, we found that adults2 and children3 with dyslexia respond in an atypical way in an altered auditory feedback (AAF) task. Using these data as input for a computational model of speech motor control4,5, the most striking difference between the fitted models for the AAF-response from typical and dyslexic adult readers was that the parameter characterising somatosensory feedback control gain was considerably smaller in the latter group. This suggests that in the face of perturbed auditory feedback, the somatosensory feedback control system in readers with dyslexia does not keep the vocal tract in normal somatosensory configuration as effectively as in typical readers.

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The nature of a writing system shapes the cognitive and neural mechanisms for reading acquisition.

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Since text is a recent cultural invention, the brain must learn to map meaningless visual symbols to meaningful spoken language for any of the world's writing systems. We tested how the brain achieves this by comparing neural activity for artificial writing systems that were either alphabetic (systematic symbol-sound mappings) or logographic (arbitrary symbol-sound mappings). 24 adults learned to read aloud and comprehend 24 novel words written in each system over 10 days. Reading aloud was more accurate and faster for the alphabetic writing system whereas reading comprehension was equally accurate but faster for the logographic system. After training, neural activity during reading comprehension was greater for the alphabetic system in the dorsal pathway, which is involved in mapping from print-to-sound, whereas the ventral pathway, which is involved in mapping from print-to-meaning, was more active for the logographic system. These findings indicate that systematic symbol-sound mappings allowed the brain to bridge the interface between vision and meaning via sound, whereas an absence of systematicity made it more efficient to link vision directly to meaning. Thus, one neural architecture finds different solutions to the problem of reading by capitalising on the statistical properties of culturally invented writing systems.

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Early morphological decomposition is robust to less visible, inconsistent, and obscured morphemes.

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Previous studies have shown that the initial stage of visual word recognition requires an early decomposition stage, where morphologically complex words like teacher are broken down into smaller meaningful pieces called morphemes {teach}+{-er}. However, a great majority of the studies dealt with suffixation, where all morphemes are highly visible and have consistent orthographic forms, thereby making decomposition easy and straightforward. In this study, we conducted a series of experiments that tested the robustness of early decomposition, using Tagalog as a test-case, an understudied language with unique morphological processes. In Experiments 1-2, we found behavioral evidence showing that infixed words, where the affix is within the stem making it less visible [in+tawag becomes tinawag 'called'], were decomposed with similar level of ease as prefixed and suffixed words (Cayado et al., 2023; in prep). In Experiments 3-4, we found neural and behavioral evidence showing that skilled readers of Tagalog can successfully decompose prefixed words with obscured prefix identity [mang+bulag becomes mambulag 'to blind'] and obscured morphological boundary [mang-+palo becomes mamalo 'to slap')] (Cayado et al., under review). Overall, these findings shows that decomposition is much more flexible and robust than previously hypothesized, thereby prompting necessary revisions to existing morphological processing models that subscribe to the importance of highly visible and consistent morphemes (e.g., Beyersmann & Grainger, 2023).

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Cayado, D.K.T., Wray, S., Lai, M.C.H., Chong, A., & Stockall, L. (Under Review). Breaking down complex words is unaffected by morphological boundary opacity: evidence from MEG and behavioral experiments. *Psychonomic Bulletin & Review*.

This work was supported by the Economic and Social Research Council (ESRC) in the United Kingdom [ES/V000012/1].

What and how do we learn about morphemes through reading experience?

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Most words in English and other languages are built by combining smaller units of meaning called morphemes (e.g., teach + -er → teacher). Understanding how a language's morphology works is vital to access the meanings of known words and compute the meanings of unfamiliar words (e.g., tweeter). In English-speaking countries, explicit morphological instruction is limited, so children must learn the meanings of different morphemes through reading. To understand what and how children might learn about morphology through print, we quantified the morphological information available in 1,200 books popular with British children and young people. We then formulated hypotheses on how morpheme learning might occur, and tested these hypotheses using the morpheme interference paradigm with 120 adults. We found that affix knowledge depends on the number of distinct stems with which affixes combine and how easily affixes are detected in complex words. We demonstrate that words requiring specialised etymological knowledge for segmentation do not contribute to affix learning, and affix-like patterns that arise in non-meaningful contexts (e.g., -er in corner) actively harm learning. Our research illustrates how analysis of the linguistic environment can help us make sense of individuals' linguistic knowledge and develop ecologically valid theories of learning.

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A comparison of lexical features in children's video media and child-directed speech.

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Children's vocabulary knowledge is linked to the quantity and quality of language input they experience. Research focusing on children's literature suggests that children who are exposed to books from a young age will encounter new and sophisticated vocabulary that they are unlikely to hear in everyday conversations with caregivers(1). This project extends this work to another important type of language input: video media. We compared a newly created corpus of video media (programmes popular among 3-5-year-olds, ~230,000 words) to child-directed speech (CDS) data from the CHILDES database (~2,590,000 words). In each corpus we examined features of lexical richness that are important to vocabulary acquisition. We found that children's video media had greater lexical diversity, was richer in meaning, and contained a higher proportion of rare words than CDS, mirroring results about book language. We also compared keywords for each corpus (words that are more common in one corpus than the other). Video keywords were acquired later than CDS keywords, but there were no meaningful differences in concreteness or emotional variables between the keyword sets. These findings support the idea that some features of lexical richness arise as a property of storytelling rather than being tied to a particular medium.

Dawson, N., Hsiao, Y., Tan, A., Banerji, N., & Nation, K. (2021). Features of lexical richness in children's books: Comparisons with child-directed speech. https://doi.org/10.34842/5WE1-YK94

14th Frith Prize Lecture

Title TBC.

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Abstract.

Semantic versus episodic memory systems in concrete and abstract conceptual processing.

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Abstract concepts are more flexible and context-dependent than concrete concepts. However, the mechanisms underlying the representational flexibility of abstract concepts remain unclear. We hypothesise that abstract conceptual processing relies on the associative binding of the episodic memory system, enabling the flexible integration of contextual information [1]. In contrast, concrete conceptual processing primarily relies on the semantic memory system. In Pilot Study 1, participants performed concreteness and semantic size judgements of abstract and concrete words with semantic interference (displaying real-life objects as the background of the target words). We found that semantic interference selectively impaired the semantic judgements of concrete words. In Pilot Study 2, participants performed the same semantic judgement tasks with episodic interference. A recognition memory task was employed as episodic interference, with semantic judgements embedded between the memory encoding and retrieval phases. Results showed that episodic interference selectively interfered with abstract word processing in participants who relied more on associative processing strategies in the memory task (measured by effort rating). Our findings reveal a double dissociation between the semantic and episodic memory systems in concrete and abstract conceptual processing, with concrete concepts relying more on the semantic memory system and abstract concepts on the episodic memory system.

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This work was supported by the Bial Foundation (68/2022).

The role of iconic gesture speed in verb-action matching with 2-year-olds, 3-year-olds and adults.

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This study investigated whether hand movement speed in iconic gesture influences verb comprehension in 2-year-olds, 3-year-olds, and adults. In a two-alternative forced-choice task, participants matched a novel verb to one of two action videos, showing human locomotion movements that differed only in the movement rate (fast or slow). We manipulated the iconic gesture speed (fast or slow) that accompanied the novel verb, which matched the movement rate of only one of the action videos. A mixed ANOVA (age: 2-year-olds vs. 3-year-olds vs. adults × gesture speed: fast vs. slow) showed a significant interaction, highlighting developmental differences in the ability to understand and use iconic gesture speed for verb-action matching. While 2-year-olds showed no significant difference between fast and slow conditions, 3-year-olds selected fast actions significantly more often in the fast condition than in the slow condition. Adults also showed the same effect, but stronger. These findings suggest that the ability to use iconic gesture speed for verb comprehension emerges around age 3 and continues to develop into adulthood. Crucially, this study demonstrates that iconic gestures depicting less frequently lexicalised features, such as speed, can influence children's verb comprehension, underscoring their role in early language development.

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Does the conceptual structure of causal events influence the structure selection in Chinese sentence production? Evidence from a syntactic priming study.

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We tested the influence of the conceptual structure of causal events on the structure selection procedure in Chinese sentence production. Using a recall paradigm, we compared the sentence recall of the targets, namely simple sentences (S+V+O) of 40 Chinese native speakers when they were primed with SVO sentences (S+V+O+le) and "bǎ(把)" sentences (S+ba+O+V+le) respectively, with or without resultatives. Within each condition, there were 24 sentences. The results showed that participants could always precisely recall the target sentences as they were presented, no matter what type of sentences they were primed by. In order to figure out the reason for this, we conducted a series of follow-up pilot studies which checked for whether the lack of effect was due to mismatching tense, too weak priming (doubled prime sentences and repetition of the prime) or the ability to hold the sentences in working memory (dual digit span task, different cue word) but still found the same results. Therefore, we conclude that the recall paradigm doesn't work for Chinese speakers' recall of Chinese.

Beyond Correct Responses: Test-Retest reliability of additional verbal fluency measures.

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The Verbal Fluency Test (VFT) is a widely used tool for assessing language abilities and cognitive functions. It requires participants to generate as many words as possible within a specific category (semantic fluency) or that start with a particular letter (phonemic fluency) within a limited time. While VFT performance is traditionally assessed by the total number of correct responses, recent research highlights the theoretical and clinical value of additional measures, such as errors, response latency, clustering, and switching. These measures are often used in assessments involving repeated measurements over time, necessitating robust test-retest reliability for accurate interpretation and application. However, the test-retest reliability of these additional measures remains underexplored. To address this issue, this study investigated the test-retest reliability of various VFT measures in a healthy adult population. Forty-three participants completed an online VFT across two sessions separated by one week, involving both semantic and phonemic conditions. Performance was assessed using correct responses, error counts, response latency, clustering, and switching. Test-retest reliability was evaluated using intra-class correlation coefficients (ICC 2, 1). The results revealed moderate test-retest reliability for correct responses (semantic: ICC = .71; phonemic: ICC = .64), while the additional measures demonstrated reliability ranging from poor to moderate (ICC = .05-.48). These findings provide insights into the test-retest reliability of VFT measures and offer a foundation for future research on the clinical and theoretical applications of these measures, especially in language disorder and cognitive impairment.

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Eyetools: A set of tools for eye data processing, analysis and visualisation in R.

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Eyetools is an open-source R package that provides a set of simple tools that will facilitate common steps in the processing and analysis of eye data. It is designed for use with procedures in experimental psychology, and to be accessible to a broad range of researchers with minimal experience of eye-data analysis. In this presentation I will give an overview of the package, showing the simple steps of processing raw data, extracting critical event related data (i.e., fixations, saccades), through to summarising and visualising events at the trial level (e.g., time on areas of interest). eyetools is freely available to download from CRAN: https://cloud.r-project.org/web/packages/eyetools/index.html

A new method for assessing concurrent pitch and rhythm imagery.

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Most voluntary musical imagery studies focus on either temporal or melodic musical imagery elements, often using non-naturalistic stimuli (ascending scales, Janata & Paroo, 2006) or familiar music like pop songs, which introduce memory demands (Weir et al., 2015; Heaton et al., 2018). Additionally, these tasks focus on a specific, singular musical element in a trial, even when probing multiple, yet do not investigate the processing of multiple musical elements concurrently. Pilot a methodology investigating the parallel processing of pitch and rhythm when imagining music, considering task performance, strategy use, and experiences of task difficulty. The within-subjects design involved participants of varying musical backgrounds hearing a track then choosing the correct track representation from two presented images, with one manipulated in either pitch or rhythm, in mixed order. Tracks were short, novel Bach fugue excerpts represented by abstracted musical notation where vertical or horizontal block changes indicated a pitch or rhythm change, respectively. Participants were directed to replay the track in their heads without external activity (humming/tapping) to determine the correct response. Participants successfully completed the task, performing significantly better on pitch trials than rhythm, indicating a difference in processing despite the intermixed trial design requiring simultaneous encoding. We have successfully piloted a new method to investigate the parallel processing of pitch and rhythm when imagining music, illuminating potential differences in their simultaneous encoding. Future directions include manipulating multiple musical elements in the same trial or using polyphonic melodies.

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Can we identify people who are superorganisers based on their proficiency in various skill areas?

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A superorganiser is an individual with exceptional abilities in coordinating activities to achieve short-term objectives and long-term goals, often surpassing their performance on IQ tests (Shallice & Burgess, 1991). These abilities, including planning, prospective memory (PM), and time estimation, are key components of executive functions. However, the literature presents inconsistent models of the cognitive components underlying executive functions (Baggetta & Alexander, 2016). This study aimed to 1) identify specific cognitive components of executive function; 2) determine which components and traits predict organisational behaviour; and 3) assess whether these components operate independently of IQ. The study recruited 124 participants via Prolific to complete a series of online tasks, including IQ assessments, an organiser questionnaire, PM tasks, time estimation tasks, and a Big Five personality questionnaire. Additionally, 21 participants completed a modified Multiple Errands Test (MET) in-person, followed by the online tasks. Results demonstrated that both empirical measures and self-reported traits significantly predicted everyday organisational behaviours, as assessed by the organiser questionnaire and MET. Importantly, these executive components could not be fully explained by IQ. These findings highlight the importance of skills beyond IQ in supporting organisational behaviour, providing valuable insights for educational and training programs to foster practical executive abilities.

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Shallice, T., & Burgess, P. W. (1991). Deficits in strategy application following frontal lobe damage in man. *Brain, 114*(2), 727-741. https://doi.org/10.1093/brain/114.2.727

Trivia-induced curiosity and incidental word learning.

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Reading trivia questions elicits curiosity. Crucially, questions that induce higher curiosity benefit memory for (unrelated) incidental information presented after the question but before the answer is revealed. Most previous work used incidentally-presented visual stimuli (faces or objects). We used the trivia paradigm to investigate whether high-curiosity states benefit memory for incidentally-presented, unrelated foreign words and their meanings. In two experiments, participants encountered Swahili words and English meanings (Experiment 1: written presentation; Experiment 2: auditory

presentation, with meanings additionally depicted in picture form). In both experiments, they were better at remembering answers to higher curiosity trivia, but their memory for the Swahili word meanings was not affected by trivia curiosity in immediate tests. Experiment 2 additionally included a delayed (24h) test: here, participants were better able to discriminate between target and lure meanings (presented during study, but associated with different words) when both were presented after a high curiosity trivia question. We are collecting a third set of data to confirm whether this finding is robust. If it is, it would be the first evidence that memory consolidation for novel words is enhanced when participants encounter the word in a high-curiosity state.

The processing of the definite article in Brazilian Portuguese: When 'the' carries gender and number marking.

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Two eye-movement studies in reading in English indicate special status of the definite article "the" compared to content words. Angele and Rayner (2013), using a gaze-contingent paradigm, reported that when the preview of a word was a grammatically incorrect "the", it was skipped more often than a grammatical continuation of the sentence. Staub et al. (2018) found that readers noticed the repetition of "the" less frequently than the repetition of content words. We repeated both studies in Brazilian Portuguese (BP), where compared to English, definite articles carry more information in the form of gender and number marks. In a gaze-contingent experiment, we found that the preview of an ungrammatical definite article was skipped more often than a grammatical continuation, replicating Angele and Rayner. The mechanism of automatically skipping an article – even when it is grammatically incorrect – is also present in BP potentially because gender and number marking is typically repeated in the next word. However, contrary to Staub et al., repeated definite articles were noticed nearly as frequently as content words. When directly fixated, definite articles in BP have too much semantic/syntactic information for them to be ignored.

Angele, B., & Rayner, K. (2013). Processing the in the parafovea: Are articles skipped automatically? *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *39*(2), 649-662. https://doi.org/10.1037/a0029294

Staub, A., Dodge, S., & Cohen, A. L. (2018). Failure to detect function word repetitions and omissions in reading: Are eye movements to blame? *Psychonomic Bulletin & Review*, *26*(1), 340-346. https://doi.org/10.3758/s13423-018-1492-z

Error-based learning of grammatical gender systems using semantic cues.

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Although grammatical gender often correlates probabilistically with semantics, training these distinctions in artificial languages has proven challenging. Notably, unsuccessful training paradigms typically employ passive presentation, which may not encourage the predictive, error-driven processing that typifies naturalistic learning. Using a novel 'error-inducing' paradigm, we examined learning of an artificial language comprising nouns split into two gender-classes marked by affixes associated with a mass/count distinction. In training trials, participants heard a prefix-noun-suffix noun-phrase and were asked to click on the matching referent from a choice of two pictures (target / foil). The referent was thus always ambiguous (and no feedback was given), yet in post-tests participants classified the intended referents correctly, and were above chance in assigning gender to novel referents, demonstrating they had learned the appropriate semantic cues. Critically, analysis of eye-movements in training provided evidence that participants (i) fixated referents faster when foil and target came from different gender-classes (cf Lew-Williams, & Fernald, (2010)) (ii) showed this effect more strongly than in a control condition where the relationship between semantics and gender was eliminated. These results suggest that learners can use the prediction error inherent in ambiguity to discriminate the cues to referents and support generalization.

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Individual differences and morphological markedness in the processing of heritage language Spanish gender agreement: An event-related potential investigation.

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This study asks if there are, and if so, what variables explain, individual differences in how markedness affects grammatical gender processing in English-dominant heritage bilingual speakers (HSs) of Spanish (N = 41) during a grammaticality judgement task with EEG. Generalized additive mixed-models were used to extract N400 and P600 ERP signatures for linear mixed-effect regressions of individual differences. The results showed that formal instruction and more Spanish exposure and use resulted in an increased N400 while higher proficiency led to an increased P600 but a decreased N400. These findings support the postulation that the N400 reflects HSs' increased sensitivity to morphology during grammatical processing. Additionally, we found that the effect of exposure and use was specific to the Marked conditions while the effect of proficiency on the N400 effect was restricted to the Unmarked conditions. We interpreted these findings to highlight the potential role of metalinguistic knowledge, be it from formal (Instruction) or potentially informal

(literacy practices-reflected in the exposure and use) sources, on the overall sensitivity to grammatical patterns (morphologically marked agreement patterns; N400), and the role of proficiency in engaging with automatic syntactic processing (P600). Markedness modulates the relative engagement of assistive/metalinguistic strategy vs. automatic grammatical processing.

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The illusive lemma.

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In 1999, Levelt, Roelofs, and Meyer published ‘A theory of lexical access in speech production’. Many authors (3400+ citations) have referred to this theory in studies of word planning, language acquisition, bilingualism and language disorders. We reviewed the literature to determine whether the central claims of the model still hold up. A key assumption is that lexical access begins with the retrieval of a lemma, defined as a grammatical unit, unspecified for meaning or morphophonological form. The notion of abstract lemmas is well motivated within the WEAVER++ computational model by Roelofs (1992, 2014), which captures central aspects of the lemma model, and distinguishes the model from alternatives. But what is the empirical evidence for access to purely grammatical word representations? I report results of an extensive review of chronometric and neurobiological studies testing key predictions derived from the lemma hypothesis in different paradigms. These studies have not ruled out the notion of lemma, but they have not provided any convincing evidence for its role in lexical access either. For various reasons, this picture is unlikely to change with future work. The lemma will remain illusive. I discuss how models of lexical access might accommodate this view.

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Social experience makes unique contributions to conceptual knowledge.

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Social concepts, like TRUSTWORTHY and DEMOCRACY capture the meaning of interpersonal relationships and interactions. Several proposals argue that semantic information derived from social experience makes a unique contribution in the learning and representation of concepts. However, these claims are limited by 1) inconsistencies in the way socialness is defined and measured, and 2) a lack of behavioural evidence. To address this, we first quantified the socialness of 8388 words. Participants (N=605) rated concepts based on their association with social roles, behaviours, places, institutions, values, and ideologies. The ratings demonstrated good reliability and validity. We then conducted behavioural investigations, including a series of multiple regression analyses that capitalized on openly available behavioural mega-studies, and two pre-registered experiments (N=146). We found that socialness facilitates performance across lexical, semantic, syntactic and memory tasks, and accounts for unique variance when compared alongside other semantic dimensions. Finally, we modelled the effect of socialness on the age of acquisition of words, to evaluate its impact in language development. This revealed that that abstract words that are more social are acquired relatively earlier. Overall, our findings are in line with the proposal that social features make conceptual representations richer and facilitate more efficient learning and processing.

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The effect of sleep on consolidating social memories and common ground.

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Sleep consolidation effects are well established in the cognitive domains of memory and language learning, however very little is known regarding sleep effects in social contexts. In two pre-registered experiments, we investigated whether sleep enhances the common ground that interlocutors develop through conversation and the accuracy of social memories.
Participants completed a computerised (Experiment 1; N=97) or face-to-face (Experiment 2; N=96) matcher-director task with two other people (McKinley et al., 2017) before and after 12 hours of sleep/wake. We measured their use of common ground in conversation (i.e. number of words), item recognition and source memory (i.e. who the item was seen with). Both experiments showed

enhanced use of common ground (i.e. fewer words to describe old vs. new items), and more accurate item recognition and source memory after sleep vs. wake. In addition, item recognition and source memory were enhanced for directors vs. matchers. These findings show that sleep can consolidate memories that were encoded in naturalistic social interactions, and that these enhanced representations can alter the efficiency of future social interactions. We attribute these effects to hippocampus-dependent functions during encoding, as conversation requires integration of multiple sources of information, which are reactivated during sleep (Duff & Brown-Schmidt, 2012).

Duff, M. C., & Brown-Schmidt, S. (2012). The hippocampus and the flexible use and processing of language. *Frontiers in Human Neuroscience, 6*, 69.

McKinley, G. L., Brown-Schmidt, S. & Benjamin, A. S. (2017). Memory for conversation and the development of common ground. *Memory and Cognition, 45*, 1281-1294.

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Exploring performance during sustained attention.

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Age has been found to influence the choice of behavioural strategies during sustained attention. While some findings indicate a priority of accuracy over speed in older adults, not all studies agree (Vallesi et al., 2021). It has been suggested that the underlying factor behind this inconsistency may be motivational differences, with older participants compensating for a possible behavioural disadvantage with increased intrinsic motivation to perform accurately. We investigated this in a pre-registered study, using a modified version of the sustained attention to response task in young (n = 25, mean age = 19) and older healthy participants (n = 25, mean age = 69.5). Accuracy was matched through titration of the response window length. Then, all participants were monetarily encouraged to perform better. Both groups responded to the monetary initiative with increasing reaction times and decreasing error rate (prioritising an accuracy-based strategy), but the young participants' accuracy improved significantly more. In addition, older participants reported higher baseline levels of motivation alongside a reduced tendency to further alter performance for money, indicating smaller susceptibility to reward. While the younger sample did not show optimal performance under standard experimental conditions, they demonstrated the ability to outperform older adults once levels of motivation were matched.

Vallesi, A., Tronelli, V., Lomi, F., & Pezzetta, R. (2021). Age differences in sustained attention tasks: A meta-analysis. *Psychonomic Bulletin & Review*, *28*(6), 1755-1775. https://doi.org/10.3758/s13423-021-01908-x

This study was supported by the Economic and Social Research Council (ES/P000681/1) and the Wellcome Trust (209209/Z/17/Z).

Research Plan - How does prediction error influence learning of new word meanings?

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While prediction error (PE) is considered a key mechanism in computational theories of language learning, few empirical studies have explored the role of episodic memory in this process. According to PIMMS model, PE drives episodic memory encoding and retrieval (Henson & Gagnepain, 2010). To test this prediction in the context of word learning, we will use a word-meaning priming paradigm with two sessions: a training session where participants hear sentences introducing new meanings to existing words and a testing session where participants complete a semantic relatedness judgment task and a word-meaning generation task to measure their learning outcomes. The testing session also includes a fill-in-the-blank task and context recall task, both of which are designed to tap into episodic memory. During training, the sentential context before the target word biases participants to expect the old meaning more (high PE) or less (low PE) strongly, while the following context remains the same for them to infer the same new meaning. Reaction time and accuracy score data will be analysed using linear mixed effects model. We hypothesise that new meanings will be learned better and context encoded more strongly in episodic memory in the high PE than low PE condition.

The effect of different pointing gestures on infants' visual attention and word learning during shared picture-book reading.

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This experimental study tested whether index-finger pointing is more effective than thumb pointing or no gesture in guiding infants' visual attention and word learning during shared picture-book reading. In a preferential-looking task, infants watched videos of an experimenter reading a picture-book to them. During training, an experimenter labelled object-pairs while pointing to them using either the index finger, thumb, or no gesture. During testing, infants viewed objects-pairs from training while hearing their labels, but without any gesture. An eye-tracker was used to measure infants' preference for the labelled objects during both the training and test phases. Pilot data from 5 infants (2 girls, mean age: 13.6 months) showed that, during training, infants demonstrated a stronger preference for target objects in the index-finger condition (M=.76) compared to the thumb condition (M=.66) and the no-gesture condition (M=.46). In the test phase, infants showed an equal preference for target objects in the index-finger condition (M=.55) and the thumb condition (M=.56), but both preferences were stronger than in the no-gesture condition (M=.43). Index-finger pointing substantially increased visual attention compared to no gesture, more so than thumb pointing. However, both gestures led to a slight improvement in word learning compared to no gesture.

Statistical learning of graphotactic patterns in non-adjacent dependencies: The role of semantic cues in learning article-noun agreement.

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Graphotactic patterns govern the combinations and orders of letters in written words. How do learners acquire these patterns when they experience new written words, especially if they are not reflected in phonology? Adult participants (N = 58) were exposed to artificial singular/plural noun phrases in an online experiment. Critically, the singular noun ending determined a silent plural suffix, and the mappings were conditioned by frequency (i.e., the number of times participants encountered each mapping during exposure phase) and consistency (i.e., the predictability of the suffix based on the noun ending). Half of the participants received semantic cues (pictures denoting singular/multiple objects) during exposure. Immediately after the exposure phase, we tested learning and generalisation, and then asked whether they were aware of there being patterns in the new language. Overall, participants successfully learnt the graphotactic patterns, and this learning was influenced by frequency, but only for inconsistent items. We did not find conclusive evidence as to whether semantic cues facilitate graphotactic learning. Notably, some participants could explicitly describe the graphotactic patterns, and they outperformed unaware participants at post-test. These findings support a statistical learning account of orthographic learning while highlighting the importance of explicit awareness in this learning process.

Probabilistic structures in implicit and explicit learning: An artificial grammar learning approach.

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Artificial Grammar Learning (AGL) has been extensively used to study the distinction between explicit and so-called implicit learning. However, this area of research has sparked considerable controversy regarding the measurement of implicit learning and even the existence of implicit learning itself (Dienes & Perner, 1999; Shanks & St. John, 1994). Recent work with quantum cognitive models offers hope to resolve this controversy in an innovative, surprising way. In quantum theory, there are states (called superpositions), for which 'introspection' is impossible - that is, the knowledge encoded in a state is inaccessible, without a measurement, and a measurement can alter the state - behaviourally, states can correspond to belief states about some stimulus or situation and measurements to judgments. Recently, Epping and Busemeyer (2023) offered a first attempt to apply these ideas from quantum theory, in categorization. Building in this work, we offer a computational framework for how implicit knowledge could correspond to quantum-like probabilistic information from an AGL task, while explicit knowledge to Bayesian probabilistic information. We describe results from initial AGL experiments, with an explicit vs implicit manipulation, and corresponding computational fits of empirical data with a quantum vs Bayesian model. The results are broadly consistent with our ideas.

A novel multisensory method for examining hallucinations and perceptual aberrations in the laboratory.

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Aberrations in human consciousness (e.g. hallucinations, distortions) are mediated by background trait-based and concurrent state-based fluctuations in neural activity termed 'cortical hyperexcitability' (CH). Previous work from our laboratory has shown perceptual distortions induced by Pattern Glare are exacerbated by concurrent presentation of irritating auditory stimuli, suggesting CH is a domain-general property (Farrelly et al., 2023). Here we developed dynamic visual stimuli, where Pattern Glare gratings reverse in contrast at certain frequencies (which are sometimes neuronally irritating) and added irritating auditory stimuli (frequency-modulated tones). Subsequently, we examine phenomenology of aberrant perceptions (hallucinatory vs distortions) and the multisensory processes underlying them. Phase reversals were presented (creating a perceptual 'flicker') at 3Hz, 10Hz, and 15Hz. Specific trials paired these with simultaneous frequency-modulated tones to create audio-visual stimulation. Participants completed a trait-based questionnaire measure of cortical hyperexcitability developed internally (AVAS). Results show: (i) adding specific flicker frequencies increased the intensity of aberrant experiences versus typical static gratings; (ii) a significant multisensory effect emerged whereby the intensity of reported aberrant experiences increased further with simultaneous audio-visual stimulation. Finally, we examined the relationship between aberrant experiences and specific factors of the AVAS. Collectively, we present a novel paradigm for testing neurocognitive theories of multisensory aberrant experiences.

Farrelly, H.J., Nuttall, H.E. & Braithwaite, J.J. (2023). Cortical Hyperexcitability: A Factor of Predisposition to Multisensory Hallucinations [Conference Presentation]. ECHR 2023, Lubeck, Germany.

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Information seeking without metacognition.

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Humans and other creatures seek information to improve their cognition and behaviour. Theories in cognitive neuroscience, developmental psychology and animal cognition tend to assume a strong connection between information seeking behaviour and explicit metacognition - conscious introspection about our mental states and subjective metacognitive feelings like confidence or uncertainty. However, recent developments in computational neuroscience have stressed that metacognition and uncertainty are not equivalent, and many forms of uncertainty may be monitored in the brain without generating subjective metacognitive feelings. Here, across a series of experiments in adult humans, we show that information seeking and subjective confidence are controlled by distinct forms of uncertainty. In particular, information seeking (but not confidence) is controlled by uncertainty in sampled sensory evidence while confidence (but not information seeking) is controlled by uncertainty caused by decision boundaries. This double dissociation suggests that separate computations in the mind and brain shape confidence and information seeking: undermining the idea that information seeking behaviour always depends on conscious introspection into our own states of mind.

Measuring word meaning knowledge in primary aged children.

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To understand the development of lexical knowledge across the lifespan requires reliable, valid tests of vocabulary knowledge that include a range of different types of words. We present a new word-to-picture matching task for primary aged children that includes relatively unambiguous words such as ‘traffic’, and ambiguous words like ‘jam’ that refer to multiple concepts (i.e. traffic jam vs fruit jam). We compared the utility of two versions of the task that were delivered by researchers within primary school settings: a pen-and-paper format delivered to whole classes, and a gamified version delivered to small groups via tablets and headphones. Results (N=218) confirm relatively high levels

of enjoyment: median rated enjoyment on 9-point scale was 8 for the pen-and-paper format, 9 for the tablet version. Mixed effects analyses confirmed preregistered predictions: accuracy was higher in older children (Year 4, Age 8-9: 86.8%) compared to younger children (Year 1, Age 5-6: 65.6%), and was higher for unambiguous words (87.2%) compared with ambiguous words (65.6%). Exploratory analyses showed that accuracy was higher in the whole-class pen-and-paper version compared with small-group tablet version, perhaps due to sharing of answers between children in the whole-class version.

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The use of context in resolving syntactic ambiguities in Chinese reading.

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In this eye-tracking study, we investigate how context influences syntactic ambiguity resolution in globally syntactically ambiguous Chinese sentences, such as "**三个学校的**实验员参加了培训", which is ambiguous between, "Technicians from three schools……" or "Three technicians from the school……". We also aim to distinguish the theories assuming that syntactic constraints play a privileged role in the initial structure building and ones claiming contextual constraints can interact early with syntactic preferences or even guide initial parsing decisions. For each sentence, we created three different types of context: one biased towards the dominant meaning of the ambiguous phrase, another biased towards the subordinate meaning, and neutral context. Our analyses focused on whether context and syntactic preferences interact early during processing or with some delay. Moreover, if context guides syntactic parsing, we expect to observe no interaction between context and syntactic constraints in fixation times. Our results reveal main context effects at the ambiguous regions in late processing measures, while an interaction was also observed in late eye movement measures at the ambiguous region. The results are therefore consistent with the theoretical accounts that propose a late influence of context on structural building.
This work was supported by the Chinese Scholarship Council (CSC).

Exploring electrophysiological markers of fatigue via EEG using two fatiguing tasks: AX-CPT vs. TLoadDBack.

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Fatigue is a prevalent symptom across a wide range of disorders. Yet physiological markers are not well established even though they are crucial for developing effective treatments for chronic fatigue syndromes (e.g., neuro-stimulation). O'Keeffe et al. (2020) investigated the effects of two tasks used in fatigue research (AX-CPT and TLoadDBack) finding that TLoadDBack induced cognitive fatigue in healthy participants without increasing sleepiness scores (contrarily to the AX-CPT). Additionally, the AX-CPT spans 90 minutes, while the TLoadDBack lasts only 16 minutes, highlighting the

differences in duration and cognitive demand. However, neural mechanisms underlying these tasks remain unclear. Our study aims to explore electrophysiological mechanisms of fatigue using electroencephalography (EEG) as well as physiological responses via cortisol measurements. This within-subjects study involves three lab sessions, with participants performing three conditions in a randomised order: AX-CPT, TLoadDBack, and control (documentary). EEG will be recorded during task performance. Fatigue and sleepiness questionnaires, and salivary cortisol samples will be collected at three time-points: pre-task, ~30 minutes after task-commencement (end of TLoadDBack), and ~90 minutes after task-commencement (end of AX-CPT and Control). Primary outcomes include EEG oscillatory activity and ERPs, cortisol levels, and questionnaires scores. Repeated measures ANOVA will test task and time-point differences. Post-hoc and correlational analyses will identify task-specific patterns and relationships between physiological and behavioural measures. Findings could provide more understanding about mechanisms of fatigue, starting the creation of a basis for targeted chronic fatigue treatment.

O'Keeffe et al. (2020). A comparison of methods used for inducing mental fatigue in performance research: indivdualised, dual-task and short-duration cognitive tests are most effective. *Ergonomics, 63*(1).

Longitudinal associations between cognitive function and specific motor domains in Parkinson's disease.

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Emerging evidence shows associations between global cognition and motor function in PD. Non-tremor motor functions (e.g., walking) overlap with voluntary movement and action selection, and thus likely depend more on cognition than tremor. The present study explored the contribution of global cognition to motor performance in PD. As part of the Oxford QUantification in Parkinsonism (OxQUIP) study, PD patients (N=110) were tested using cognitive (Montreal Cognitive Assessment [MoCA]) and motor (MDS-UPDRS-III) clinical assessments every three months for seven visits. Patients were categorised as cognitively impaired (n=23) or normal (n=80) based on MoCA thresholds. Tremor and non-tremor subscores were derived from corresponding MDS-UPDRS-III items. Analysis of variance revealed no significant effect of cognition on motor performance at baseline. However, longitudinal regression models reveal a significant main effect of cognition on motor performance and a significant interaction between cognition and visit was observed specific to non-tremor performance. Lower MoCA scores were associated with greater decline in non-tremor performance longitudinally. Cross-sectional analyses therefore may be limited in illuminating the relationship between cognition and motor function in PD. This work has implications for investigating prognostic factors for motor impairment in PD.

Investigating prenatal speech processing in foetuses with and without increased likelihood of developing autism: A preliminary analysis.

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When talking to babies, adults use infant-directed speech (IDS) characterized by altered linguistic patterns and prosody. Neonates can discriminate between IDS and adult-directed speech (ADS) and prefer listening to IDS, suggesting a genetic basis for IDS (Kaplan et al., 1996). Infants with increased likelihood of developing autism due to family history show reduced and delayed preferences for IDS, indicating genetic differences in their speech perception (Curtin et al., 2013). However, genetic explanations for IDS overlook prenatal environmental influences. We investigate to what extent IDS sensitivity is predicted by maternal stress in foetuses with and without family history of autism. Foetuses at 32-34 weeks' gestation will be exposed to IDS, backwards IDS (B-IDS), and ADS; currently, data from 70 participants have been collected, 9 data participants with autism. Discrimination of speech conditions will be indexed using foetal heart rate and behavioural measures using 4D ultrasound. Maternal emotional experiences will be measured using questionnaires. We predict that foetuses will show greater arousal in response to B-IDS compared to IDS and ADS. We also anticipate that foetuses with family history of autism and those experiencing greater maternal stress will show smaller differences in sensitivity to changes in speech conditions. Hypotheses will be tested with linear mixed modelling in R.

The effect of language mixing on vocabulary acquisition: A cross-situational statistical word learning study.

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Learning to map novel words onto their intended referents is a complex challenge, and one that becomes even harder when acquiring multiple languages. We investigated how language mixing affected learning novel words in one versus two languages. In a cross-situational word learning study, 80 adult participants learned either one-to-one word-object mappings, or two-to-one mappings, simulating learning one or two languages. We manipulated whether mappings co-occurred locally, where repetitions were prevalent, or whether co-occurrences were more distributed throughout exposure. Learners acquired two-to-one mappings better when they did not occur in local co-occurrences, but there was no effect of learning conditions for one-to-one mappings. Whether participants were proficient or not in an additional language did not have an observable effect on the learning. We suggest that local co-occurrences of multiple labels, as in language mixing environments, enhance the challenge of learning two-to-one mappings, though this effect may only be short-lived.

Harmonizing in Tune: Age of acquisition in melodic recognition.

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Across cultures and languages, the age at which a word is acquired, hereon defined as age-of-acquisition (AoA), is a strong predictor in lexical retrieval such that early-learned words are processed more quickly than late-learned words. An integrated account has proposed that the AoA effect arises from both the mappings between representations and the development of semantic representations. The AoA effect is likely to be larger in tasks necessitating semantic processing and when the mapping between representations is arbitrary. However, the role of AoA in music, where semantic processing may be less prominent, remains unclear. This study investigated how AoA generalizes to music, using melody-melody verification, melody-title verification, and title-melody verification tasks. While the AoA effects were observed, their influence was limited. Notably, AoA impacted performance only when the prime was a title and the target was a melody. In addition, the AoA effects were more pronounced for low-arousal items than high-arousal items, while the AoA effect was larger in verification responses than falsification responses in title-melody verification task. These findings suggest that AoA plays a role in melody recognition but its influence depends on the task demands and the emotional nature of the stimuli.

Expectations about precision in the human brain.

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Expectations about the clarity of ‘precision’ of the sensory world can alter metacognition and perceptual awareness - such that we feel more confident, and visions seems more vivid when sensory signals are expected (Olawole-Scott & Yon, 2023). These results support an influential but largely untested tenant of Bayesian models of cognition: agents do not only ‘read out’ the reliability of incoming sensory information but integrate prior knowledge about how reliable or ‘precise’ different sources of information are likely to be. In this study, we extended this work - investigating how expectations about precision alter representations of evidence reliability in the human brain. In an MRI scanner, participants rated the clarity of moving dot clouds, which they expected to be either ‘strong’ or ‘weak’. Comparing ‘expected’ and ‘unexpected’ trials allowed us to determine how expectations shape neural representations of perceptual precision. Using a whole brain multivariate decoding approach, we found neural representations of perceptual precision (e.g., in visual area MT and the insula), and revealed where in the brain precision representations are altered by expectations. These findings begin to reveal how prior beliefs about the vividness and clarity of the world around us could shape metacognition and awareness.

The role of cognitive control and bilingual experiences in cross-language activation of idiomatic meanings.

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Research shows that language perception in one language is influenced by the other, particularly through translation meaning, a phenomenon called cross-language activation priming (Friesen et al., 2020; Jared et al., 2023). This study will explore how cognitive control and bilingual experience influence cross-language activation priming at the multi-word level from the dominant (L1) to the weaker (L2) language in French-English bilinguals. Participants will hear L2 sentences with L2 translations of L1 idioms or without idioms. Afterwards, they will perform a lexical decision task on a target word, which could be a non-word, an idiom-related word, or an unrelated word. They will also complete tasks measuring cognitive abilities and language background. We predict faster decisions for idiom-related words than unrelated ones. Stronger inhibition control may reduce priming, better working memory may enhance it, and more extensive bilingual experiences may increase priming effects. A general linear mixed model (GLMM) will be used to analyse reaction times and accuracy, using the lme4 package with R (see below for a potential model). logRT ~ 1 + relatedness + (inhibition + working memory) * intensity-diversity + proficiency + duration of bilingualism + (relatedness | subject) + (relatedness | item).

Friesen et al. (2020). The impact of individual differences on cross-language activation of meaning by phonology. B:L&C, 23(2). https://doi.org/10.1017/S1366728919000142

Jared et al. (2023). Cross-language activation of idiom meanings: Evidence from French-, Vietnamese- and Indonesian-English bilinguals. B:L&C. https://doi.org/10.1017/S1366728923000512

Implicit mentalising and its relation to autistic traits.

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Adults with autism spectrum conditions differ from typically developing adults in aspects of social cognition, with some studies showing dissociations between implicit and explicit mentalising. However, it is unknown whether a similar dissociation occurs for autistic traits occurring in the nonclinical population. Here, for the first time, we assessed how autistic traits relate to mentalising measured by the dot perspective task. An online sample of 203 adult participants completed a self-report autism-spectrum quotient (AQ) scale followed by a dot perspective task that required judgements both from their own perspective and that of a human avatar. Errors for own perspective judgements were greater when the avatar's perspective was inconsistent with that of the participant, providing evidence of implicit mentalising. The magnitude of this effect was modulated by AQ, with more interference found for individuals with relatively high AQ scores. By contrast, AQ was not found to modulate a measure of explicit mentalising (self vs other perspective judgments), nor

speed of responding. These results reveal that in the nonclinical population possession of autistic traits is selectively related to implicit mentalising. This finding is discussed in relation to individual differences in self-other distinction ability.

Individual differences in online research: Comparing lab-based and online administration of a psycholinguistic battery of linguistic and domain-general skills.

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Data collected online have shown promising validity and consistency. Yet paradigms that produce sensible data at the group level are not necessarily reliable for individual differences research, which requires precision at the participant level (Hedge et al., 2018). We report scores from a psycholinguistic individual difference battery (Hintz et al., 2024), assessing linguistic experience (antonym production, author recognition, idiom recognition, vocabulary, prescriptive grammar and spelling), speech production (maximal speech rate, Rapid Automatized Naming, verbal fluency), and domain-general skills (Corsi span, digit span, nonverbal IQ). 149 native Dutch speakers participated in the lab and 515 participated online. The data is highly comparable, with most tasks showing <5% difference between data collected in-lab and online. We also fit a Bayesian mixed model and found that almost all credible intervals cross 0. We additionally established measurement invariable through a confirmatory factor analysis. Nonetheless, online participants scored higher on the spelling test, suggesting that they might have sought external help when unsupervised. Online participants also received lower scores for particularly difficult tasks like Raven's Advanced Matrices and under-stimulating tasks like Antonym Production. Overall, however, participants tested online do not necessarily underperform. We conclude that there is reason for optimism regarding individual differences research online.

Hedge, C., Powell, G., & Sumner, P. (2018). The reliability paradox: Why robust cognitive tasks do not produce reliable individual differences. *Behavior Research Methods, 50*(3), 1166-1186. https://doi.org/10.3758/s13428-017-0935-1

Hintz, F., Dijkhuis, M., van 't Hoff, V., Huijsmans, M., Kievit, R. A., McQueen, J., & Meyer, A. S. (2024). Evaluating the factor structure of the Dutch Individual Differences in Language Skills (IDLaS-NL) test battery.

The effect of language experience on classifier-noun production in Mandarin Chinese.

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Language production is sensitive to the distribution of linguistic elements in the language environment. The current study investigates the role of probabilistic information in the production of classifier-noun pairs in Mandarin Chinese. We asked native Mandarin speakers to complete low-constraint sentence fragments ending with the numeral 'one', eliciting responses with classifier-noun combinations. Probabilistic measurements were derived from an adult written language corpus. The analysis revealed that the production frequencies of the classifier-noun pairs were predicted by their corpus-derived probabilities, even when controlling for the probabilities of the individual words. In addition, forward transitional probabilities of the sequences generated from the corpus predicted participants' likelihood to produce a noun, given a classifies. These findings add to the growing evidence that language users draw on their past language experiences with multiword sequences during real-time production. Furthermore, this study validates the corpus-derived measurements, and provides a foundation for future experiments to explore which and how distributional properties influence the processing of classifier-noun pairs.

Exploring error cancellation and stimulus recall for aware and unaware errors.

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Detecting and correcting errors quickly is crucial for preventing accidents. Recent evidence suggests that corrective actions can be taken very quickly even while the erroneous response is still ongoing. This error cancellation effect is characterised by shorter response durations for erroneous responses as compared to correct responses-i.e., a shorter time between keypress onset and release (Foerster et al., 2022). However, it is not currently clear how error cancellation is related to error awareness. Here, we used a modified version of the Lateralized Error Awareness Task (Shalgi & Deouell, 2012) to investigate error cancellation and error awareness. Unexpectedly, we found no evidence of error cancellation in our paradigm. This suggests that error cancellation is task-specific and not universally observed. In addition, we investigated how well participants could remember the stimulus array shown to them at the beginning of a trial. We found that accuracy significantly differed between conditions, with correct trials showing the highest accuracy, aware error trials intermediate accuracy, and unaware error trials the lowest accuracy, suggesting that poor stimulus encoding/memory underlies some, but not all, unaware errors.

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Late maturation of semantic control promotes conceptual development.

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Control processes underpinned by the prefrontal cortex are critical for generating task-appropriate behaviour across cognitive domains, yet this region develops extremely late. Traditionally, this developmental pattern is considered negative but necessary. However, an alternative (yet perhaps complementary) view suggests that a developmental period without control could support learning, particularly in the semantic domain. Here, we exploit a recent computational model to test formally whether late development of the context-sensitive use of conceptual knowledge, or 'semantic control', would promote concept acquisition. Simulations show that late maturation of semantic control and anatomical connectivity conspire to promote conceptual learning. Delayed control speeds conceptual learning without compromising conceptual representations, particularly when control connects to intermediate layers. To assess whether semantic control also develops late in human children, we conducted a meta-analysis of the classic triadic matching task where participants decide which of two options best matches a third. Matching can be based on taxonomic or thematic relations. When these conflict, participants must exert semantic control to determine which relation is task appropriate. Context-sensitivity develops later than conceptual knowledge with large increases between 3 and 6 years. Thus, the protracted PFC development leads to a delay in acquiring semantic control processes, benefiting conceptual learning.

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Do readers use word length information to guide their eyes to a new line of text?

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When we reach the end of one line of text, our eyes need to make a long eye movement to the start of the new line of text (known as a 'return-sweep'). These return-sweep saccades are prone to error due to the long distance the eyes travel. Additionally, because the start of the next line is far into the readers' periphery, there is a significant loss in visual acuity. As such, it is unclear what visual information readers use to make these eye movements. In this study, we systematically manipulated the length of the first two words on the new line in a 2 (first word: short vs long) x 2 (second word: short vs long) design to test if word length information is used in return-sweep planning. If this is the case, then landing positions should shift towards the longer word. The results showed that the length of the first two words had little influence on landing positions, suggesting that readers do not make full use of word-length information. These findings further suggest that readers may use different saccade targeting strategies to plan returns-sweeps compared to the shorter saccades that occur within a single line of text.

Accuracy, confidence and motivation in children's insight problem-solving.

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Moments of insight are associated with accuracy, confidence and motivation in research with adults (Wiley & Danek, 2024). However, little is known about children's insights. We presented 160 children (age: 4–8 years, 47% girls) with a new insight problem-solving task. Across 8 trials, children saw three clues and were asked to find a solution word associated with all three clues. Self-reported and observed aha-experiences were recorded, along with children's solution accuracy and confidence. We found that aha-experiences were associated with accuracy (observed: OR = 11.76, p <.001, Ntrials = 1280; self-reported: OR = 2.26, p =.003, Ntrials = 560). However, there was no association between aha-experiences and confidence (observed: OR = 1.46, p =.138, Ntrials = 1063; self-reported: OR = 0.67, p =.287, Ntrials = 471). To assess children's motivation, they could choose between two bonus tasks after completing a set of the insight task. We found that observed aha-experiences (OR = 1.5, p =.003, Nparticipants = 160), but not self-reported aha experiences (OR = 1.1, p =.644, Nparticipants = 70), were associated with higher likelihood that a child would choose to continue with the same type of task, rather than switching to a new kind of task.

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Bridging phenomenology and neural mechanisms of inner speech: ALE meta-analysis on egocentricity and spontaneity in a dual-mechanistic framework.

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Although inner speech plays a crucial role in cognition and is linked to aberrant perceptions such as auditory verbal hallucinations, its neural mechanisms remain unclear. Previous research has proposed a corollary discharge model that views inner speech as a truncated form of overt speech, relying on speech production. However, this model does not fully capture the diverse phenomenology of inner speech, with recent research suggesting alternative perception-related mechanisms of generation. Here, we present and test a novel dual-route framework for generating inner speech through two mechanisms: a corollary discharge mechanism based in speech production regions, and a perceptual simulation mechanism within speech perceptual regions. These routes are differentially engaged depending on phenomenological qualities of egocentricity (self-other) and spontaneity (deliberate-spontaneous). Using activation likelihood estimation meta-analysis across multiple inner speech studies, we demonstrate that different varieties of inner speech engage distinct neural mechanisms. Speech production areas involved in the motor generation route are activated during highly egocentric and deliberate inner speech, but not during low egocentricity or

spontaneous inner speech. Our findings provide support for a more nuanced understanding of inner speech generation and offer a flexible cognitive framework that bridges the phenomenology of inner speech with its underlying neural mechanisms.

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Memory effects of linguistic prediction.

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Both strongly expected and strongly unexpected information is recalled better than less strongly expected information (Van Kesteren et al., 2012). Different mechanisms may account for this U-shaped relationship: strongly expected information reactivates prior memory traces (Rumelhart, 1980), while prediction error (PE) temporarily enhances episodic memory encoding (Henson & Gagnepain, 2010). Peripheral features of an episode (unrelated to the predicted information) should therefore be better recalled when experiencing PE, yet evidence is limited (e.g., Quent et al., 2022). We investigate the relationship between linguistic prediction and memory: participants view arrays of three images (a random face and two objects) while hearing speech that ends in either a strongly expected way (EC: naming the more plausible object), a strongly unexpected way (PE: the less plausible object) or an unpredictable way (UN: either of two plausible objects). After 24 hours, memory for the images are tested. We predicted enhanced memory for peripheral features of episodes (faces and unnamed objects) from PE trials, however initial results (n=34, collection ongoing) suggest that memory for peripheral features of PE and EC trials is similar. This does not support a unique role of PE in enhancing episodic memory. We discuss these initial results and planned follow-up experiments.

Stimulus visibility influences intuitive judgments and identification in the same way.

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Individuals can intuitively judge whether the fragmented picture of an object they cannot identify depicts a coherent or incoherent (scrambled) object (Bowers et al., 1990). The current preregistered studies extend previous research by manipulating the difficulty levels of the stimuli to examine whether the same processes underlie intuitive judgement and identification. In four online studies and one lab experiment (N = 1,577 adults), participants saw partially occluded pictures of everyday objects. They decided whether the pictures were coherent or incoherent, indicated their confidence on that choice, and tried to identify the object in the pictures. Results indicated that difficulty affected intuition rates and identification rates in the same way. As pictures became less occluded and thus, more visible, both intuition and identification rates increased linearly across all experiments. Occasionally, we observed quadratic trends, suggesting that both intuition and identification rates flattened around medium difficulty. Confidence levels were positively associated with intuition rates. In conclusion, the similarity of patterns in intuition and identification rates suggests that the processes underlying intuition and identification are the same. However, further research needs to corroborate these findings, using different manipulations.

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Global attention style promotes abstract concept generation.

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Concepts are often studied empirically as isolated words, but in real life, they are understood through context. Compared to concrete concepts, abstract concepts like ‘justice’ require integration across more diverse contextual situations to derive meaning - from social justice to environmental justice to procedural justice. Generating concepts from sets of semantic features may thus depend on how we sample and integrate information across these features. We hypothesise that a global attention style facilitates abstract concept generation by promoting broader feature search and integration, whereas a local attention style favours concrete concept generation through a focus on fewer, closely related features [1]. To test this, we conducted a pilot study where participants were primed with a global or local attention style using the Navon letter task (a larger letter composed of smaller letters), followed by a concept generation task where they generated concepts based on nine concrete words. Results revealed significant mediation effects of feature quantity and semantic diversity between attention style and concept abstractness: Participants in the global attention group selected more numerous and

more semantically diverse features, generating more abstract concepts. These findings suggest that global attention facilitates contextualised abstract concept generation by influencing feature sampling strategies.

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Exploring the features of Immersive Virtual Reality that make it a potentially useful pedagogical tool.

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This study explores how the inclusion of a dynamic soundscape in the IVR experience influences learning outcomes and engagement, with participants randomly assigned to the SoundOn or SoundOff condition. Participants (N = 113, 7- to 13-year-olds) had a 10-minute immersive virtual experience on the Silk Road, set 2,000 years ago. Learning was measured with a MCQ quiz; engagement with an adapted Museum Experience Scale1; presence using the Slater-Usoh-Steed presence questionnaire2; and embodiment with an established child-friendly questionnaire3. There was high factual recall on the MCQ quiz (out of 15) in both the SoundOn (M = 9.89) and SoundOff (M = 9.70) conditions, but no significant difference between the conditions, p = .388. There were greater feelings of presence reported in the SoundOn (M = 4.05) compared to the SoundOff condition (M = 3.78), p = .017. Moreover, the greater the feeling of embodiment in VR, the higher the engagement in the experience, p = .010. These results are consistent with the wider body of research that suggests VR can be an engaging educational tool4. The planned next study will explore how the inclusion of two other features of VR: interactivity and haptics influence the success of the VR learning experience.

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Communication mode preferences: The influence of autism diagnosis, camouflaging and anxiety .

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Previous research suggests that autistic people prefer to use written modes of communication over spoken/face-to-face modes, and that this is influenced by anxiety and camouflaging. However, this has not yet been evaluated in comparison with non-autistic people's communication preferences. In this study, autistic and non-autistic participants completed an online survey where they rated how much they liked to use different modes of communication in a variety of contexts. Participants also completed the DASS-21 and CAT-Q. Cumulative link models and post-hoc pairwise tests were used to analyse the influence of diagnosis, anxiety and camouflaging on communication preferences. Results showed that autistic participants were generally less likely to rate communication modes highly compared with non-autistic participants, though in certain contexts there was no ratings difference for some written modes. Anxiety had a complex influence on the communication mode ratings of both groups. Higher camouflaging was generally associated with greater ratings for most communication modes in both groups, except for phone calls for autistic people and face-to-face for non-autistic people. This indicates autistic people do not show increased preference for any communication mode in comparison to non-autistic people, and that anxiety and camouflaging are predictors of communication mode preferences that require further research.

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Effects of culture relatedness on bilingual emotional responses to words: Insights from word norms and event-related potentials (ERPs).

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This study introduces the culture-relatedness of words as a novel variable and explores its impact on the emotional responses of English-Mandarin bilinguals living in the UK, where their second language (L2) is dominant. First, we conducted a norming study to identify emotive words related to participants' native (e.g., bamboo) and residential (e.g., scones) cultures. We then used event-related potentials (ERPs) to examine whether culture-relatedness affects emotional responses to words presented in L1 and L2. We were particularly interested in investigating whether the well-established emotional distance from L2 may be due to cultural distance and whether concepts related to one's native culture in L2 may enhance affective responses. Initial evidence from ongoing data analyses suggests little effect of culture-relatedness on affective responses. This research offers new insights into the interplay of language, culture, and emotion in bilingual contexts, examining how cultural salience modulates emotional responses.

The effect of perceptual salience (sonority, syllabicity) and markedness of grammatical morphemes in the cross-situational learning of morphology.

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Grammatical morphemes being acoustically low salient was speculated to be one of the reasons for its notorious learning difficulty, especially in implicit learning settings (Simoens et al., 2018). This study examines the effect of salience and markedness of grammatical morphemes on tense and number learning in an implicit cross-situational learning (CSL) environment. During each CSL trial, participants (n=117) heard one sentence and selected one of the two scenes they thought the sentence was referring to. There are three conditions (More salient (tense morphemes: [na] [ko] [pau]; number morphemes: [sai], [ti]), Less salient (tense: [nə], [kə], [pə]; number: [z], [d]), and Less salient with default (tense morphemes [nə], null, [pə]; number morphemes (null, [d]). Generalisation tests (Gen-test) (sentences with new nouns and verbs) were placed last. Learning was not found for singular [z] plural [d], while [sai] [ti] were successfully learned, indicating an effect of salience. The effect of markedness was also found as tense was only significantly above chance in the default condition. However, results in the Gen-test indicate all morphemes with consonant+vowel form were perceived and processed. Our results identified the difficulty in processing consonant-only form, lending support to the usage-based explanation of the morphology learning challenge.

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Laying down the law: The velocity curvature power law of biological movement.

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Bodily movements exhibit kinematic invariances, with the 'one-third power law' relating velocity to curvature amongst the most established. Despite being heralded amongst the 'kinematic laws of nature' (Flash 2021, p. 4), there is no consensus on its origin, common reporting practice, or vetted analytical protocol. Many legacy elements of analytical protocols in the literature are suboptimal, such as noise amplification from repeated differentiation, biases arising from filtering, log transformation distortion, and injudicious linear regression, all of which undermine power law calculations. We review prior power law calculation protocols, identifying suboptimal practices, before proposing solutions grounded in the kinematics literature and related fields of enquiry. Ultimately, we synthesise these solutions into a vetted, modular protocol which we make freely available to the scientific community. The protocol's modularity accommodates future analytical advances and permits re-use of modules useful in broader kinematic science applications. We propose that adoption of this protocol will eliminate spurious confirmation of the law and enable more sensitive quantification of recently noted power law divergences. These divergences have been linked to neurochemical disturbances arising from ingestion of dopaminergic drugs, and in neurological conditions such as Parkinson's and autism.

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Research Plan - A Comprehensive Test Battery for Social Cognition.

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Human beings are inherently social creatures, with interactions shaping every aspect of our lives. However, most existing research focuses on single aspects of social cognition, neglecting the interconnected nature of these processes (Bland et al., 2016). Additionally, few studies examine the psychometric properties, such as reliability and validity, of social cognition tasks. Our project aims to build a comprehensive task battery, identifying key latent aspects of social cognition. We will review assessments for 11 socio-cognitive abilities identified in our previous literature review (Happé et al., 2017). Experts will rank approximately 70 tasks/questionnaires, with around 55 selected for further testing. We will recruit 1,250 adults via Prolific to complete the socio-cognitive battery. Data will be analyzed using advanced latent factor modeling to construct a comprehensive model of latent factors. Pilot studies will be conducted to refine the task battery, ensuring state-of-art psychometric properties. By creating a robust and comprehensive test battery for assessing social cognition, this research will provide invaluable tools for future research and applications.

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Understanding Negative Fractions: Evidence from Eye-Tracking.

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Fractions and negative whole numbers are complex numerical concepts often studied in isolation. As such, it remains unclear whether the working mechanisms proposed for each concept individually also jointly apply to the processing of negative fractions. To address this question, adult participants were asked to indicate the numerically larger of two simultaneously presented fractions in a fraction magnitude task while their performance and eye movements were recorded. Fraction pairs were

carefully manipulated according to polarity (positive vs. negative vs. mixed) and common components (numerator vs. denominator). Behavioural and eye-tracking findings indicate that denominator flip (comparing positive fractions with common numerators by considering denominators and reversing the answer), sign shortcut (making decisions for mixed numbers by focusing solely on the polarity sign), and sign flip strategies (comparing two negative numbers by considering their absolute values and reversing the answer) - previously identified for positive fractions and negative integers - also apply to negative fractions. Exploratory analyses revealed individual differences in strategy use for tasks combining sign and denominator flip, suggesting alternative processing strategies. These findings suggest that negative fraction comparison strategies refer to the components (numerator and denominator) of a fraction and their regular or inverse relation to (negative) fraction magnitude.

Distinct mechanisms underlying dialogic and other-people inner speech.

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Inner speech (IS) manifests differently across individuals and can involve dialogues or representations of other people's voices. Current theories [1] propose two mechanisms for IS generation: corollary discharge from covert speech production and simulated speech via perceptual reactivation. Since corollary discharge inherently predicts one's own voice, generating other voices in IS likely relies more on perceptual simulation than corollary discharge. To investigate how these mechanisms support different forms of IS, we combined subjective measures of self and other IS (vividness self-reports) with objective tasks assessing corollary discharge [2] and pitch imagery abilities [3]. Contrary to a two-mechanism model, principal component analysis identified three components: general IS vividness (self and other), corollary discharge, and pitch imagery. Dialogic IS was predicted by general vividness and pitch imagery, indicating it requires vivid speech sensations and pitch manipulation to create distinct voices. Other-people IS was predicted by general vividness, suggesting attribution to others may involve generating vivid speech deviating from the default self-voice. Notably, corollary discharge did not differentiate these inner speech forms, suggesting it may support IS generation generally rather than distinguishing between its varieties. These results suggest IS forms manifest through distinct combinations of mechanisms, rather than purely motor or perceptual processes.

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The interplay of cognition and bilingual repertoires in L3 Learning: An EEG approach.

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In an increasingly multilingual world, acquiring a third language (L3) has become a key area of research. This study explores the interplay between existing linguistic repertoires and L3 acquisition, guided by the Typological Primacy Model (Rothman, 2011), which emphasizes structural similarities between languages. Cognitive processes, particularly inhibitory control and working memory, are identified as critical factors influencing cross-linguistic effects in L3 acquisition. Using electroencephalography (EEG), the study investigates how cognitive processes impact L3 learning in different bilingual groups, including heritage language learners (L1 English, L2 Spanish) and young bilinguals (L1 Spanish, L2 English). The research focuses on morphosyntactic transfer from English to Spanish, examining how native languages shape the acquisition of new grammatical structures. The Language Background Questionnaire (LSBQ3) assesses participants' language history, including proficiency and language dominance. EEG provides insights into the neural mechanisms underlying L3 acquisition, capturing the temporal dynamics of cognitive processes. Cognitive abilities are evaluated through tasks such as Stroop (cognitive control), digit span (working memory), and alternating serial reaction time (implicit learning). The use of an artificial language offers a controlled environment to study cognitive-linguistic interactions. This methodology enhances understanding of the neurodynamics of L3 acquisition, with implications for educational and linguistic interventions in multilingual contexts.

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Research Plan - Subjective confidence in probability judgments: A signal detection perspective.

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Introduction: We intend to use Signal Detection Theory to understand how statistical associations between perceptual stimuli impact performance and subjective confidence in probabilistic judgment tasks. The study focuses on a 'confirmation-based account' for suboptimal probability judgments, which suggests that people's judgments are influenced by confirmation relations, or the support that a certain piece of evidence provides towards a hypothesis. Previous findings showed participants favour confirmed hypotheses over equally likely, but disconfirmed, ones, and indicated that subjective confidence may follow different patterns than accuracy or response time, potentially explained by the agreement/disagreement between probabilities and confirmation relations. Methods: We will test our hypotheses using a 2AFC psychophysical task with a block design, implemented on

Gorilla Experiment builder. In a within subjects-design, we will manipulate the probability of the correct hypothesis in each block, and the agreement between probability and confirmation relations to look at whether and how they affect participants' sensitivity and response bias. Statistical analyses: We intend to adopt a Signal Detection approach to analyse the data. In a 2-way ANOVA, we will look at the effect of posterior probability and agreement between probability and evidence on participants' sensitivity and response bias for accuracy, subjective confidence, and response times.

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Individual differences in L2 speech segmentation: Evidence from auditory statistical learning.

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L2 learners face significant challenges in segmenting words from continuous speech, particularly in immersion settings where word boundaries lack clear acoustic cues. Prior research (e.g., Saffran et al.) highlights that learners can leverage transitional probabilities (TPs) to identify word boundaries in both native and non-native languages. Wang and Saffran (2014) extended this to tonal languages, finding tone cues facilitated speech segmentation only for bilingual speakers. Building on this, my doctoral research examines how individual differences influence statistical speech segmentation in adulthood, with a focus on tonal languages. Sixty native Mandarin speakers will complete a speech segmentation task under two conditions: TP-only or Tone-and-TP. In the TP-only condition, word boundaries are indicated solely by TPs, while the Tone-and-TP condition incorporates both TPs and tonal cues. Auditory discrimination tasks and a battery of auditory acuity tests will measure participants' perceptual abilities. Language experience will also be assessed using the Language History Questionnaire (Li et al., 2020). We predict that while both groups will succeed in segmentation, the Tone-and-TP group will outperform the TP-only group, demonstrating the enhanced role of tone cues. These findings will advance our understanding of how linguistic and individual differences shape L2 statistical learning processes.

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Research Plan - Development of curiosity-based exploration in infancy and toddlerhood.

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This study will examine children's curiosity-based exploration. Previous research has focused on curiosity in infancy (Chen et al, 2022) childhood (Fandakova & Gruber, 2021) and adulthood (Gruber et al, 2014). To stimulate children's curiosity, they will be presented with a blurred object on screen. Using Gaze Contingency, children will choose what they see next: the clear resolution of the blurred object or a clear novel object. Previous research has used Gaze Contingency with these age groups (Poli et al 2024; Wang et al, 2012). Trait curiosity will also be examined in relation to these behaviours, measured by a parental questionnaire. Our first hypothesis is that toddlers will choose to perceive clear resolution images more than clear novel images, significantly more than infants. Our second hypothesis is that children will look longer at clear novel images than clear resolution images, with toddlers' looking times being significantly shorter than infants'. Data will be analysed by dividing the number of times children choose the clear resolution images by the number of trials. A univariate t-test will then be computed to assess whether the findings differ from chance. The results will suggest whether young children seek to resolve their curiosity, induced by blurred images.

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Aptitude-treatment interaction in SLA: A methodological synthesis.

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Meta-analytic research in second language acquisition (SLA) has shown that instruction facilitates L2 learning, with explicit instruction yielding larger gains (Norris & Ortega, 2000; Kang et al., 2019). However, less is known about how cognitive individual differences (IDs) interact with instructional treatments (i.e., aptitude-treatment interaction [ATIs]; Cronbach & Snow, 1977). This study presents a methodological synthesis of 34 ATI studies in SLA, analyzed using an eight-category coding scheme. Despite a growing trend, ATI research remains underdeveloped, particularly in child language learning. Spanish noun-adjective agreement was the most frequently studied structure, and working memory the most examined cognitive ID. Studies typically employed pretest-posttest-delayed posttest designs but relied on brief pedagogic treatments. Statistical analyses were predominantly mean-based (e.g., ANOVA). Overall, our findings contribute to our understandings of the key characteristics underpinning ATI research, as well as its limitations and research gaps, and offer methodological recommendations for conducting more rigorous studies examining this critical research endeavour in SLA.

Do infants and older children benefit equally from iconicity when learning novel onomatopoeias?

Kirsty Green[1], Marcus Perlman[2] and Sotaro Kita[1]
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Iconic words are more prevalent in infant-directed speech than in adult-directed speech; one explanation for this is the possible bootstrapping role that iconicity may play in word learning. Onomatopoeic words imitating animal sounds are especially prevalent in early interactions. However, infants may not be familiar with the real sounds onomatopoeias imitate. It's not clear that infants recognize the iconic mapping between word and animal sound. Here, we tested whether 18-month-olds and 3-year-olds learned onomatopoeic labels for novel objects better than arbitrary labels. 92 children (46 18-month-olds and 46 3-year-olds) were randomly allocated to either the congruent or incongruent group. The congruent group were told onomatopoeic names for toys that matched the real animal sounds they made. The incongruent group were told names that mismatched the sounds the toys made. Later, children were tested on their recall of the toys' names in a two-way forced choice task. Results reveal that while both 18-month-olds and 3-year-olds performed better in the congruent condition, the effect was stronger for 3-year-olds. This suggests that although 18-month-olds recognize iconic mappings, sensitivity to iconicity in onomatopoeias develops with age. Future studies should investigate younger infants to ascertain when they first become sensitive to iconicity in onomatopoeias.

The work is part of my PhD which is funded by the ESRC (Award number ES/P000711/1).

Is implicit mentalising 'social'? Investigating the domain-specificity and developmental trajectory of implicit mentalising.

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Implicit mentalising involves the automatic awareness of others' perspectives. The Joint Simon task demonstrates this as a Joint Simon Effect (JSE): a stronger spatial compatibility effect in a Joint Simon versus an Individual go/no-go task (Sebanz et al., 2003). The JSE may stem from co-representing a partner's frame-of-reference, creating a spatial overlap between stimulus-response location in the Joint (but not Individual) task. However, the JSE's domain-specificity is debated (Dolk et al., 2014). We investigated the potential content of co-representation by replacing typical geometric stimuli with two coloured sets of animal silhouettes (N=52; Wong et al., 2024). Each set was assigned to the participant or their partner. Critically, a surprise image recognition task followed, aiming to identify partner-driven effects in incidental memory exclusive to the Joint (vs. Individual) condition. Results indicated a robust absence of the key JSE (p=.273, BF01=31.25), limiting interpretations of incidental memory findings, with implications regarding JSE's replicability. We are investigating whether this pattern holds in 3.5-to-5-year-old children (N=64, 38 collected), controlling for individual differences in executive function, receptive vocabulary, and explicit ToM. Finally, we are directly replicating the 'traditional' Joint Simon task and our 'novel' adaptations to investigate the JSE's robustness (N=42, 14 collected). Collectively, these results will provide a crucial test of the JSE and its developmental trajectory.

Dolk, T., Hommel, B., Colzato, L. S., SchÃ¼tz-Bosbach, S., Prinz, W., & Liepelt, R. (2014). The joint Simon effect: a review and theoretical integration. *Frontiers in Psychology, 5*. https://doi.org/10.3389/fpsyg.2014.00974

Sebanz, N., Knoblich, G., & Prinz, W. (2003). Representing others' actions: Just like one's own? *Cognition, 88*(3), B11-21. https://doi.org/10.1016/s0010-0277(03)00043-x

Wong, M. K. Y., Bazhydai, M., Hartley, C., & Wang, J. J. (2024). Does implicit mentalising involve the representation of others' mental state content? Investigating domain-specificity with an adapted Joint Simon task. *Royal Society Open Science, 11*(8). https://doi.org/https://doi.org/10.1098/rsos.230239

This work was supported by the North West Social Science Doctoral Training Partnership.

Utilising eye tracking to investigate cognitive changes induced by time pressure in an email judgement task.

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In the context of the digitalised 21st century society, cybersecurity has become a quintessential aspect of everyday life, personal and professional, forming part of the constant fight to defend our data, financial resources and reputation in the face of cybercriminals. Our project focuses on email phishing, not only due to its popularity but also due to its text-based nature, which allows for eye-

tracking technology to be used to gain insight into victims' mental processes. We use eye-tracking to investigate sequential aspects of attention and strategic decision-making when participants (N=60) judge whether emails are phishing or legitimate. We are using an email judgement task and a 'dual-response paradigm', whereby participants view 20 emails (10 phishing/10 legitimate), where every stimulus is shown twice, first under high time pressure (5 s) and then under no time pressure. For each email presentation, participants judge whether the email is phishing or legitimate and provide a confidence evaluation regarding their judgment and a suspiciousness rating. This methodology allows us to explore eye movements when people view potentially malicious emails to reveal context-specific strategies and differences in processing between time-pressured and free-response conditions. Our findings not only inform a theoretical understanding of people's decision-making when confronted with potentially harmful emails but also have implications for mitigating people's susceptibility to phishing.

This work was supported by the University of Central Lancashire Doctoral Training Centre.

Can rhythmic auditory stimulation improve the reading performance of dyslexic readers?

Olesia Platonova[1], Sofya Goldina[1], Céléna Neau[1], Lena Henke[1,2], Ludovica Veggiotti[1], Rémy Masson[1], Émilie Faye[3], Gilles Leloup[4], Silvia Marchesotti[5], Anne-Lise Giraud[1] and Sophie Bouton[1, 6]
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[2] Max Planck Institute for Human Cognitive and Brain Sciences, Germany
[3] Speech Therapist, France
[4] Université Côte d'Azur & Centre Hospitalier de Lenval, Laboratoire CoBTeK Cognition Behaviour Technologie, France
[5] Auditory Language Group, University of Geneva, Switzerland
[6] Laboratoire de Sciences Cognitives et Psycholinguistique, Ecole Normale Supérieure, Université PSL, CNRS, France
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Speech comprehension is hindered in case of deficient alignment between brain rhythms and rhythms of perceived speech. Recent studies suggest a sampling deficit in low-gamma band in dyslexic adults leading to the inability to properly track phonemes in a speech flow and thus, impaired grapho-phonological correspondence deteriorating reading acquisition capacities. Our clinical trial explores the possibility of boosting low-gamma rhythmic activity in the auditory cortex using rhythmic auditory training and compares the results to a more traditional grapho-phonological correspondence training, on a sample of 160 children aged 7 to 9 years. Both trainings are applied for 6 weeks, 15 minutes per day. We assess the reading performance and neural oscillatory activity at the trained frequencies. We hypothesise that rhythmic auditory training may contribute to the restoration of phonological sampling in dyslexic children and therefore may improve reading performance and reading-related skills more than the traditional grapho-phonological correspondence training. Preliminary results on 52 children suggest that dyslexic participants perform poorly on the battery of linguistic tests as compared to a control group and indeed exhibit the sampling deficit in the low-gamma band based on oscillatory neural responses.

The developing bodily self: Children's embodiment of virtual avatars and structural body representations.

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Sensing embodied selfhood is crucial to perceiving and interacting with ourselves and the world, likely achieved by comparing sensory inputs with top-down expectations. In adults, expectations of structural form, e.g. limb position, may be more significant than those of material form, e.g. colour. However, as a child's body grows and structurally changes, are these cues used differently to maintain a coherent embodied self? We presented 38 children (5-10 yrs) and 46 adults (18-42 yrs) four motion-tracked virtual avatars with material and/or structural distortions - as immersive virtual experiences can trigger illusory embodiment of avatars that match core body expectations. We measured subjective embodiment, motor behaviour, and cognitive body representation accuracy in a motion-capture body-pointing task. We find that children selectively: (a) up-weight material form cues for body ownership; (b) prioritise different structural information for body agency; (c) have less accurate whole-body structure representations, though this is unrelated to embodiment differences. Contrastingly, children are adult-like in: (d) highly weighting structural form cues for body ownership; (e) prioritising structural cues for judging body functionality; (f) using body structure to guide exploratory motor behaviour. Overall, we demonstrate both developmental changes and adult-like maturity in how children use body form for embodied self-perception and action.

A co-registered eye-tracking and fixation-related potentials investigation of parafoveal n+1 and n+2 effects during sentence reading.

Petar Atanasov[1], Simon Liversedge[1] and Federica Degno[2]
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Whether readers are able to parafoveally process word n+2 at the point of fixating on word n has been the focus of a number of eye-tracking studies over the past two decades. Existing findings are inconclusive and whether readers lexically process multiple words simultaneously is still debated. In the current experiment, participants' eye movements and fixation-related potentials (FRPs) were simultaneously measured to examine for the first time whether n+2 effects could be observed via their neural correlates during natural reading. Using the boundary paradigm (Rayner, 1975), the parafoveal preview of two target words embedded in one-line sentences was manipulated. One or both target words could be masked by a string of random letters, the two target words could be transposed, or were left intact in preview. Disruption in the eye movement and FRP records was observed mainly during the processing of word n+1. That disruption was primarily driven by the invalid preview of n+1 consistent with an n+1 parafoveal preview effect. Further, disruption associated with the preview of word n+2 was only observable in the eye movement record, and then, only when word n+1 remained intact in preview. The present findings favour serial over parallel lexical processing accounts.

Rayner, K. (1975). The perceptual span and peripheral cues in reading. *Cognitive Psychology*, *7*(1), 65- 81. https://doi.org/10.1016/0010-0285(75)90005-5

Contrasting effects of training set variability and temporal delay on perceptual learning and word learning for speech.

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Perceptual learning and word learning are key adaptive processes in speech comprehension. Little is known about listeners' ability to select the correct form of learning when both may be relevant. For instance, should the speech segment /lɛdər/ be interpreted as an accented form of 'letter' or a new word, 'ledder'? In two online studies, we validated a paradigm for studying both processes and investigated factors affecting performance on measures of each. Our first study (n=108) explored the impact of training stimulus variability, while our second study (n=180) concerned effects of time-of-day and training-test delay. Training involved implicit word learning and perceptual learning using predictive sentence contexts (2). Across both studies, we identified contrasting effects of our experimental manipulations on the two types of learning. While perceptual learning was enhanced by more variable stimulus sets, word learning outcomes were better in groups given more repetitive training. Whereas word learning decayed as a factor of temporal delay, perceptual learning proved more generalizable only after a 12-hour delay. These results provide evidence that perceptual learning and word learning can be induced in a single paradigm and that studies should be designed differently depending on which type of leaning is to be optimized.

[1] Raviv, L., Lupyan, G., & Green, S. C. (2022). How variability shapes learning and generalization. *Trends in Cognitive Sciences, 26*(6), 462-483.

[2] Mestres-Missé, A., Rodriguez-Fornells, A., & Münte, T. F. (2007). Watching the brain during meaning acquisition. *Cerebral Cortex, 17*(8), 1858-1866.

This work was supported by the Gates Cambridge Trust.

Brain connectivity is similar during a physical and digital version of the Corsi block tapping task.

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The Corsi block tapping task is a well-established measure of visuo-spatial working memory, but is not ideal for EEG recordings due to movement artefacts. We compared EEG activity recorded while adults and 4-6 year-old children completed a physical version and a digital screen-based version of the task. 40 young adults, 40 4-year-olds, and 42 6-year-olds completed both versions while we recorded 64-channel EEG. Recruitment was planned a priori to power a between-version difference with frequentist statistics, but we also report Bayes factor. We examined alpha and theta power and connectivity using coherence, as these bands have been shown to reflect changes in visual attention. Behavioural results showed children trended towards better performance on the physical task, while adults performed similarly across modalities. Frequency spectra were similar for both task modalities, though children had more theta power and less alpha power than adults in both tasks. Overall, coherence was higher in adults than children, particularly between frontal and parietal areas. Both tasks showed similar patterns of coherence across regions and age groups. Our findings suggest that a digital version of Corsi blocks is acceptable for use with neuroimaging with children, and produces similar behavioural and neural results to the physical version.

This work was supported by a Leverhulme Trust Research Project Grant, Award number: RPG-2022-072.

Using music to investigate external and internal constraints on thought generation.

Wei Wu[1], Hazel van der Walle[1], Elizabeth Margulis[2] and Kelly Jakubowski[1]
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Everyday thoughts are traditionally considered as a product of internal mental activity and independent of external stimuli or tasks. However, our recent conceptual model proposed that ongoing thoughts could also be shaped by external stimuli like music (Margulis & Jakubowski, 2024). The current study aimed to provide empirical support for our model and investigate how external (i.e., genre) and internal (i.e., age group) factors jointly influence music-evoked thoughts. During our study, we played 30-s music excerpts to 1807 participants and asked them to describe their thoughts during music listening. We combined natural language processing (word2vec) and traditional statistical methods (i.e., ANOVA and linear regression analysis) to analyze the open-text data. Our results revealed, for music excerpts from the same genres or participants from the same age groups, the corresponding thought descriptions shared higher semantic similarity with each other. We also found a range of properties which naturally vary across music genres could explain part of the genre effects, including musical audio features, emotion ratings, and contextual associations of music. The current study not only advanced our understanding of human thought systems, but also emphasized the suitability of using music to investigate humans' high-level cognitive functions, e.g., memory, imagination, and language.

Margulis, E. H., & Jakubowski, K. (2024). Music, Memory, and Imagination. *Current Directions in Psychological Science, 33*(2), 108-113.

This work was supported by a Leverhulme Trust Research Project Grant (RPG-2023-164) awarded to authors KJ and EM.

Probability updating on new information in Bayesian and Quantum frameworks.

Zo Ebelt[1], James Yearsley[1], Christoph Gallus[2], Pawel Blasiak[3] and Emmanuel Pothos[1]
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[2] THM, Business School
[3] Polish Academy of Sciences Cracow Branch, Institute of Nuclear Physics
zoebelt92@gmail.com

Quantum probability models in decision-making can potentially enrich understanding of relevant behaviours and provide formal explanations for misalignments between experimental findings of apparent cognitive fallacies and Bayesian prescription (Pothos & Busemeyer, 2022). In a series of experiments, we investigated updating of beliefs based on single or multiple pieces of information, that is, probability updating. Specifically, we considered probability updating on multiple pieces of

information, given that each piece of information individually had varied impact on the belief. Perhaps surprisingly, it was difficult to establish clear expectations in a Bayesian framework, without several additional assumptions on the relation between the relevant events. We outline the best approach we could identify. Quantum theory does predict strong dependencies of the updated probability from the ordering of the conditionalizing premises. We demonstrate a) a misalignment between observations and classical, Bayesian predictions, b) a degree of opinion change congruent with quantum probability theory and c) a shift in opinion change depending on information ordering, broadly as predicted by the quantum model.

EPS
Experimental Psychology Society

Joint 23rd EPS Mid-Career Prize Lecture

will be delivered by

Prof Jennifer Rodd
University College London

TBC.

5.15pm, Wednesday 2nd April 2025

Biology Lecture Theatre, Furness Building

No registration is required to attend in person.

EPS
Experimental Psychology Society

14th Frith Prize Lecture

will be delivered by

Dr Connor Keating
University of Oxford

TBC.

5.45pm, Thursday 3rd April 2025

Biology Lecture Theatre, Furness Building

No registration is required to attend in person.

APPLYING TO JOIN THE

EXPERIMENTAL PSYCHOLOGY SOCIETY

To apply for membership to the Experimental Psychology Society please go to the EPS website: https://eps.ac.uk/applying-for-membership/ and fill in the form, ensuring all boxes are completed and returning to the EPS Administrator as a PDF file to expsychsoc@kent.ac.uk.

Application forms should be sent to the EPS Administrator by one of the application deadlines, 1st March or 1st September.

All information should be included on the form, not on additional sheets.

Under "Publications", only articles that have appeared in print by the time of nomination, in peer-reviewed psychological or cognate journals, should be listed. Because of space limitations, a complete publication list is not required; *two* recent examples, where the nominee is in a prominent authorship position (e.g. sole, first or last), are sufficient.

Applicants must be nominated by one EPS Ordinary Member.

EPS
Experimental
Psychology
Society

CRITERIA AND PROCEDURES TO JOIN

Soon after the closing date of the relevant deadline, brief details of all candidates will be circulated to members of the Society, who may request further information if they wish. The nomination forms will be considered by the Committee at their Spring and Autumn meetings. The EPS Administrator will check whether each candidate is eligible for admission to Ordinary Membership, i.e. those candidates who have:

a) secured a PhD
b) published at least two independent accounts of their work in a reputable, peer-reviewed psychological journals
c) personally delivered an oral paper or poster to the Society at one of the three EPS scientific meetings held each year

Candidates who do not meet all these criteria can be considered only in exceptional circumstances. Those who are resident outside Europe will be asked for assurance that they can attend meetings reasonably often.

Any candidate not selected as eligible by the EPS Administrator will be informed of this and will be advised whether they may again be proposed for membership in a future year and if so subject to what conditions. The list of those selected as eligible will be put to the Annual General Meeting in January or the Summer Business meeting for approval.

Meeting Accommodation

We recommend booking accommodation as early as possible.

In the city, a 15 minute bus ride away, there are many options including:

Go2 Hotels, King St, Lancaster LA1 1RE. The budget option.

The Borough, 3 Dalton Square Lancaster, LA 1 IPP, Tel 01524 64170.
Housed in a historic building in the centre of town, with a lovely atmosphere serving good food and drink.

The Sun Hotel, 63 – 65 Church Street, Lancaster LA11ET, Tel 01524 66006.
Featuring a restaurant with a lovely atmosphere serving good food and drink.

Toll House Inn, Penny Street, Lancaster LA11XT, Tel 01524 599900.
Featuring lovely bar downstairs, with good local food and beer, small car park.

The Royal Kings Arms Hotel, 75 Market St, Lancaster LA1 1JG, Tel 01524 32451.
Charles Dickens ate some cake here.

There are also two large hotels on the outskirts of town (very quick with a car, more by public transport):

Holiday Inn
https://www.ihg.com/holidayinn/hotels/gb/en/lancaster/xqlcr/hoteldetail

Premier Inn
https://www.premierinn.com/gb/en/hotels/england/lancashire/lancaster/lancaster.html

For a full list contact Tourist Information on 01524 582394.

Travel

By Air

An hourly rail link runs directly between Manchester Airport and Lancaster. For train times, visit National Rail Enquiries.

By Rail

There are direct rail links between Lancaster and many of the UK's major cities and airports. For train times, visit National Rail Enquiries. The 4 bus service operates between Lancaster Railway Station and Lancaster University every 30 minutes Monday to Saturday day times.

By Car

Leave the M6 motorway at Junction 33 and take the A6 north towards Lancaster. If using an online route planner or satnav, use the postcode LA1 4YW. Parking is paid on campus, and there is plenty available.

By Bus

For bus information visit the Stagecoach website for current timetables and further information. The Stagecoach app will give you live bus information. The bus station is situated on Damside Street in the City Centre and most services also stop at Common Garden Street. Service 1/1A provides a direct connection to the University every 10 minutes (term time), Services 100, 4, 4X, 40, 41 and 42 also serve the University, giving a total of 14 buses per hour from Monday to Saturday until 7pm. Additionally, Services 4 and 4X run every 30 minutes between the Railway Station and the University (Monday to Saturday daytimes). Single tickets cost £2.40, and return tickets cost £3.40 (day passes are available for £5).

All buses drop off and collect passengers at the University Underpass.

You can refer to Lancaster University Travel Information for further information.

By Taxi

Taxis are available at the train station in the city centre. Taxi ranks are also available on campus. Local taxi services provide accessible vehicles and offer both male and female drivers: Tel: 01524 848848, or 01524 32090. There have been rumours of an uber being seen somewhere in Lancaster.

Lancaster University Campus Map

Conference Dinner

The conference dinner will be at The Lancaster Golf Club, Ashton Hall, Lancaster LA2 0AJ on Thursday 3rd April, starting at 7.30pm. The Society has arranged a bus to take attendees from campus to the conference dinner, as well as dropping attendees in Lancaster or on campus after the dinner. There is no additional charge for the bus. The bus is due to leave at 7pm from campus and then return from the golf club leaving at 10pm (arriving in town around 10.15pm and at campus around 10.30pm).

To reserve your place, please complete the form through the link below. This form will be available until 5pm on Friday 14th March, or until all spaces have been filled (if this is earlier than 14th March).

When the form has closed, we will send instructions on how to pay and confirm your place at the conference dinner.

The standard dinner cost for EPS members is £39.00 this year. Please note that postgraduates can book at a reduced fee of £24.00, but must provide evidence of their postgraduate status by emailing a letter from their supervisor (or a direct email from the supervisor) to expsychsoc@kent.ac.uk.

If there are any special dietary requirements these will be accommodated.

Starters

Roasted Tomato & Basil Soup
with Crusty Bread Roll (Vegan, GF option without roll)
Chicken Liver Pate (GF option available)
with Toasted Brioche, Apple & Damson Chutney & Dressed Salad Garnish
Crispy Soft-Boiled Egg in Panko Breadcrumbs
with Chilled Asparagus, Garlic Aioli & Rapeseed Oil

Mains

Slow Braised Lamb Shoulder (GF available)
with Creamy Herb Potatoes, Cauliflower Puree, Mint Sauce, Honey-Roasted Vegetables & Rosemary Jus
Grilled Salmon Fillet (GF available)
with Butter Beurre Blanc, Seasonal Greens, Chive Mash & Confit Tomatoes
Chargrilled Halloumi (GF available)
with Duo of Basil & Red Pepper Dressings, Tomato & Pickled Red Onion Salad
Roasted Celeriac with Vegan Crumbly Cheese (Vegan)
with Toasted Hazelnuts, Wilted Cavolo Nero, & Parsley Dressing

Desserts

Warm Sticky Toffee Pudding
with Butter Scotch Sauce & Vanilla Bean Ice-Cream
Baked Vanilla Cheesecake (GF and Vegan available)
with Berry Compote & Raspberry Coulis
White Chocolate & Raspberry Torte
with Freeze-Dried Raspberries

Conference Dinner Booking Form

Eating and Drinking

On campus, there are lots of good places to eat, for a full list of catering outlets.
https://www.lancaster.ac.uk/itpi/lighthouse/outlets

The Deli: just across from the conference lecture theatres, for sandwiches and brunch.

The Marketplace, at the north end of campus tends to have shorter queues.

The Sultan, just near the conference lecture theatres, for South Asian food, and chips, lots of chips.

Coastal Coffee, on Alexandra Square, has toasties and coffee.

Pizzetta Republica, just down the steps from the conference lecture theatres, excellent coffee, and pizzas.

In Town, a few suggestions:
Quarterhouse (Mediterranean) ££, Quite Simply French (French) £££, Etna (Italian, eccentric) £, Spaghetti House (Italian) £, The Sultan of Lancaster (South Asian) ££, Bombay Balti (South Asian) £, Full House Noodle Bar (East Asian) £, Aroma Chef (East Asian).

Good pub-style food at: Toll House Inn ££, The White Cross ££, The Three Mariners ££, The Sun Hotel ££, The Borough ££.

Business Meeting

A Business Meeting will be held on Thursday 3rd April 2025 between 12:00pm and 1:00pm in the Biology Lecture Theatre at Lancaster University, Furness College, Lancaster, LA1 4YW.

AGENDA

25/15 Minutes of the Annual General Meeting, held at University College London on Thursday 9th January 2025

See Attachment 1.

25/16 Matters Arising

25/17 Secretary's Report

25/17.1 Hon. Secretary's Report

25/18 Treasurer's Report

25/18.1 Treasurer's Report

25/19 QJEP Editor's Report

25/19.1 Editor's Report

25/20 Arrangements for Future Meetings

25/21 Any Other Business

25/22 Date, Time and Place of Next Meeting

Attachment 1

Annual General Meeting

The 77th Annual General Meeting was held on Thursday 9th January 2025 from 12:00pm in the Lower Ground Lecture Theatre at the Department of Cognitive, Perceptual & Brain Sciences, University College London, 26 Bedford Way, London, WC1H 0AP with ~50 attendees.

MINUTES

25/01 Minutes of the Annual General Meeting, held on Thursday 4th January 2024

The minutes were approved without change.

25/02 Matters Arising

No matters arising.

25/03 Secretary's Report

25/03.1 Annual Report of the Society

2024 saw three well-attended meetings with excellent prize lecture talks at UCL, NTU and York. Numerous research grants were awarded; 10 Small Grants, 10 Study Visits,2 Kuppuraj Bishop Study Visits, 9 Student Bursaries (URB=7, NGRB=2) and 2 Research Workshops as well as two ECR events at EPS York and the re-launch of the EPS Pairing Scheme.

The AGM was asked to consider allowing Research Plan Posters to be eligible for the criterion to apply for Ordinary Membership, this proposal was approved following clarification that this was to suit the criterion of presenting to the Society and that quality of work was sufficiently tested by needing to publish at least two articles.

25/04 Treasurer's Report

25/04.1 Treasurer's Report

The draft accounts for the financial year ending in September 2024 show that Society funds are stable compared to the previous year, with the decline in royalties from publishing being compensated for with the reduction of costs of meetings and grants. Members were reminded about the increase in membership fees from 2022 and to update standing orders accordingly if not already done.

The Society has now completed the application process to make investments approved by the AGM of 2023, with the next step to start investing in January 2025. A member asked about the ethical and sustainability of the investments and these are listed on the CCLA website but are in line with best practice for charities such as the EPS. Members approved the start of the investments over the next 12-month period.

Members were informed that the Society is now able to Gift Aid donations, which are at no cost to the donor. Members were invited to consider donating to the Society in the future. A member asked about the income from the VRF, which is not high but members were reminded to consider paying this also, especially if presenting research.

Attachment 1

23/05 QJEP Editor's Report

25/05.1 Editor’s Report

Submissions to QJEP are holding steady with the number of downloads increasing, which is a key factor for the publisher, SAGE. Review times are getting faster but there is an issue of papers being outside the scope of the journal, which has resulted in an acceptance rate of 41%. Impact Factor is 1.5 in the new calculations, but there is a lag so this will change in the next year or two to reflect what is currently happening.

The call for Special Issues of QJEP is still open, with three such issues currently active and will likely be very successful. Members were reminded that review and theory papers are always welcome, as less of these are submitted.

The role of Eidtor-in-Chief will be advertised in the Spring, with members asked to think about any possible candidates and make them aware. AH welcomes any contact regarding the role and is happy to answer questions members or potential candidates may have.

25/06 Confirmation of the Fifty-Fourth Bartlett Lecturer

Confirmed

25/07 Confirmation of the Twenty-Fourth EPS Mid–Career Award Lecturer

Confirmed

25/08 Confirmation of the Thirty-Third EPS Prize Lecturer

Confirmed

25/09 Confirmation of the Fourteenth Frith Prize

Confirmed

25/10 Election of Officers and Committee Members

Confirmed

25/11 Admission of Ordinary Members

Confirmed

25/12 Arrangements for Future Meetings

EPS Meeting: Lancaster University, 2nd – 4th April 2025.
This meeting will include the joint 23rd EPS Mid-Career Prize Lecture by Jennifer Rodd (with an accompanying symposium organised by Jo Taylor). There will also be a special symposium in honour of Andy Johnson, organised by Mike Page.
Local Organiser: Padraic Monaghan and Alice Milne

Attachment 1

EPS Meeting: University of Dundee, 8th – 11th July 2025.
This will be a joint meeting with the Canadian Society for Brain, Behaviour and Cognitive Science (CSBBCS), and will include the 53rd Bartlett Lecture by Mike Burton (with an accompanying symposium organised by Rob Jenkins). This meeting will also include the 2025 EPS / BSA Undergraduate Project Prize talk by Akilles Rechardt.
Local Organiser: Lizzie Bradford

EPS Meeting: University College London, January 2026.
Local Organiser: Adam Parker

EPS Meeting: Newcastle University, April 2026.
Local Organiser: Tom Smulders

EPS Meeting: University of Essex, July 2026.
Local Organiser: Maria Laura Filippetti

EPS Meeting: University College London. January 2027.
Local Organiser: TBC

EPS Meeting: Cardiff University. April 2027.
Local Organiser: Rob Honey

EPS Meeting: University of East Anglia. July 2027.
Local Organiser: Louise Ewing

25/13 Any Other Business

Thanks to outgoing committee members; Jennifer Cook, Emma James and Nura Sidarus for all of their work during their three year terms. Another thank you to the meeting organisers; Adam Parker, Jeremy Tree and Sam Hurn.

25/14 Date, Time and Place of Next Meeting

The next business meeting will be on Thursday 3rd April at the University of Lancaster.

Attachment 1.

Admission of Ordinary Members

Under Rule 7 the list of applicants for Ordinary Membership was earlier circulated electronically in the December newsletter. These applications were provisionally approved at the Autumn Committee meeting.

Following the autumn EPS committee meeting, we are delighted to announce the Committee's award nominations for approval at the Annual General Meeting in January 2025.

The Committee seeks approval for the following nominations:

Election of the Fifty-Fourth Bartlett Lecturer
Prof Matthew Botvinick (Stanford University, United States of America)

Election of the Twenty-Fourth EPS Mid-Career Award Lecturer
Prof Elizabeth Jefferies (University of York)

Election of the Thirty-Third EPS Prize Lecturer
Dr Melissa Colloff (University of Birmingham)

Election of the Fourteenth Frith Prize Lecturer
Dr Connor Keating (University of Birmingham)

The Committee submits the following nomination for EPS Honorary President:

Asifa Majid (University of Oxford)

The Committee submits the following nominations for Ordinary Committee Members:

Emily Crowe (University of Nottingham) – ECR Representative

Rachael Hulme (Heriot-Watt University)

Matthew Mak (University of Warwick)

Kay Ritchie (University of Lincoln)

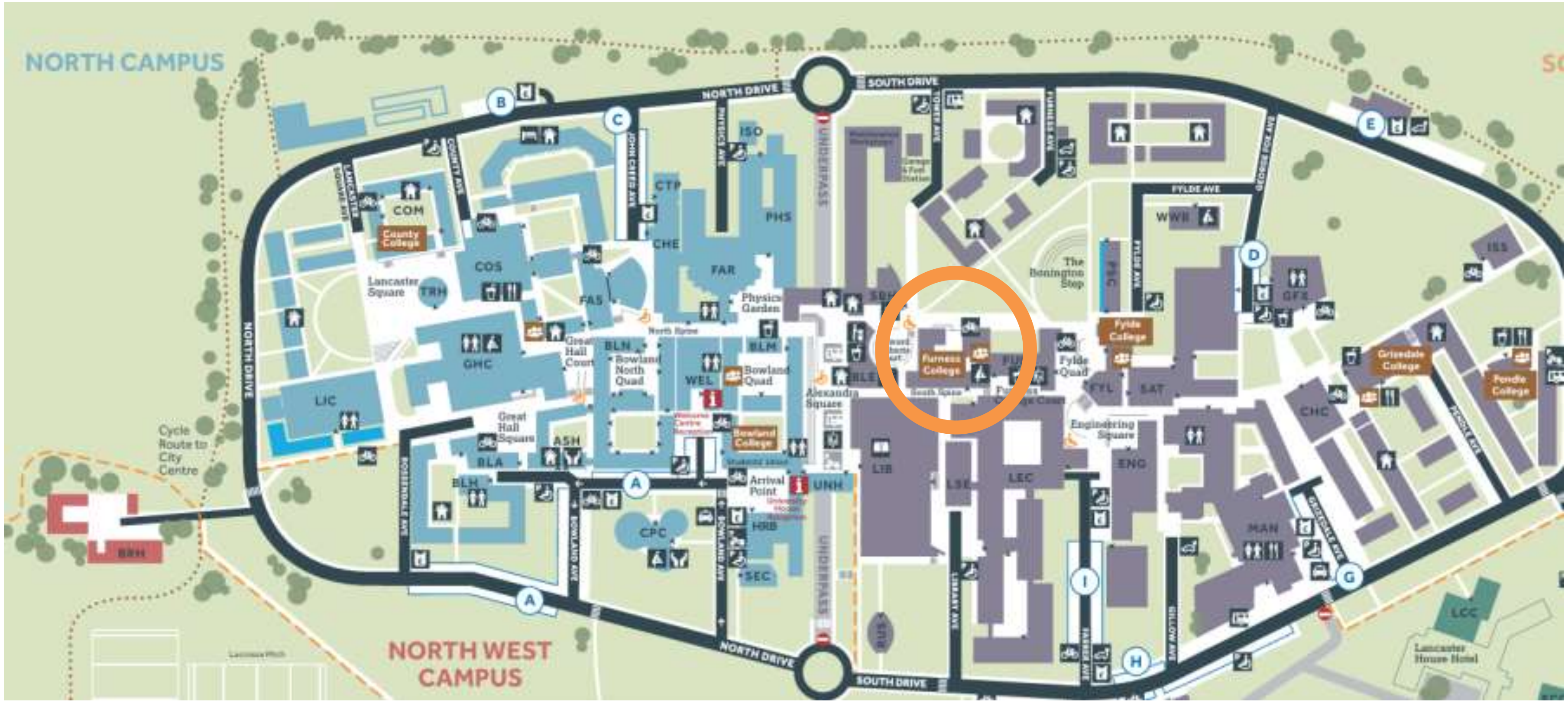
EPS
Experimental Psychology Society

Next Meeting: University of Dundee. 8th – 11th July 2025.

This will be a joint meeting with the Canadian Society for Brain, Behaviour and Cognitive Science (CSBBCS), and will include the 53rd Bartlett Lecture by Mike Burton (with an accompanying symposium organised by Rob Jenkins). This meeting will also include the 2025 EPS / BSA Undergraduate Project Prize talk by Akilles Rechardt.

The portals for this meeting will open at 10am (UK Time) on April 7th 2025.

Local Organiser: Lizzie Bradford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NORTH WEST CAMPUS
NORTH DRIVE
SOUTH DRIVE
UNDERPASS
Cycle Route to City Centre
BRH
LIC
COM
County College
Lancaster Square
TRH
COS
GMC
FAS
CHE
CTP
FAR
PHS
ISO
Physics Garden
BLN
Bowland North Quad
Great Hall Court
Great Hall Square
ASH
BLA
BLH
WEL
Welcome Centre Reception
Bowland College
BLM
Bowland Quad
Alexandra Square
Arrival Point
UNH
CPC
HRB
SEC
Furness College
Fylde Quad
Fylde College
The Bonington Step
PSC
WWR
GFX
FYL
SAT
Engineering Square
ENG
LIB
LSE
LEC
MAN
CHC
Grizedale College
Pendle College
IES
LCC
Lancaster House Hotel
NORTH DRIVE
LANCASTER SQUARE AVE
COUNTY AVE
JOHN CREED AVE
PHYSICS AVE
ROSSENDALE AVE
BOWLAND AVE
TOWER AVE
FURNESS AVE
FYLDE AVE
GEORGE FOX AVE
LIBRARY AVE
FARRER AVE
GILLOW AVE
GRIZEDALE AVE
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