KEELE MEETING

30-31 March 2022
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 Twitter 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 hybrid scientific meeting will be held at Keele Hall, Keele University, ST5 5BG and online, between 30 – 31 March 2022.

The local organiser is Jim Grange.

**10th Frith Prize Lecture**  
*Wednesday 30th March, 5:00pm*

     Interoceptive ability: Measurement, conceptualisation and individual differences.  
     Jennifer Murphy, Royal Holloway, University of London.

**Joint 11th Frith Prize Lecture**  
*Wednesday 30th March, 11:00am*

     Learning new words via reading: The influence of anchoring and contextual variation.  
     Matthew Mak, University of York.

**Joint 11th Frith Prize Lecture**  
*Thursday 31st March, 11:30am*

     A domain-general cognitive core in the human brain.  
     Moataz Assem, University of Cambridge.

**20th Mid-Career Prize Lecture**  
*Thursday 31st March, 5:00pm*

     Becoming a reader.  
     Professor Kate Nation, University of Oxford.

**Poster Session**

The poster session will be held on Wednesday 30th March between 6pm and 7pm in the Ballroom with accompanying wine reception. During the poster session, some presenters will be presenting in the virtual space at the same time as the live in-person poster session. All posters will also be available virtually on Gather from Monday 28th March at 9am. Any poster marked with an ^ on pp.11-13 will be presented in-person.

- [Link to the Gather Poster Room](#)

**Conference Dinner**

The conference dinner will be held on Thursday 31st March from 8pm in the Ballroom. For more details on how to book a place at the conference dinner, please see page 60.
START OF PARALLEL SESSIONS

Session A - The Ballroom / [Zoom Link to join Session A]

11.00 Joint 11th Frith Prize Lecture - [Zoom Link to join Session A]
Matthew Mak, University of York
Learning new words via reading: The influence of anchoring and contextual variation.

12:00 Tea / Coffee

12:30 Rory Baxter* and Alastair Smith (University of Plymouth) (Sponsor: Alastair Smith)
Differences in spatial memory across fully immersive and desktop virtual environments.

13:00 Harry Farmer, Eleanna Skoulikari*, Chris Bevan and Danae Stanton Fraser* (University
of Greenwich, University of Bath, University of Bristol) Effect of posture and identification on
VR as a Tool for Public Health Messaging.

13:30 Sara Spotorno*, Krystian Ciesielski* and Andrew Webb* (Keele University,
University of Glasgow) (Sponsor: Joseph Brooks) Automatic activation of functional and
taxonomic knowledge during processing of the real-world visual scenes.

14:00 Joseph Brooks, Kym Ellis* and Adam Coates* (Keele University, University of Graz,
Austria) Evidence for an intermediate mosaic stage in visual amodal completion revealed
by time-resolved multi-variate pattern analysis (MVPA) of EEG.

14:30 Tea / Coffee

15:00 Duncan Bradley*, Gabriel Strain*, Caroline Jay* and Andrew Stewart (School of
Biological Sciences, University of Manchester, School of Computer Science, University
of Manchester) (Sponsor: Andrew Stewart) The Influence of blank space and axis range
on perceived magnitude in data visualisations.

15:30 Kathryn Francis, Alice Regan*, Akhila Joseph*, Hadiah Aslam* and Marina-
Muradi* (Keele University) Do individual differences in vividness of mental imagery
and differences in the design of stimuli affect moral decision making? Withdrawn

16:00 Ralph Pawling and Freddie Turner* (Liverpool John Moores University) Facial
expression mimicry is modulated by facial trustworthiness.

16:30 Break

17:00 10th Frith Prize Lecture – The Ballroom / [Zoom Link to join Session A]
Jennifer Murphy, Royal Holloway, University of London
Interceptive ability: Measurement, conceptualisation and individual differences.

18.00 Poster Session – The Ballroom with accompanying wine reception.
[Link to the Gather Poster Room]
START OF PARALLEL SESSIONS

Session B - The Salvin Room / Zoom Link to join Session B

11.00 Joint 11th Frith Prize Lecture – The Ballroom / [Zoom Link to join Session A]
Matthew Mak, University of York
Learning new words via reading: The influence of anchoring and contextual variation.

12:00 Tea / Coffee

12:30 Sarah Etty*, David George, Elise Kleyn*, Shernaz Walton* and Henning Holle
(University of Hull, University of Manchester, Hull York Medical School) (Sponsor: Henning Holle) An attentional bias approach to understanding the psychosocial burden of psoriasis.


13:30 Alex Kafkas (University of Manchester) Expectation-modulated memory interacts with risk-taking behaviour and degree of state anxiety.

14:00 Stuart Moore* and James Grange (Keele University) (Sponsor: James Grange) Dimension switching impairs visual short-term memory resource allocation.

14:30 Tea / Coffee

15:00 Po-Heng Chen*, Kara Federmeier* and Chia-Lin Lee* (National Taiwan University, University of Illinois, United States of America) (Sponsor: Jennifer Rodd) Reprioritizing the weaker meaning enhances the post-N400 frontal positivity.

15:30 Claire Monroy*, Chen Yu* and Derek Houston* (Keele University, University of Texas at Austin, United States of America, Ohio State University, United States of America) (Sponsor: Joseph Brooks) Visual statistical learning in deaf and hearing infants and toddlers.

16:00 Agnieszka Konopka, Melissa Leppanen* and Kenna MacDonald* (University of Aberdeen) Listening to accented speech increases gist-based errors (false memories).

16:30 Break

17:00 10th Frith Prize Lecture – The Ballroom / [Zoom Link to join Session A]
Jennifer Murphy, Royal Holloway, University of London
Interoceptive ability: Measurement, conceptualisation and individual differences.

18.00 Poster Session – The Ballroom with accompanying wine reception.
Link to the Gather Poster Room
Session A

The Ballroom / Zoom Link to join Session A

09:00  Rebecca Norman*, Rachael Hulme, Christina Sarantopoulos*, Varsha Chandran*, Hantong Shen*, Jennifer Rodd, Holly Joseph and Joanne Taylor (University College London, Aston University, University of Reading) (Sponsor: Joanne Taylor) Contextual diversity during word learning through reading benefits generalisation of learned meanings to new contexts.


10:00  Alexandra-Iuliana Negoita*, Georgia Niolaki, Aris Terzopoulos, Janet Vousden* and Jackie Masterson* (Coventry University, Bath Spa University, Birmingham City University, Nottingham Trent University, Institute of Education, University College London) (Sponsor: Georgia Niolaki) The dyslexic jigsaw: Beyond reading, the role of self-compassion in adults with dyslexia.

10:30  Mahmoud Elsherif and Jonathan Catling (University of Birmingham) Age of acquisition effects on the decomposition of compound words.

11:00  Tea / Coffee

11:30  Joint 11th Frith Prize Lecture – The Ballroom / [Zoom Link to join Session A]
Moataz Assem, University of Cambridge
A domain-general cognitive core in the human brain.

12:30  Lunch
Session B

The Salvin Room / Zoom Link to join Session B

09:00 Joshua March*, Sheila Cunningham, Janet McLean*, Karen Golden* and Josephine Ross (Abertay University, University of Dundee) (Sponsor: Sheila Cunningham) The influence of self-referential cues and problem consistency on children's maths performance.


10:00 Silvia Seghezzi*, Elisabeth Parés-Pujolràs and Patrick Haggard (University College London, University College Dublin) (Sponsor: Patrick Haggard) Volition under uncertainty. Substitute Talk.

10:30 Heather Ferguson and Elisabeth Bradford (University of Kent, University of Dundee) A longitudinal study of visual perspective-taking across the lifespan.

11:00 Tea / Coffee

11:30 Joint 11th Frith Prize Lecture – The Ballroom / [Zoom Link to join Session A] Moataz Assem, University of Cambridge
A domain-general cognitive core in the human brain.

12:30 Lunch
**Session A**

The Ballroom / [Zoom Link to join Session A](#)

**Mid-Career Prize Symposium**
Learning the links between print, sound, and meaning in reading.
Organised by Jo Taylor and Jessie Ricketts

13:00 **Davide Crepaldi** (International School for Advanced Studies – SISSA, Italy) The connection between statistical learning and reading: how far does it go?

13:30 **Noam Siegelman** (Yale University, United States of America) Reading as statistical learning: Insights from studying individual differences in learning the regularities between orthography, phonology, and semantics.

14:00 **Laura Steacy** (Florida State University) Exploring child and word factors associated with how children learn to read in the quasi-regular English writing system.

14:30 Tea / Coffee

15:00 **Padraic Monaghan and Ya Ning Chang** (Lancaster University and University of Cambridge) Variation in the reading architecture: Computational modelling of oral language and reading development.

15:30 **Kathy Rastle** (Royal Holloway, University of London) Instruction and experience in the acquisition of linguistic knowledge.

16:00 **Jessie Ricketts and Jo Taylor** (Royal Holloway, University of London and University College London) How does reading promote high quality vocabulary knowledge?

16:30 Break

17:00 **20th Mid-Career Prize Lecture** – [Zoom Link to join Session A](#)
**Kate Nation, University of Oxford**
Becoming a reader.

End of Meeting

Conference Dinner
Thursday 31 March, pm

Session B

The Salvin Room / Zoom Link to join Session B

13:00  James Grange (Keele University) Control of stimulus-set and response-set in task switching.

13:30  Rachel Swainson, Laura Prosser and Motonori Yamaguchi (University of Aberdeen, University of Essex) What abolishes the preparation-driven subsequent task-switching cost on no-go trials?

14:00  Alex Baxendale* and Paloma Mari-Beffa (Bangor University) (Sponsor: Paloma Mari-Beffa) The role of verbalisations and anxiety in task switching.

14:30  Tea / Coffee

15:00  Zoe Hughes*, Jeannie Judge, Linden Ball and Cassandra Richardson* (University of Central Lancashire, University of Winchester) (Sponsor: Jeannie Judge) A meta-analytical review of the mindfulness-creativity link: Framing current lines of research and defining moderator variables.

15:30  Susan Sherman and Sarah Laurence* (Keele University, Open University) Own race bias for famous faces. Withdrawn

16:00  Victor Ajuwon*, Mark Walton*, Tiago Monteiro* and Alex Kacelnik (Department of Zoology, University of Oxford, Department of Experimental Psychology, University of Oxford) (Sponsor: Alex Kacelnik) Exploring non-instrumental information-seeking in goldfish.

16:30  Break

17:00  20th Mid-Career Prize Lecture - [Zoom Link to join Session A] Kate Nation, University of Oxford

Becoming a reader.

End of Meeting

Conference Dinner
The in-person poster session will be held in the Ballroom. 
Link to the Gather Poster Room

Any poster marked with an ^ will be presented in-person.


2. ^Lara Carr*, Federica Biotti, Dawn Watling and Rebecca Brewer (Royal Holloway, University of London) (Sponsor: Rebecca Brewer) The relationship between the processing of one's own and others' interoceptive states in adolescence, adulthood, and older age.

3. ^Richard O’Connor, Andrew Lucas and Kevin Riggs (University of Hull) No Evidence for Egocentric Bias on an Explicit False Belief Task in Adults: A Mouse Tracking Paradigm.


5. ^Harry Piper*, Paloma Mari-Beffa and Maria Manoli (Bangor University) (Sponsor: Paloma Mari-Beffa) Perceptual orientation and legitimacy of interpersonal cues to endangerment.

6. ^Astrid Emilie Lund*, Megan Lawrence and Charlotte Russell (King’s College London) (Sponsor: Charlotte Russell) How should we measure metacognitive judgements of episodic memory during ageing? Withdrawn

7. Mahmoud Elsherif, J. C. Catling, C. Pymont, R. A. Johnston, R. Clark and E. Kendall (University of Birmingham, Canberra University, Australia, University of Kent) Age of acquisition effects in recognition without identification tasks.

8. ^Ruolan Zhang* and Charlotte Russell (King's College London) (Sponsor: Charlotte Russell) The interaction between emotional content and contextual details in episodic memory.

9. ^Aisha Mukhtar* and Alex Kafkas (University of Manchester) (Sponsor: Alex Kafkas) The interdependence of emotional valence and expectedness in memory.

10. ^Shuangke Jiang*, Myles Jones and Claudia von Bastian (University of Sheffield) (Sponsor: Claudia von Bastian) TDCS effects on visual working memory over Dorsolateral prefrontal cortex and Posterior parietal cortex: A conceptual replication study of Wang et al. (2019).

11. ^Ruth Ogden, Chelsea Dobbins*, Kate Slade, Jason McIntyre* and Stephen Fairclough (Liverpool John Moores University, University of Queensland, Australia, Lancaster University) The psychophysiological mechanisms of real-world time experience.

13. Ralph Pawling and Hannah Taylor* (Liverpool John Moores University) Dilated and constricted pupils capture attention during different time intervals.

14. Adam Dede* and Elizabeth Milne (University of Sheffield) (Sponsor: Elizabeth Milne) Frustrative non-reward causes generalised inhibition that affects performance on attentional blink task.

15. Masi Noor*, Mauro Bertolotti*, Patrizia Catellani* and Iwan Dinnick* (Keele University) (Sponsor: Kathryn Francis) The effects of counterfactual thinking on unilateral forgiveness.

16. Lana Jago*, Padraic Monaghan, Kate Cain, Katie Alcock, Seamus Donnelly, Caroline Rowland, Rebecca Frost, Michelle Peter, Samantha Durrant and Amy Bidgood (Lancaster University, MPI Psycholinguistics Nijmegen, The Netherlands, Edge Hill University, Great Ormond Street Hospital, Manchester University, Salford University) (Sponsor: Padraic Monaghan) Grammar but not vocabulary learning at 17 months predicts language skills at 54 months.

17. Bradley Kennedy*, Annie Scudds*, Moira Lafferty* and Suzanne Stewart (University of Chester) (Sponsor: Suzanne Stewart) Exploring the components that influence the side-effect effect (AKA the knobe effect).

18. Paul Stott* (University of Manchester) (Sponsor: Andrew Stewart) VP-Internal subjects and incremental processing: Evidence from semantic priming during self-saced reading.


20. Silvia Seghezzi*, Stefan Bode, Stephen Fleming and Patrick Haggard (Institute of Cognitive Neuroscience, University College London, University of Melbourne, Australia, Department of Experimental Psychology, University College London, Max Planck University College London Centre for Computational Psychiatry and Ageing Research, Wellcome Centre for Human Neuroimaging, University College London) (Sponsor: Patrick Haggard) Research Plan - Neural coding of goals in voluntary action.

21. Mahsa Barzy, Rachel Morgan, Richard Cook and Katie Gray (University of Reading, Birkbeck, University of London) Attention to social interactions in real-world scenes: Evidence from change blindness.

22. Jo Cutler*, Jonas Nitschke*, Claus Lamm* and Patricia Lockwood (University of Birmingham, University of Oxford, University of Vienna, Austria, McGill University, Canada) (Sponsor: Patricia Lockwood) Older adults across the globe exhibit increased prosocial behaviour but also greater in-group preferences.

24. Sonia Malvica*, Letizia Palumbo and Valentina Cazzato (University of Messina, Italy, Liverpool Hope University, Liverpool John Moores University) (Sponsor: Valentina Cazzato) Do presence of people and perspective impact upon aesthetic and tourist judgements of tourist destination images?

25. Greg Maciejewski, Jack Taylor and Ekaterini Klepousniotou (University of the West of Scotland, University of Glasgow, University of Leeds, Carnegie Mellon University, United States of America) Type of polysemy matters: Evidence from semantic relatedness decisions. Withdrawn


27. Donna Gill*, Mengsi Wang, Jeannie Judge and Simon Liversedge (University of Central Lancashire, Tianjin Normal University, China) (Sponsor: Jeannie Judge) Return Sweeps during Chinese Multiline Reading: The Influence of Text Justification and Column Setting.

28. Ionela Bara*, Emily Cross and Richard Ramsey (Bangor University, University of Glasgow, Department of Cognitive Science, Macquarie University, Australia, Department of Psychology, Macquarie University, Australia) (Sponsor: Richard Ramsey) How does art knowledge training impact judgments of artworks?
**Joint 11th Frith Prize Lecture.**

Learning new words via reading: The influence of anchoring and contextual variation.

Matthew Mak  
University of York  
[matthew.mak@york.ac.uk](mailto:matthew.mak@york.ac.uk)

From mid-childhood onwards, the majority of new words are incidentally acquired via independent reading. Numerous studies have shown that the linguistic contexts in which a new word appears influence the ease with which the word is processed and acquired. Some contextual characteristics (e.g., high topic familiarity) are more beneficial to learning than others. The focus of my thesis was a relatively new contextual characteristic, known as semantic diversity, defined as the degree to which a word’s surrounding contexts overlap in terms of semantic content. The overarching aim of my thesis was to investigate how semantic diversity influences the learning of novel words in young adults. My thesis comprises a total of four word-learning experiments and three computational simulations. They all contrasted two learning conditions: high semantic diversity (multi-themed) and low semantic diversity (single-themed). This research demonstrated that initially restricting a novel word’s semantic diversity (i.e., starting small) and capitalizing on learners’ prior knowledge can support anchoring, which can facilitate subsequent learning in more diverse contexts.
Differences in spatial memory across fully immersive and desktop virtual environments.

Rory Baxter and Alastair Smith
University of Plymouth
rory.baxter@plymouth.ac.uk

The use of internal and external spatial cues to learn locations in the world around us is fundamental to our daily navigation behaviour. This behaviour is typically examined empirically using tasks in which participants learn the whereabouts of a hidden location using a combination of allocentric and egocentric cues, the availability and reliability of which can then be manipulated to identify their respective contributions to learning. These tasks often involve seated participants navigating a virtual environment displayed on a monitor. This medium contrasts with how we physically explore the real world as well as the experiments with rodents that inform influential theories of navigation. This talk presents a series of experiments that compare and contrast spatial memory on both desktop PC and fully motile immersive VR platforms. Participants were required to learn the location of a target object using either allocentric or egocentric information in isolation, or in combination. Performance was equivalent in the combined and egocentric conditions across desktop and immersive VR platforms, however, participants’ allocentric performance was stronger in the immersive VR version of the task. This difference between platforms suggests that some desktop-PC assays of navigation may not fully capture the behaviour.

Effect of Posture and Identification on VR as a Tool for Public Health Messaging.

Harry Farmer¹, Eleanna Skoulikari², Chris Bevan³ and Danae Stanton Fraser²

¹ University of Greenwich
² University of Bath
³ University of Bristol
h.farmer@gre.ac.uk

This experiment investigated the effect viewing the VR 360 documentary The Waiting Room (TWR) had on viewers’ sense of identity, mortality salience and health examination behaviour. TWR is filmed in an ambiguous style in which viewers are positioned close to, but not in the shoes of, the film’s subject and director, Victoria Mapplebeck, in a scene that recreates her radiotherapy treatment for breast cancer. We manipulated viewers’ posture to examine the effect on sense of identity with the documentary subject. Eighty female participants either sitting upright or reclining (matching the subjects posture) watched the documentary and the effect of posture was measured explicitly using questionnaires on presence, empathy, identity and health examination but also implicitly using a death thought awareness task. While no effect of posture was found Presence realism scores predicted greater identification with Victoria and people who had relatives with breast cancer were also more likely to identify with Victoria. Importantly those who identified with Victoria were more likely to indicate that they would carry out breast examination and showed reduced Death Thought Awareness. The implications of these results for using VR as a behaviour change tool are discussed.
Automatic activation of functional and taxonomic knowledge during processing of the real-world visual scenes.

Sara Spotorno¹, Krystian Ciesielski¹ and Andrew Webb²
¹ Keele University
² University of Glasgow
s.spotorno@keele.ac.uk

Although vision guides action, the role of functional (action-based) knowledge in understanding real-world scenes has been neglected. Research has focused on taxonomic knowledge, related to the scene’s context and the expected objects within it, and suggested that its activation is automatic during scene processing. We compared functional and taxonomic knowledge, examining automaticity and the time course of their activation when they are task irrelevant. In two lexical-decision experiments, the words were either consistent (naming a highly plausible action or object) or inconsistent (naming an implausible action or object) with the scene images. Experiment 1 used a picture-word interference paradigm, with the word superimposed on the scene image (0ms Stimulus-Onset Asynchrony). Experiment 2 used a priming paradigm, with the scene image presented as prime at 100ms, 200ms, 400ms, 800ms SOAs. Responses were faster for consistent than for inconsistent words, independently of the word type (action, object) and only at 0ms or 100ms SOA. These results show that knowledge activation about expected objects and actions is automatic and obligatory, but can subsequently be endogenously suppressed. They do not corroborate previous suggestions of primacy for functional understanding, indicating that predictions guiding visual scene processing similarly encompass all knowledge highly associated with the scene.

Evidence for an intermediate mosaic stage in visual amodal completion revealed by time-resolved multi-variate pattern analysis (MVPA) of EEG.

Joseph Brooks¹, Kym Ellis¹ and Adam Coates²
¹ Keele University
² University of Graz, Austria
j.l.brooks@keele.ac.uk

Behavioural and FMRI work has suggested the presence of an intermediate “mosaic” stage that precedes a fully completed (i.e., filled-in) representation during visual perception of partially occluded objects. However, due to poor temporal resolution of the methods, the relative timing of this proposed stage is unclear. Here, we use multi-variate pattern analysis (MVPA) of EEG data to address this issue with high temporal resolution. Participants observed three different stimuli: a partially occluded circle, a mosaic piece of a circle (i.e., the visible portion of a partially occluded circle), and a whole circle. Using a temporally-resolved cross-decoding (representational similarity) approach, we trained a classifier to distinguish mosaic (i.e., partial circle) from whole circles based on the EEG scalp pattern at each time point. We then used this classifier to decode partially-occluded trials. In line with a mosaic stage, partially-occluded trials were significantly more likely than chance to be predicted as mosaic shapes by the classifier during an intermediate period from approximately 200-400 ms. In contrast, later time periods were predicted as whole circles in line with a final amodally completed visual representation. Our results present direct, temporally-resolved evidence for a mosaic stage during amodal completion of visual objects.
Reprioritizing the Weaker Meaning Enhances the Post-N400 Frontal Positivity.

Po-Heng Chen¹, Kara Federmeier² and Chia-Lin Lee¹

¹ National Taiwan University  
² University of Illinois, United States of America  
bobby9104@gmail.com

Unexpected but plausible continuations of strongly constraining sentences elicit an anterior, post-N400 positivity (AP), and this effect has been linked to costs associated with revising erroneous predictions. We hypothesize that the AP may not be specific to sentence processing or disconfirmed predictions but instead reflect more general mechanisms needed to activate a weaker meaning representation in the face of competition. To test that, we measured event-related potentials as 32 young adults read biased homographs following a one-word context. The context word did not afford prediction but was semantically and syntactically consistent only with either the homograph’s dominant or subordinate meaning. We found a significant AP (650-850 ms) in the subordinate-biased condition relative to the dominant and unambiguous conditions. These results support our hypothesis that the AP previously seen to disconfirmed predictions can also be found in other cases wherein readers need to prioritize meaning information — here, in order to activate a homograph’s subordinate meaning in the face of competition from the dominant meaning (concurrently activated through strong form-meaning associations). We also found an association between the amplitude of the AP and print exposure, suggesting a role for long-term reading experience in recognizing the need for recruiting such processing resources.

Visual statistical learning in deaf and hearing infants and toddlers.

Claire Monroy¹, Chen Yu² and Derek Houston³

¹ Keele University  
² University of Texas at Austin, United States of America  
³ Ohio State University, United States of America  
c.d.monroy@keele.ac.uk

Congenital hearing loss offers a unique opportunity to examine the role of sound in cognitive, social, and linguistic development. Children with hearing loss demonstrate atypical performance across a range of general cognitive skills. For instance, research has shown that deaf school-age children underperform on visual statistical learning (VSL) tasks. However, the evidence for these deficits has been challenged, with mixed findings emerging in recent years. Here, we used mobile eye-tracking to examine VSL in the action domain early in development. We compared learning between deaf and hearing infants, prior to cochlear implantation (pre-CI), and between deaf and hearing toddler’s post-implantation (post-CI). Findings revealed a significant difference between deaf and hearing infants pre-CI, with evidence for learning only in the hearing infants. However, there were no significant group differences between deaf and hearing toddlers post-CI, with both groups demonstrating learning. Further, VSL performance was positively correlated with language scores for the deaf toddlers, adding to the body of evidence suggesting that statistical learning is associated with language abilities. I will discuss these findings in the context of previous evidence for group differences in VSL skills, and the role that auditory experiences play in infant cognitive development.
Listening to accented speech increases gist-based errors (false memories).

Agnieszka Konopka, Melissa Leppanen and Kenna MacDonald
University of Aberdeen
agnieszka.konopka@abdn.ac.uk

Previous DRM studies [1] showed lower false memory rates for words spoken in a non-native (L2) than native (L1) accent (but see [2]). This effect was attributed to greater expenditure of effort during encoding of (even highly comprehensible) L2 speech, resulting in reduced semantic activation and thereby lower rates of gist-based errors. The current study compared false memory rates for information presented with L1 and L2 accents using ecologically valid materials. L1 participants studied pictures of every-day events presented with recorded sentences (e.g., ‘The dog chased the postman’) produced by (a) an L1 speaker, (b) an L2 speaker with a weak foreign accent, or (c) an L2 speaker with a strong foreign accent, and then performed a recognition test. Analyses compared responses to studied sentences (hits) and to new sentences expressing unstudied pragmatic inferences (false alarms; ‘The dog bit the postman’). Despite high comprehensibility of all recordings, memory performance was modulated by the nativeness of the input and not accent strength: false alarm rates were higher after listening to weakly-accented and strongly-accented L2 speech than to L1 speech. The results are more compatible with accounts postulating reduced attention and/or processing effort when listening to foreign-accented speech.

An Attentional Bias Approach to Understanding the Psychosocial Burden of Psoriasis.

Sarah Etty¹, David George¹, Elise Kleyn², Shernaz Walton³ and Henning Holle¹
¹ University of Hull
² University of Manchester
³ Hull York Medical School
s.etty-2018@hull.ac.uk

People with psoriasis often find themselves trapped in a mutually reinforcing cycle of social rejection triggered by the visible consequences of the disease, avoidance coping, and social isolation. The current research investigated whether people with psoriasis display an attentional bias towards disease-specific information. 100 participants with a self-reported diagnosis of plaque psoriasis and 100 healthy control participants completed 2 different reaction time tasks to evaluate attentional processing of disease-related threat stimuli compared to neutral stimuli. The first was an emotional spatial cueing task, which did not detect any attentional biases for threatening information in either lexical or pictorial format, or at short (200ms) or long (1000ms) presentation times. The second was an emotional Stroop task, which showed that threat words elicited significantly longer reaction times than neutral words in the psoriasis group, but not in the control group. These results show that the presence of threat words can induce an attentional bias in those with psoriasis, but that this is not strong enough to be detected by the emotional spatial cueing task. This may suggest that the emotional Stroop task has greater sensitivity in detecting attentional bias in psoriasis populations.

Autonoetic Consciousness: a novel method of capturing the subjective experience of memory recall and future thinking.

Andreea Zaman, Caroline Catmur and Charlotte Russell
King's College London
andreea.zaman@kcl.ac.uk

Autonoetic Consciousness (AC) allows us to represent our ‘self’ during mental time travel and to re-experience past events and pre-experience our future (8). There has been much variability in the measurement of AC, with researchers using various methods to tap into this higher-order process (9). We developed a new methodology to capture AC during memory recall and future thinking by a) comprehensively compiling all the previously used questions and scales to measure AC (1, 2, 3, 4, 6, 8) together with new items of event meaning and effort and b) using natural language processing. In Study 1, after piloting, 202 neurotypicals (age 18–35) narrated autobiographical childhood & recent memories and near & far future events online. After each event, they completed our novel AC questionnaire (ACQ) to identify and quantify their experience when remembering and imagining these events (e.g., How vivid was the event you remembered/imagined?). Factor analysis revealed informative differences between the type of event re or pre-experienced. For example, the vividness item emerged when imagining future events but not when remembering past events. Using Natural Language Processing, we could demonstrate that the language participants use to describe the past and future events correlates with ACQ scores. In Study 2, 123 participants encoded a video event of a day out in London. We were able to link AC with objective memory performance, at recall, only in the group of participants informed this was their own event– as opposed to the other group who were told it was someone else’s event. As the subjective sense of recall is impaired in clinical groups and healthy ageing (3, 5, 7), our novel measure is of potentially broad interest to accompany memory questionnaires to tap into autonoetic consciousness.

# Expectation-modulated memory interacts with risk-taking behaviour and degree of state anxiety.

Alex Kafkas
University of Manchester
alexandros.kafkas@manchester.ac.uk

Expected or unexpected stimuli trigger different encoding mechanisms as reflected on subsequent memory. We have previously shown that unexpected events are more likely to be retrieved based on recollection, whereas memory for expected ones relies more on familiarity. In the present study, we sought to investigate whether memory bias for expected versus unexpected stimuli is modulated by anxiety and risk-taking behaviour. In a rule-learning task, participants learned contingency relationships between 6 different symbols and the type of stimulus that followed each one. At encoding, the established relationship was violated for a subset resulting in the presentation of both expected and unexpected stimuli. Participants’ memory for these events was tested later in a recognition memory task and their state/trait anxiety and risk-taking behaviour were also recorded. We replicated the finding that expectation has opposite effects on familiarity and recollection. Furthermore, unlike trait anxiety, high state anxiety was associated with greater memory for unexpected stimuli. Importantly, risk-taking behaviour significantly interacted with expectation-modulated memory, showing that expectation by memory interaction was only present for the low-but not high-risk taking individuals. The findings show that personality characteristics interact with encoding mechanisms and the prioritisation of information in memory.
Dimension switching impairs visual short-term memory resource allocation.

Stuart Moore and James Grange
Keele University
s.b.moore@keele.ac.uk

A prominent account of visual short-term memory (vSTM) holds that a memory resource is shared among all items in the immediate visual environment with no upper limit to the number of items which can be stored in memory (Bays et al., 2009). Rather, when a greater number of items are present, fewer resources are allocated to each item resulting in less precise memory representations. To investigate the role of attention in allocation of this resource, the present study made use of a continuous report task embedded within a task switching paradigm, wherein four coloured, oriented circular shapes were presented. A cue at the beginning of each trial indicated which feature was relevant, and the relevant feature could either repeat or switch from the previous trial. Participants reproduced either the colour or orientation of the probed stimulus via a 360° wheel presented on screen. Analysis of parameters obtained from mixture modelling (Bays et al., 2009) showed that while switching between feature dimensions had little impact on memory precision and probability of guessing, dimension switching significantly increased the probability of responding to a non-target. These results suggest that switching between feature dimensions leads to increased mis-binding of feature values.


The Influence of blank space and axis range on perceived magnitude in data visualisations.

Duncan Bradley¹, Gabriel Strain², Caroline Jay² and Andrew Stewart¹,²
¹ School of Biological Sciences, University of Manchester
² School of Computer Science, University of Manchester
duncan.bradley@postgrad.manchester.ac.uk

When visualising data, there are many ways to display the same value, and design choices can elicit different interpretations of the same information. Extending a graph’s axis limits beyond the range of the plotted data introduces substantial blank space into a graph. In three experiments, we demonstrate that the presence of blank space influences judgements of the magnitude of plotted data points. Participants viewed data visualisations displaying the probability of negative outcomes occurring in scenarios involving risk (e.g., the probability of experiencing side effects from medication). In Experiment 1, magnitude was rated higher when data points were positioned near the top of a graph than when the same data points were positioned near the bottom. In Experiments 2 and 3, we demonstrate that this is not due to a simple association between higher physical positions and greater magnitudes, but through contrast with other plausible values. Regardless of their physical positions, data points were associated with greater magnitudes when they were numerically greater than the plausible values represented by blank space. Magnitude is judged by appraising data in the wider context provided by a graph, with blank space used as a reference point for comparison.
Moral judgments are often studied using sacrificial moral dilemmas that involve considering whether sacrificing one person to save many more is a morally acceptable thing to do. Traditionally, these moral dilemmas are presented as text-based vignettes. In several studies, we incorporated Virtual Reality (VR) simulations of sacrificial moral dilemmas and found that utilitarian decision-making (sacrificing one person to save more) is higher in VR compared to text dilemmas (Francis et al., 2016; 2017; 2018). Subsequently, we are now investigating how mode of presentation may affect responses to moral dilemmas given these findings. Across several studies, we find that moral responses in text-based dilemmas do not differ to decisions made in simple visual dilemmas or 2D video dilemmas that include sound (Francis, Beaman, Stone, & Kneer, in prep). We present the results of a new pre-registered study which extends these prior studies by incorporating a measure of vividness of mental imagery to determine whether individual differences in visual imagination influence moral decision-making. We also directly manipulate focus in moral dilemmas by using text descriptions, visual information, and auditory cues to draw attention to different victim groups (one individual versus many individuals). In this study, we find an effect of mode of presentation on moral decision-making, but we do not find an effect of vividness of mental imagery or focus on moral decision-making. These findings are discussed in light of previous findings and existing models of moral judgment.

Facial expression mimicry is modulated by facial trustworthiness.

Ralph Pawling and Freddie Turner
Liverpool John Moores University
r.pawling@ljmu.ac.uk

Facial mimicry describes the tendency of humans to rapidly mirror the emotional facial expressions of other people with whom they are interacting. At first thought to be a form of motor resonance, facial mimicry is now believed to be driven by social imperatives that lead to the sharing of emotional or social states. In line with this perspective, the extent to which we mimic other people’s emotional expressions has been shown to be affected by social factors, such as competition, in-group status and reputation. In the current study we set out to test whether facial mimicry might also be modulated by social information provided by the face itself - specifically, perceptions of trustworthiness conveyed by facial appearance. Participants viewed faces previously rated as high or low in facial trustworthiness, which smiled or frowned. The participant’s own facial reactions were measured using electromyography. In line with social accounts of facial mimicry we found that our participant’s facial reactions differed depending on the facial trustworthiness of the avatar, with low facial mimicry reduced to low trust avatars. This effect occurred regardless of whether the trustworthiness of the avatars was task-relevant for the participants or not.

10th Frith Prize Lecture.

Interoceptive ability: Measurement, conceptualisation and individual differences.

Jennifer Murphy
Royal Holloway, University of London
jennifer.murphy@rhul.ac.uk

Interoception is described as the perception of the internal state of one’s body and includes sensations such as cardiac or respiratory signals. Despite great interest in interoception, there remains uncertainty regarding the measurement, conceptualization and developmental trajectory of interoception, as well as its relationship with health and higher order cognition. This talk will provide an overview of work that has examined links between interoception and emotional ability, highlighted problems with the measurement of interoception, and provided novel insights into the structure of interoceptive abilities. The latter part of the talk will focus on recent work that has further scrutinised the measurement of interoception, sought to develop solutions to the challenges of interoception measurement, and has examined demographic factors related to individual differences. Together these findings suggest that interoception is a multifaceted construct with relevance for health and cognition, though further work is required to adequately measure individual differences in interoceptive ability.
Contextual diversity during word learning through reading benefits generalisation of learned meanings to new contexts.

Rebecca Norman¹, Rachael Hulme², Christina Sarantopoulos¹, Varsha Chandran¹, Hantong Shen¹, Jennifer Rodd¹, Holly Joseph³ and Joanne Taylor¹

¹ University College London
² Aston University
³ University of Reading
Rebecca.Norman.19@ucl.ac.uk

From mid-childhood, most new words are learned through reading. The precise meaning of words depends upon their linguistic context, which readers use to infer the appropriate interpretation. The ‘Lexical Legacy Hypothesis’ [1] predicts that contextually diverse environments promote development of flexible meaning representations, allowing readers to generalise words to new contexts. This study investigated whether contextual diversity benefits word-form and meaning learning in adults (n = 241) using a word learning paradigm. Participants learned meanings for 8 pseudowords through reading 10 sentences about each. Four pseudowords were learned in a diverse condition (different topics) and four in a non-diverse condition (same topic). An old-new decision post-test indicated that diversity did not influence word form learning. In a second post-test, participants chose which pseudoword completed a sentence from either a new, unseen context, or familiar, trained context. For familiar contexts, accuracy was higher for words learned in the non-diverse condition, but for unfamiliar contexts, accuracy was higher for words learned in the diverse condition. Results suggest that diverse contexts may promote development of flexible, decontextualised meaning representations which are easier to generalise to new contexts. Conversely, non-diverse contexts may favour extraction of context-bound representations which are easily used in the same context.

Nation, K., Nurturing a lexical legacy: reading experience is critical for the development of word reading skill. npj Science of Learning, 2017. 2(1): p. 3.

Effect of swearing on strength: State disinhibition as a potential mediator.

Richard Stephens, Harry Dowber, Amber Barrie, Sannida Almeida and Katie Atkins
Keele University
r.stephens@keele.ac.uk

Swearing fulfils positive functions including benefitting pain relief and physical strength. Here we present two repeated measures experiments (Exp 1, N=56; Exp 2, N=118) on swearing and strength assessing the psychological mechanism state disinhibition. Both included measures of physical performance, respectively, grip and arm strength, and both included the Balloon Analogue Risk Task (BART) to measure risky behaviour. The pre-registered Experiment 2 additionally assessed flow, emotion including humour, distraction including novelty, self-confidence and anxiety. Both experiments found repeating a swear word benefitted physical strength and increased risky behaviour, but risky behaviour did not mediate the strength effect. Experiment 2 found repeating a swear word increased flow, positive emotion, humour, distraction and self-confidence. Humour mediated the effect of swearing on physical strength, consistent with a hot cognitions explanation of swearing-induced state disinhibition. However, as this mediation effect was part of an exploratory analysis, further pre-registered experimental research including validated measures of humour is required.
The dyslexic jigsaw; Beyond reading, the role of self-compassion in adults with dyslexia.

Alexandra-Iuliana Negoita¹, Georgia Niolaki²,⁵, Aris Terzopoulos³, Janet Vousden⁴ and Jackie Masterson⁵
¹ Coventry University
² Bath Spa University
³ Birmingham City University
⁴ Nottingham Trent University
⁵ Institute of Education, University College London
ad5686@coventry.ac.uk

The emotional aspect of dyslexia is recently receiving more attention. There is a growing body of literature that highlights the links between dyslexia and self-perception (such as self-esteem and self-efficacy) and psychopathology (such as anxiety). The study investigated the role of self-compassion in relation to self-esteem and self-efficacy and anxiety in 100 adults with a diagnosis of dyslexia. Specifically, we explored if facets of self-compassion have distinct roles within these relationships. We also aimed to identify whether self-compassion mediates the well reported association of self-esteem and self-efficacy with anxiety. The participants completed an online survey measuring aspects of the self (compassion, esteem, and efficacy) and anxiety. Self-compassion was found to be related to all the measures and mediated the impact of low self-esteem and self-efficacy on anxiety, which has not been reported before. Our findings suggest that individuals with dyslexic difficulties experience less negative emotional outcomes as they act more self-compassionately. Implications of the findings are discussed in relation to past research.

Age of acquisition effects on the decomposition of compound words.

Mahmoud Elsherif and Jonathan Catling
University of Birmingham
mahmoud.medhat.elsherif@gmail.com

Age of acquisition (AoA) is a measure of learning experience and a strong predictor of lexical retrieval. The integrated account predicts that the AoA effect should be shown in the early processes of word recognition and the AoA effect should increase in tasks requiring greater semantic processing. The present study investigates the integrated account in compound words, which differ from monomorphemic words regarding ease of mapping and semantic processes in lexical retrieval. Forty-eight participants completed a compound lexeme segmentation (CLS) task, in which participants named either the head or modifier depending on the number above the compound word, to establish how semantics are involved in processing the head and the modifier. The results demonstrated that semantics influenced the naming of the modifier to a greater extent than the head, with the AoA effect being larger in the modifier than the head. This indicates that the AoA effect has multiple origins.

Joshua March¹, Sheila Cunningham¹, Janet McLean¹, Karen Golden¹ and Josephine Ross²

¹ Abertay University
² University of Dundee
j.march@abertay.ac.uk

We investigated the influence of self-referencing pronouns (i.e. “You”) on children’s performance on maths problems. Previous work suggests that children are faster and more accurate on questions including such cues (d’Ailly, Simpson & MacKinnon, 1997). One explanation could be reduced working memory load – self-referential information is easy to recall, thus freeing up memory resources. However, de Koning and van der Schoot (2019) did not replicate these effects, but instead found that problem consistency (i.e. whether additions include the term ‘more’ and subtractions include ‘less’) impacts performance. To investigate whether self-referencing impacts maths performance, we recruited 144 children aged between 9 and 11 years. The questions were word problems, e.g. “You have 3 lemons and John has 5 lemons. How many lemons are there altogether?”. We manipulated the operation (addition vs subtraction), self-referencing pronoun presence (“You” vs “Jim/Lucy”) and problem consistency (consistent vs inconsistent). We found significant effects of pronoun and consistency: children were faster (p < .001) and more accurate (p < .001) on questions that included self-referencing pronouns. They were also faster (p < .001) and more accurate (p < .001) on consistent questions than inconsistent questions. Our findings suggest that self-referencing cues can potentially benefit children’s maths performance.

The Interview Task: Novel Theory of Mind Task Demonstrates Representation of Minds in Mental State Inference.

Emily Long¹, Helio Cuve¹, Jane Conway², Caroline Catmur³ and Geoffrey Bird¹

¹ University of Oxford
² Institute for Advanced Study in Toulouse, France
³ King’s College London
emily.long@psy.ox.ac.uk

Theory of mind (ToM), the ability to represent the mental states of oneself and others, is argued to be central to human social experience, and impairments in this ability are thought to underlie several psychiatric and developmental conditions. Two ways in which individual differences in ToM might manifest are in the propensity to engage in mental state inference; and the accuracy of those inferences. To examine the accuracy of mental state inferences, a novel ToM task was developed, requiring inferences to be made about the mental states of ‘Targets’ during a videoed interview scenario. These inferences were compared to ground truth data provided by the Targets. Participants also made estimates of the ‘Targets’ personality traits. Results demonstrated that trait inferences were used to derive mental state inferences, and that the accuracy of trait estimates predicted the accuracy of mental state inferences. Moreover, relationships between trait and mental state inference varied as a function of the specific mental state inference being made and its relationship to specific traits. Findings are in accordance with the Mind-space theory, that representation of the Target mind is used in the inference of their mental states.
Volition under uncertainty. Substitute Talk

Silvia Seghezzi¹, Elisabeth Parés-Pujolràs² and Patrick Haggard¹
¹ University College London
² University College Dublin
s.seghezzi@ucl.ac.uk

Voluntary actions are guided by a combination of exogenous cues, e.g., external stimuli, and endogenous factors, e.g., prior beliefs and “intentions”. Importantly, both factors can carry a degree of uncertainty. Here we used a reinforcement learning paradigm in which participants learned the optimal time to act. Endogenous uncertainty about when to act progressively decreased as participants learned. Exogenous uncertainty was modulated by changing the reliability of reinforcing feedback. We measured the EEG Readiness Potential (RP) before each action as a marker of volition, and the intentional binding effect (IB, subjective time elapsed between action and a subsequent outcome) as a measure of sense of agency. We showed that the RP increased with learning, particularly for more reliable, less uncertain feedback. In contrast, the IB effect decreased with learning, particularly when the feedback was more uncertain, and thus less effective in guiding the behaviour. It follows that if RP is taken as a marker of voluntary motor generation, then volition appears to strengthen as uncertainty (both endogenous and exogenous) decreases. Conversely, if IB is taken as a marker of the subjective linkage between action and outcome (i.e., sense of agency), this linkage weakens as actions become overlearned.

A longitudinal study of visual perspective-taking across the lifespan.

Heather Ferguson¹ and Elisabeth Bradford²
¹ University of Kent
² University of Dundee
h.ferguson@kent.ac.uk

Successful social interactions depend on our ability to take other people’s perspectives. Even though adults can rapidly and accurately compute their own and other people’s perspectives, they still experience difficulties when another person’s viewpoint conflicts with their own. This study explored the longitudinal associations between visual perspective-taking abilities and executive functions across the lifespan. Participants (aged 10-89 years old; N=320) completed two visual perspective-taking tasks (measuring level 1 and level 2 processing) alongside four executive function tasks (measuring inhibition, working memory, set-shifting and planning), at two time points (~2.5 years apart). We examined how individual differences in each of the sub-components of executive functioning influences the degree to which interference is experienced from the irrelevant perspective when perspectives are in conflict (i.e., egocentric and altercentric interference). Multiple mediation models showed that at time 1, working memory predicted increased egocentric interference, but none of the executive functions predicted altercentric interference. Longitudinal associations between visual perspective-taking and components of executive function were examined using cross-lagged mediation models, and revealed a predictive role for working memory and inhibition in managing egocentric interference, but again no link between executive functions and altercentric interference.
Joint 11th Frith Prize Lecture.

A domain-general cognitive core in the human brain.

Moataz Assem
University of Cambridge
Moataz.Assem@mrc-cbu.cam.ac.uk

I will present new results on the functional organization of association cortices giving mechanistic insights into how complex cognition is organized. The multimodal Magnetic Resonance Imaging methods of the Human Connectome Project allowed the delineation of nine cortical patches per hemisphere that are co-activated across a diverse range of cognitive demands. Within these domain-general or multiple demand (MD) patches, a circumscribed set of core MD regions stood out as the most strongly activated and functionally interconnected. MD properties extended to specific subcortical and cerebellar structures, suggesting a brain wide system in control. Resolving a decades old debate on their functional specificity, MD regions showed relative functional specializations that shift following a fine-grained anatomical architecture. Specifically, each task demand displays a unique intersection between MD network and adjacent, more specialised networks. In this intersection, the strongest activity arises at network borders, where information may be most intensively exchanged. These results bring a new level of precision to understanding how cognition is assembled in the brain.
Mid-Career Prize Symposium

**Learning the links between print, sound, and meaning in reading.**
Organised by Jo Taylor and Jessie Ricketts.

### The connection between statistical learning and reading: how far does it go?

**Davide Crepaldi**  
SISSA, Trieste, Italy  
dcrepaldi@sissa.it

Multiple sources of evidence support the idea that reading and visual word identification build upon statistical regularities in the (written) language. However, statistical learning is surely not a language-specific engine, and seems to be deeply embedded into the visual system. This begs the question: how special is letter and word processing, really? In this talk, I'll try to define the connection between statistical learning and reading at the boundary between language and perception, with a particular focus on the consequences of this interplay for literacy acquisition.

### Reading as statistical learning: Insights from studying individual differences in learning the regularities between orthography, phonology, and semantics.

**Noam Siegelman**  
Yale University, United States of America  
noam.siegelman@yale.edu

Statistical views of reading highlight the impact of the quasi-regular nature of the mappings between print, sound, and meaning on reading processes. Advances in statistical learning research also suggest, however, that not all individuals are similarly adept at learning such a rich array of information from sensory input. In this talk, I will present a series of studies that examine how individual differences in sensitivity to different types of regularities during reading are associated with reading skills among early readers of English. I will start from work that investigates children's reliance on orthographic-phonological (O-P) versus semantic imageability during reading aloud, and the relation between variability along these two dimensions, concurrent reading skills, and response to intervention for children with reading disabilities. Then, I will present studies that explore additional important regularities, focusing on individual differences in reliance on orthographic-semantic (O-S) associations and context-dependent O-P regularities. Overall, results suggest that better literacy skills are associated with efficient utilization of the writing system's structure, with increased reliance on (increasingly more subtle) O-P and O-S regularities and lesser reliance on arbitrary cues. I will discuss the implications of these findings for statistical views of reading and statistical learning theory more broadly.
Exploring child and word factors associated with how children learn to read in the quasi-regular English writing system.

Laura Steacy
Florida State University, United States of America
lsteacy@fcrr.org

In English many graphemes, particularly vowels, can be pronounced in multiple ways (e.g., pint vs hint, bead vs head). This ambiguity in the English orthographic-phonological mapping system poses significant challenges to beginning readers. In this study, we explored vowel pronunciations in real words and nonwords containing variable vowels (e.g., zead). We provided short-term exposures to different mixes of words supporting particular vowel pronunciations (e.g., bead vs. dead) in children in grades 2-5 (N=485) randomly assigned to read 1 of 4 corpora supporting high vs. low frequency vowel pronunciations (bead vs. dead). We used explanatory item response models to explore: (1) the effect of condition on item-level performance at the last word exposure, (2) the effect of condition on item-level performance on nonwords containing the ambiguous vowels at post-exposure, (3) the effect of pre-exposure item performance on the probability of producing a high vs. low frequency pronunciation post-exposure, and (4) the interaction between pre-exposure item performance and condition on the probability of producing a high vs. low frequency pronunciation post-exposure. Results suggest that “vowel tuning” can occur based on short-term exposure; however, the effect is much stronger when supporting the high frequency vowel pronunciation in children who have plausible existing pronunciations.

Variation in the reading architecture: Computational modelling of oral language and reading development.

Padraic Monaghan and Ya Ning Chang
Lancaster University and University of Cambridge
p.monaghan@lancaster.ac.uk

Learning to read requires transforming written to spoken and meaning forms of words, but such learning piggy-backs on several years of pre-literacy experience of oral language. Variation in that pre-literacy experience has a profound effect on learning to read, and whether we learn words prior to or post-literacy also has a critical effect on how those words are then represented in our minds. In a series of computational models simulating reading development, we investigated the role of oral language variation on the architecture of the reading system. These models predict that diversity as well as quantity of experience have distinct implications for learning to read. The models also predict that different reading training programmes are needed for children with poorer or stronger oral language abilities. Further, the models demonstrated that words learned before versus after literacy onset make different use of oral language skills, and the models also predict that oral language skills have very different outcomes for children learning to read alphabetic versus logographic writing systems. Computational modelling enables us to fill in the missing link between theory and behaviour, and demonstrate why preschool language abilities are so crucial for children’s educational development.
Instruction and experience in the acquisition of linguistic knowledge.

Kathy Rastle
Royal Holloway University of London
kathy.rastle@rhul.ac.uk

Acquiring understanding of regular patterns in the writing system is a vital part of learning to read. Emerging consensus views this as a statistical learning problem in which readers discover these patterns through text experience; for example, knowledge of the meaning of [-er] might be gained from experience with dealer, teacher, builder. My talk draws on computational modelling and behavioural work to raise questions about this perspective. I argue that there are limits to statistical learning in complex writing systems, and that there is a need to achieve deeper understanding of how these learning processes work together with direct instruction to support generalisation.

How does reading promote high quality vocabulary knowledge?

Jessie Ricketts and Jo Taylor
Royal Holloway, University of London and University College London
jessie.ricketts@rhul.ac.uk and joanne.taylor@ucl.ac.uk

Knowing the meanings of words is fundamental to all areas of education and disadvantages in vocabulary knowledge are a major barrier to academic achievement. Pinker characterised reading as an “optional accessory that must be painstakingly bolted on” to an innate system for spoken language. However, from mid-childhood, most new words are learned through reading, making it anything but optional. The work presented in this talk examines how learning words through reading can lead to high-quality lexical representations. Jessie Ricketts will present studies in which children are given the opportunity to read texts and books that contain novel words. Findings show that children can learn new words incidentally while reading but that learning is influenced by pre-existing reading skills and language knowledge, and the nature of exposure (e.g. type of context, quantity of exposures). These findings indicate how to maximise incidental word learning through reading. Jo Taylor will present studies with adults that test how variations in how easy it is to infer word pronunciations and meanings affect participant’s subsequent ability to spell and define the newly learned words. Results have implications for how to optimise educational environments both for first and second language learners.

End of Symposium
Control of stimulus-set and response-set in task switching.

James Grange  
Keele University  
j.a.grange@keele.ac.uk

Stimuli in our environment afford multiple actions: Sat at a computer, for example, there are many actions that could be performed. Goal-directed behaviour requires selection of the mental representation related to the goal in the face of competing representations. However, successful goal-directed behaviour doesn’t just require selecting the correct action; we must also select the correct stimulus within our environment to act upon, something task-switching paradigms often overlook. Classical theories of attention differentiate between two mental-sets required in such multi-task situations: Response-set refers to the representation of potential responses to a given stimulus, and stimulus-set refers to the representation used for the selection of the stimulus itself. I present a new paradigm presenting participants with multiple multivalent stimuli. Participants are cued as to the relevant stimulus-set (what to attend to) and response-set (how to respond to it), which independently either repeated or switched from the previous trial. The results showed large switch-costs for both response-set and stimulus-set switches, which were under-additive suggesting the updating of response-set and stimulus-set control parameters occurs in parallel. This conclusion was supported by the adaption of a computational model of dual-task control (ECTVA; Logan Gordon, 2001), which reproduced the behavioural results well.


What abolishes the preparation-driven subsequent task-switching cost on no-go trials?

Rachel Swainson¹, Laura Prosser¹ and Motonori Yamaguchi²  
¹ University of Aberdeen  
² University of Essex  
r.swainson@abdn.ac.uk

How do no-go trials abolish the subsequent task-switching cost established by task preparation? A double-registration design was used to address this question. In this cued task-switching procedure, responses are required to both task-cue and target stimuli. We report two experiments involving three types of ‘no-go’ trial: end-of-preparation-signal trials presented a blank screen instead of a target; response-mapped no-go trials presented a white cross (X) over a target; and simple no-go trials presented a white cross without a target. There were also cue-only trials, which ended immediately after cue response. Experiment 1 included end-of-preparation-signal, response-mapped no-go, and cue-only trials; Experiment 2 included end-of-preparation-signal, response-mapped no-go, and simple no-go trials. In Experiment 1, task-switching costs were eliminated following response-mapped no-go trials. The costs remained significant following end-of-preparation-signal trials but were reduced compared with those following cue-only trials (also significant). Surprisingly, in Experiment 2, task-switching costs remained significant following both response-mapped and simple no-go trials, and were no smaller than those following end-of-preparation-signal trials. These results show that different ways of signalling ‘no-go’ can reduce the subsequent task-switching cost to different extents, but that the extent of the reduction for any particular trial type might depend upon which other trial types are included.
The role of verbalisations and anxiety in task switching.

Alex Baxendale and Paloma Mari-Beffa
Bangor University
lxb18dyx@bangor.ac.uk

It has been suggested that being anxious can occupy verbal working memory, a type of memory required for goal activation in cognitively intensive tasks. Likewise, during these tasks it has been found that boosting task related verbal working memory have been found to improve performance, e.g., listening to or reading aloud instructions (Kirkham et al., 2012). This experiment seeks to replicate the previous work whilst accounting for trait anxiety. We used a task-switching alternating runs paradigm where auditory and visual instructions appeared simultaneously. Participants had to follow either the auditory or visual cue in separate blocks, whilst ignoring the counterpart. The distractor cue could be congruent or incongruent with the target rule. Results showed that low anxious individuals greatly benefit from auditory cues, whilst high anxious individuals saw no differences. The data suggests that the verbal working memory used for cognitive control is based more in phonological grounding, and that anxious individuals do not benefit from hearing task instructions as they are already engaged in phonological ruminations.

A Meta-Analytical Review of the Mindfulness-Creativity Link: Framing Current Lines of Research and Defining Moderator Variables.

Zoe Hughes¹, Jeannie Judge¹, Linden Ball¹ and Cassandra Richardson²
¹ University of Central Lancashire
² University of Winchester
ZDHughes@uclan.ac.uk

Practicing mindfulness has been linked with a myriad of outcomes across multiple psychological domains, including creativity. However, findings relating to the impact of mindfulness interventions on creative performance remain inconsistent, perhaps because of discrepancies between study methodologies. To derive a clearer understanding, two meta-analytical reviews were conducted, drawing respectively on studies using a control group designs (n = 20) and studies using a pre-test - post-test designs (n = 17). A positive effect was identified between mindfulness and creativity, both for control group designs (d = 0.42) and pre-test - post-test designs (d = 0.59), whilst subgroup analysis revealed that intervention length and type of control group (active vs. waiting-list vs. no-treatment) significantly moderated the relationship. Findings also lend support to the claim that mindfulness impacts divergent and convergent thinking differently. Taken together, the results support the view that mindfulness is effective at improving creative performance, thereby resolving discrepant findings in the literature. We discuss the results in relation to the theoretical underpinnings of divergent and convergent thinking so as to provide an explanatory account of the beneficial impact of mindfulness practice on creative performance.
Own race bias for famous faces. Withdrawn

Susan Sherman¹ and Sarah Laurence²
¹ Keele University
² Open University
s.m.sherman@keele.ac.uk

People tend to be worse at recognising other-race faces than own-race faces, known as “own-race bias” (ORB) (Meissner & Brigham, 2001). Most previous research examining ORB has focused on unfamiliar face recognition, however, much less is known about, and the evidence is mixed for ORB in familiar face recognition (eg Butcher et al, 2017, Zhou & Mondloch, 2016). We examined ORB using celebrity faces in 2 experiments using Deese (1959)/Roediger–McDermott (1995) (DRM)-style learning lists. Participants were presented with 8 sets of 10 associated celebrity photographs (e.g. black female actors: Viola Davis, Regina King, Lupita Nyong'o, Kerry Washington, etc.). We then measured how often participants correctly identified new photographs of presented celebrities and falsely identified new photographs of related non-presented lure celebrities (e.g. Halle Berry) either immediately after study (exp1) or a week later (exp2). We found ORB in white participants in both experiments with more hits for white faces and more false identification of black lures and filler items. Comparing results from exp1&2, correct recognition was stable across time (65% vs 64%) while lures increased (18% to 63%). Taken together, these results have implications for the criminal justice system and for current theories of face recognition and ORB.

Exploring non-instrumental information-seeking in goldfish.

Victor Ajuwon¹, Mark Walton², Tiago Monteiro² and Alex Kacelnik²
¹ Department of Zoology, University of Oxford
² Department of Experimental Psychology, University of Oxford
victor.ajuwon@zoo.ox.ac.uk

Paying a cost to reduce uncertainty can be adaptive, because better informed decision-makers can align their preferences to opportunities. However, puzzlingly, in an experimental protocol referred to as ‘paradoxical’ or ‘suboptimal’ choice, mammals and birds display an appetite for functionless (non-instrumental) information. A question of importance for the theoretical interpretation of this phenomenon is its taxonomic ubiquity: If the same phenomenon were to be found in other distant animal lineages, this would support its interpretation as an adaptation to common characteristics of natural foraging scenarios, rather than as a maladaptive cognitive bias. Here, using a novel, closed-loop operant chamber based on real-time video tracking, we present paradoxical experiments exploring whether goldfish (Carassius auratus) display a preference for non-instrumental information. Fish chose between two equally profitable options delivering food probabilistically after a fixed delay. In the informative option (Info), the outcome (food/no food) was signalled immediately after choice, whereas in the non-informative option (NoInfo) outcomes were uncertain until the delay lapsed. Unlike in birds and mammals we did not find a preference for the information option in fish, raising further questions about the evolutionary origins of non-instrumental information value.

EPS Mid-Career Prize Lecture.

Becoming a reader.

Kate Nation
University of Oxford
kate.nation@psy.ox.ac.uk

Reading is a complex skill and learning to read takes time and effort. Much is known about the factors that predict individual differences in reading and its development. Critically however, we know relatively little about how children become expert. How do children move from the laborious process of ‘sounding-out’ individual words to the sense of effortlessness that we, as skilled readers, experience as we read? Broadly, the answer to this question is practice: reading is a skill and like all skills, practice is needed for expertise to emerge. For reading, practice may be important in two distinct ways: not only does it allow basic skills to be honed and fine-tuned, reading experience itself provides the substrate by which the statistical properties of the writing system become embodied in the child’s own reading system. This talk will consider how reading experience shapes learning, such that children become expert and written words become familiar.
Limited autonomic coherence to emotional stimulation.

Helio Cuvel¹,², Joseph Harper¹, Lucy Johnson¹, Caroline Catmur³ and Geoffrey Bird¹
¹ University of Oxford
² University of Birmingham
³ King’s College London
helioclemente.c@gmail.com

Emotion theory predicts coordinated autonomic mobilisation to emotional stimulation. However, due to the reliance of single-modality recordings and failure to explore potential multivariate profiles of autonomic responding to emotion, this empirical claim largely remains untested. While autonomic signals such as pupil changes, skin conductance (SCR), and heart rate (HR) are increasingly and interchangeably treated as markers of emotional experience, their degree of concordance is unclear. The current experiment investigated the concordance between the three physiological markers above and subjective emotional experience (valence and arousal) during an emotion-inducing task in 53 young non-clinical adults. Multivariate profiles of physiological responding were explored using data-driven clustering. Results suggest asymmetries in the relationship between subjective arousal and pupil change, SCR, and HR based on self-reported valence, reflecting individual differences in autonomic reactivity, subjective emotional experience, and their relationship. There was also limited concordance across the various physiological indices of autonomic activation, suggesting they cannot be used interchangeably as markers of emotional experience. Despite this lack of concordance, data-driven clustering revealed sub-groupings of multivariate profiles of physiological responses that loosely mapped onto self-reported valence and arousal. This work questions traditional views of physiological mobilisation to emotion with implication for basic and applied emotion theory.

The relationship between the processing of one's own and others' interoceptive states in adolescence, adulthood, and older age.

Lara Carr, Federica Biotti, Dawn Watling and Rebecca Brewer
Royal Holloway, University of London
lara.carr.2016@live.rhul.ac.uk

Alexithymia is a multifaceted personality construct, typically characterised by difficulties identifying and describing one’s own emotions. Beyond the difficulties associated with alexithymia in the self, research has linked alexithymia with a deficit in the processing of others’ emotions across various domains, including memory, appraisals, and attention. This suggests that understanding one’s own emotions is critical in the processing of others’. Despite this, research is yet to investigate the processing of non-emotional internal states (e.g., temperature, pain, and nausea) in others. Nonetheless, the emotion literature suggests that the ability to detect and attend to these states in oneself, termed interoception, may be closely related to the processing of interoceptive states in others. The current study is the first to investigate individuals’ interpretation of interoceptive stimuli through their propensity to assign an interoceptive or action label to body images (e.g., 'cold’ or 'rubbing arms’), and its relationship to self-reported interoceptive accuracy and attention, in adolescence, adulthood, and older age. A bias towards interoceptive interpretations of stimuli was positively associated with one’s own self-reported interoceptive accuracy and attention, although relationships varied across different stages of development. Results are discussed in terms of the potential impact of altered interoception on social perception.
No Evidence for Egocentric Bias on an Explicit False Belief Task in Adults: a Mouse Tracking Paradigm.

Richard O’Connor, Andrew Lucas and Kevin Riggs
University of Hull
richard.oconnor@hull.ac.uk

Theories of belief processing typically assume that processing another agent's false belief requires inhibition of one's salient current knowledge. Computer mouse tracking was used to attempt to measure, in adults, egocentric bias towards one’s current knowledge during a false belief task. Participants viewed video scenarios in which an agent had either a true (“TB-scenarios”) or a false (“FB-scenarios”) belief as to the location of an object. Participants used a mouse to answer questions about the final location of the object (“reality”) and where the agent thinks it is (“belief”), choosing from two possible answers. Response time (RT) and mouse-tracking measures indexing competition between response options during decision-making were measured. RTs were longer for responses to belief compared to reality questions, suggesting that participants did not automatically process beliefs but had to infer them in response to the question. Mouse tracking measures found similar levels of competition during this decision-making process for belief questions on both TB- and FB-scenarios, and also for reality questions on the FB-scenario. This suggests that belief processing in general involves resolving competition between possible belief states, with no evidence that response options reflecting participants’ current knowledge generated egocentric bias on this particular task.

Exploring the relationship between loneliness and social cognition in older age.

Martina De Lillo¹, Andrew Martin² and Heather Ferguson²
¹ University of Birmingham
² University of Kent
m.delillo@bham.ac.uk

Understanding others is a key component of successful social interactions, and declines in social abilities during later life can lead to social isolation and loneliness. We investigated the relationship between different sub-components of social cognition and loneliness in a large sample of older adults. We tested perspective-taking and mentalizing skills, alongside self-reported loneliness and social functioning. Results revealed that loneliness correlated significantly with older adults’ ability to resist egocentric interference when taking others’ perspectives. However, mediation models showed that this effect occurred only indirectly via age; egocentric tendencies increase with age, and people experience increasing levels of loneliness and feelings of social isolation with increasing age. Mentalizing and interference from others’ perspectives were not influenced by loneliness or age.
Perceptual orientation and legitimacy of interpersonal cues to endangerment.

Harry Piper, Paloma Mari-Beffa, and Maria Manoli
Bangor University
piperhmr20@gmail.com

Our ability to detect interpersonal threat can be critical for our safety in multiple social contexts. Our aim was to create a psychometric tool to measure threat perception in interpersonal naturalistic contexts using video footage. Different videos depicting threatening and non-threatening situations were measured according to different variables such as a) number and type of threatening visual cues present in that footage, b) subjective level of threat perceived (Threat Perception, TP) and c) a force-choice prediction of the outcome of the situation (aggression/non-aggression, Threat Detection TD).

Results demonstrated that both TP correlated with the number of visual cues present in each video (.89) providing a very strong convergent validity for the TP index (Cronbach .93). In addition, the TD index also demonstrated a moderate split half reliability (.63). When tested in normal population, results demonstrated that TP declined with age, whereas TD remained constant. These results contrasted with those observed with police officers who consistently scored higher than controls in TP, but not TD. This is the first time a naturalistic psychometric measure of threat detection has been created. Its applications in emotional regulation and social cognition future experiments are discussed.

How should we measure metacognitive judgements of episodic memory during ageing?

Astrid Emilie Lund, Megan Lawrence and Charlotte Russell
King's College London
astrid.lund@kcl.ac.uk

Metacognition is our ability to know about our cognitive processes, including our ability to remember specific events, known as episodic memory. For many people episodic memory (1), metacognitive judgements (2) may become impaired with age. Thus, older individuals may have impaired ability to gain knowledge about their episodic memory. In most research metacognitive judgements are measured as confidence ratings. However, other types of metacognitive reports may more accurately represent individuals’ knowledge of their episodic memory. To investigate this, 58 older participants (60+ years) and 42 young participants (18-35 years) were recruited. Participants were shown short videos of everyday objects, and the following day their memory for these videos were assessed. Additional to cognitive measures they provided various metacognitive judgements, including reports of prospective and retrospective confidence, and how well they felt they could visualise the memory. Results indicated no difference in the cognitive performance between age groups, but older participants were less confident and metacognitively accurate. Interestingly, participants were more metacognitively accurate when giving visualisation reports, than reporting confidence. Thus, the ability to visualise a memory may more accurately represent an individual’s metacognitive ‘access’ of that memory, than the confidence reports.
Age of acquisition effects in recognition without identification tasks.

Mahmoud Elsherif¹, J. C. Catling¹, C. Pymont², R. A. Johnston³, R. Clark¹ and E. Kendall¹
¹ University of Birmingham
² Canberra University, Australia
³ University of Kent
mahmoud.medhat.elsherif@gmail.com

The Age of Acquisition (AoA) effect results in early-acquired words being processed more quickly and accurately than later-acquired words. This effect is argued to result from a gradual development of semantic representations and a changing neural network throughout development (Chang, Y.-N., Monaghan, P., & Welbourne, S., 2019). Some forms of the Recognition Without Identification (RWI) effects have been observed at a perceptual level. The present study used the RWI paradigm to examine whether the AoA effect is located at the perceptual loci. A total of 174 participants were presented a list of pictures (Experiment 1) or words (Experiment 2) followed by a list of mixed early- and late-acquired picture or word fragments that participants had to identify; half of which corresponded to studied words and half of which to unstudied words. Irrespective of whether the item was identified, participants then rated the likelihood that the item appeared in the study phase. In both experiments, results showed that studied items were recognised more accurately than unstudied items, even when they could not be identified and late-acquired items were recognised more than early-acquired items, even when they were not identified. Finally, RWI interacted with the AoA effect only in pictorial stimuli, suggesting that the RWI and AoA effects are located at the perceptual level.

The interaction between emotional content and contextual details in episodic memory.

Ruolan Zhang and Charlotte Russell
King's College London
ruolan.1.zhang@kcl.ac.uk

The interaction between contextual details and emotional content in episodic memory have been controversial. Some claim that strong emotional items enhance all other elements of the memory. While others suggest that contextual details are less well recalled, while emotional content is remembered very well. Here we examine this relationship. 51 participants (aged 18-35) encoded 80 composite images consisting of a face superimposed on a neutral background. Photograph of the same location was taken from three perspectives: the right; the left and from the front. During recognition trials, participants were asked to press “old” or “new” to answer whether they had seen a face, presented in isolation. If they pressed “old”, they were asked to choose which, from the three perspectives of background photos of the same location, the face had been previously paired. Performance, as measured with both proportion correct and d’ sensitivity, revealed participants to be significantly better at recognising negative faces than recognising positive faces. Crucially, participants were both more sensitive and more accurate in detecting the correct background context under the negative condition. This suggests that negative emotional stimuli do not necessarily lead to poorer memory for visuo-spatial background context.
The interdependence of emotional valence and expectedness in memory.

Aisha Mukhtar and Alex Kafkas
University of Manchester
aisha.mukhtar@postgrad.manchester.ac.uk

Emotional stimuli usually result in better recognition than neutral stimuli; however, the reason behind the superiority of emotional memory remains poorly understood. In the present study we investigated the effect of event distinctiveness and expectedness on memory formation for neutral and emotional stimuli. A list of 330 emotional pictures from the International Affective Picture System (IAPS) were selected. To manipulate expectation, firstly, in a rule-learning task, participants learned the systematic relationship between six symbols and the frame (purple or orange) accompanying each stimulus. At encoding, a new set of neutral, positive and negative stimuli were encoded, while the established rules were violated for some stimuli (40%), while it remained intact for the rest (i.e., expected stimuli). The findings on memory performance showed an interaction between expectation, type of reported memory and emotion type. Consistent with previous findings, expectation had opposite effects on recollection and familiarity, with unexpected stimuli increasing recollection and expected ones boosting familiarity performance. However, this was only true for negative and neutral stimuli but not for positive ones. The findings have implications for the conditions under which emotional content enhances memory and show that expectation violation contributes to memory enhancement and interacts with emotional content.

TDCS effects on visual working memory over Dorsolateral prefrontal cortex and Posterior parietal cortex: A conceptual replication study of Wang et al. (2019).

Shuangke Jiang, Myles Jones and Claudia von Bastian
University of Sheffield
sjiang17@sheffield.ac.uk

Transcranial direct current stimulation (tDCS) has gained growing research interest as a promising intervention tool to enhance visual working memory (VWM) performance. Previous evidence indicates a correlation between VWM performance and neural activities in the dorsolateral prefrontal cortex (DLPFC) and posterior parietal cortex (PPC). Recently, Wang et al. (2019) found that anodal tDCS over PPC, but not over DLPFC, selectively improved VWM capacity but not VWM precision. However, the original study has some potential issues, such as a small number of participants (n = 18) and trials, and incomplete counterbalancing, which could have led to overestimated effect sizes, unreliable estimation of VWM performance, and carryover effects. Using a continuous reproduction task and study design that account for these weaknesses identified in Wang et al. ’s (2019) study, in the present pre-registered study (n = 48), we failed to replicate the selective effect of PPC stimulation. Instead, our results suggest null effects of tDCS independent of stimulation location compared to the sham condition. If anything, although not significant, anodal PPC stimulation tended to decrease capacity in the present study rather than improve capacity as in Wang et al. (2019). Further exploratory analyses showed that anodal PPC stimulation induced more swap errors in VWM performance. The patterns of our results challenge previously reported benefits of anodal tDCS on VWM.
**The psychophysiological mechanisms of real-world time experience.**

Ruth Ogden¹, Chelsea Dobbins², Kate Slade³, Jason McIntyre¹ and Stephen Fairclough¹

¹ Liverpool John Moores University
² University of Queensland, Australia
³ Lancaster University

r.s.ogden@ljmu.ac.uk

Our sense of time is fallible, often resulting in the sensation of time flying by quickly or dragging slowly. Theoretical models and laboratory studies suggest that changes in sympathetic (SNS) and parasympathetic nervous system (PSN) activity may be determinant of distortions to the passage of time, however these suggestions have never been tested during real-world temporal experience. The current study therefore explored the relationship between real-world temporal experience and SNS-PSN activity. Sixty-seven participants completed a normal day’s activities whilst wearing wearable electrocardiogram, electro-dermal-activity and movement sensors to measure ambulatory SNS and PSN activity. They also provided hourly rating of the subjective speed at which time was passing. The results revealed that greater SNS activity was associated with time passing more quickly. PSN activity was not predictive of temporal experience. The findings confirm the importance of physiological arousal in temporal experience and provide empirical support for current theoretical models of real-world temporal experience.

**Probability cueing in large-scale environmental search: A role for landmark cues in statistical learning.**

Shaun Dordoy, Rory Baxter and Alastair Smith
University of Plymouth
shaun.dordoy@plymouth.ac.uk

Efficient environmental search is an important and adaptive everyday skill. A particular feature of theoretical interest is whether large-scale search is informed by the spatial statistics of the environment as studies of probability cueing have generated equivocal findings. Here we examined whether sensitivity to a statistical cue specified within an allocentric reference frame is modulated by the presence and location of environmental landmarks. Participants explored fully-immersive virtual environments, wherein they were presented with an array of locations (columns) and required to search them for a hidden target (i.e. the column that changed colour upon activation). A target was present on each trial, appearing within the cued hemispace on 80% of trials. In Experiment 1, the array was surrounded by a featureless circular wall and participants exhibited no reliable cueing effects. Experiments 2 and 3 introduced a stable landmark into the environment and manipulated its location to be either orthogonal or adjacent to the cued hemispace. Participants reliably biased their search in response to the probability cue, although learning was more robust when the landmark was along the axis orthogonal to the midline. These findings suggest that the presence of stable landmarks facilitates the learning of a target’s spatial distribution.
Dilated and constricted pupils capture attention during different time intervals.

Ralph Pawling and Hannah Taylor
Liverpool John Moores University
r.pawling@ljmu.ac.uk

Although very subtle, and often processed unconsciously, changes in pupil size offer an externally visible cue to otherwise invisible states of arousal in others. As such, it is perhaps not surprising that pupil size appears to influence person perception, as well as approach and avoidance behaviours, in a similar way to overt facial expressions of emotion. The current online study asked whether like some emotional expressions, pupil size as a salient social cue might capture visual attention. Participants completed a dot probe task during which they saw pairs of laterally positioned faces, of which one would display pupil dilation and the other constriction. The faces were selected from amongst pools of stimuli rated as particularly trustworthy or untrustworthy looking, as attentional capture by pupil size might be driven by its potential to indicate threatening arousal, as opposed to safe interest. The results indicated that in the early stages of processing visual attention was captured by faces with constricted pupils and in later stages by faces with dilated pupils. Cautiously, we interpret this effect as being driven by the novelty or extremity of the constricted pupil. Currently, we are further investigating this effect using eye-tracking in the laboratory.

Frustrative non-reward causes generalised inhibition that affects performance on attentional blink task.

Adam Dede and Elizabeth Milne
University of Sheffield
a.dede@sheffield.ac.uk

Many frustrating events involve a loss of reward--termed frustrative nonreward. The affective reaction to frustrative nonreward can last for some time. Anecdotally, everyone has experienced how frustration changes behaviour after the initiating event is over. We measured changes in attentional control following frustrative nonreward. First, participants made same/different judgments about images. Some participants were told that good performance would yield a large reward, but good performance was unattainable (frustrative nonreward group; FN group). The control group was warned that the task would be difficult and only be worth a small reward (control group). Despite similar performance and identical reward, the FN group reported higher levels of frustration. Next, all participants were similarly tested using the attentional blink (AB) paradigm. Classically, this paradigm finds that detection of a second target is impaired when it occurs within 200-500ms after the first target. We predicted that the severity of impairment would be greater for the FN group, and this was so. Multiple cognitive factors contribute to the AB deficit. Previous frustration increased inhibition of distractors in the AB task. This phenomenon may adaptively help individuals avoid distracting and ruminative thoughts but at the cost of missing potentially useful or relevant information.
The effects of counterfactual thinking on unilateral forgiveness.

Masi Noor¹, Mauro Bertolotti², Patrizia Catellani² and Iwan Dinnick¹
¹ Keele University
² Università Cattolica del Sacro Cuore, Italy
m.noor@keele.ac.uk

We investigated whether counterfactual thinking affects victims’ willingness to forgive. In two studies, participants were asked to recall a situation in which someone close to them made them feel upset or hurt. After writing down the recalled victimisation event, participants were required to generate counterfactual sentences focused on the perpetrator (Study 1, N = 212 Italian students) or on the victim (Study 2, N = 196 Italian students) and were randomly allocated to either the additive condition (i.e., “Things would have been different if he[she] had...”), or the subtractive condition (i.e., “Things would have been different if he[she] had not...”). Then, all participants responded to the main measures tapping our key dependent variables. Results from Study 1 showed that additive (vs. subtractive) counterfactuals focused on the perpetrator were associated with greater (vs. lesser) willingness to take the perpetrator’s perspective and forgive. Study 2 provided further evidence corroborating the effects of additive (vs. subtractive) counterfactuals when counterfactuals were focused on the victim. The effects of both perpetrator- and victim-focused counterfactuals were not moderated by offence severity and temporal distance (Studies 1-2), while the effects of victim-focused counterfactuals were moderated by the attribution of responsibility to the perpetrator (Study 2). Our results indicate that when a shared understanding of past events between victims and their perpetrators is not likely or possible, victims can still individually reassess past events, considering not only what has happened, but also what could have happened instead. Paths enabling victims to find peace of mind and free themselves from the entrapment of victimhood are rare. Through tapping victim’s own cognitive resources, counterfactual thinking may offer one such rare path.

Grammar but not vocabulary learning at 17 months predicts language skills at 54 months.

Lana Jago¹, Padraic Monaghan¹, Kate Cain¹, Katie Alcock¹, Seamus Donnelly², Caroline Rowland², Rebecca Frost³, Michelle Peter⁴, Samantha Durrant⁵ and Amy Bidgood⁶
¹ Lancaster University
² MPI Psycholinguistics Nijmegen, The Netherlands
³ Edge Hill University
⁴ Great Ormond Street Hospital
⁵ Manchester University
⁶ Salford University
ljago@lancaster.ac.uk

This study determined the extent to which measures of infants’ language learning at 17 months old could predict developing language skills at 54 months. We tested 71 children on an artificial language learning task where both vocabulary and grammar learning were assessed. We then determined the extent to which performance on these learning tasks related to multiple measures of natural language vocabulary and grammar at 54 months, just before children began school. Using structural equation modelling, we found that grammar learning, but not vocabulary learning, at 17 months predicted language skills at 54 months, and this relation was general across both later vocabulary and grammar skills. The results were surprising given that a previous study on the same
group showed that artificial language vocabulary learning predicted children’s vocabulary development up to 30 months (Frost et al., 2020, Cognitive Psychology). Grammar learning thus comes to predict children’s language skills at a later stage of maturation.


Exploring the components that influence the side-effect effect (AKA the Knobe effect).

Bradley Kennedy, Annie Scudds, Moira Lafferty and Suzanne Stewart
University of Chester
b.kennedy@chester.ac.uk

Knobe (2003) showed that people are more likely to say that harmful side effects are brought about intentionally compared with helpful side effects. Furthermore, people assign more blame for harmful side effects than they do praise for helpful side effects. Knobe named this asymmetry the ‘side-effect effect’ (SEE). Thus, observers appear to utilise the moral valence of actions’ unintended consequences to determine intentionality and deserved praise and blame. Following work that shows character descriptions can moderate the SEE (Stewart et al., 2021), the current research investigates whether varying specific agent traits moderates the SEE. After a successful replication of Knobe (2003), three experiments examined whether the agent’s (1) job role, (2) the description of their powerfulness, and (3) their sex moderated the SEE. The agent's job role and their sex did not significantly moderate the SEE. However, the agent's level of power moderated the SEE, such that those with less power were judged to deserve more blame for their actions than those with high levels of power. Future work will investigate how participants utilise information about agents’ power to understand the results, for example, the possible role of norm violation.


Verb-phrase internal subjects and incremental processing: Evidence from semantic priming during self-paced reading.

Paul Stott
University of Manchester
paul.stott-2@postgrad.manchester.ac.uk

We tested the Verb-phrase Internal Subject Hypothesis (VPISH), which claims that subjects are generated VP-internally before moving to their sentence-initial surface position (see [1, 2]), using a Self-Paced Reading/Lexical Decision Task paradigm. Participants (n=28) read sentences (n=16) like (1). (1) The cyclist knowing and intentionally [VP ignored the warnings,] [TAG suggests the Guardian.] LDT was administered immediately following the VP or TAG verb. The probe was semantically related/unrelated to the sentential subject and presented alongside a nonce. VPISH predicts a VP-internal trace that is co-indexed with the overt sentential subject. Semantically related probes should be responded to faster than semantically unrelated probes following the VP verb and faster than semantically related probes following the TAG verb. There was a significant ProbeType*ProbePosition interaction (p<.001). RTs in the VP1-Related condition were significantly faster than in the VP1-Unrelated (p< .001) and TAG-Related (p=.036) conditions. We conclude that the antecedent subject is re-accessed within the VP. Results are compatible with VPISH; they are also compatible with an account where the subject is held in Working Memory until it can be composed. Further work will explore this by introducing additional material between sentential subject and VP. Findings will contribute to understanding how long-distance dependencies are processed.


Rachel Hagan, Ralph Pawling, Francis McGlone and Susannah Walker
Liverpool John Moores University
r.hagan@ljmu.ac.uk

Genetic taster status (GTS) is an inherited relative sensitivity to taste stimulation, assessed via density of the fungiform papillae on the tongue and/or perceptual sensitivity to the bitter compound 6-n-Propylthiouracil (PROP). However, the effects of GTS on flavour preferences goes beyond bitter tastants. For example, there are significant relationships between GTS and responses to chemesthetic (trigeminal) and astringent (tactile) stimuli. Hedonic responses to oral stimuli are typically measured using subjective rating scales. The aim of this study is to determine whether Facial Electromyography (EMG), an established implicit measure of affect, can predict individual differences in dis/liking of bitter tasting, chemesthetic, and astringent compounds. Participants will be pre-screened for GTS. Then, trial by trial, facial EMG responses to threshold and super-threshold concentrations of caffeine (bitter), menthol (chemesthetic) and alum (astringent) will be measured. It is hypothesised that super-tasters (high PROP sensitivity) will display increased negative affect-related facial muscle activity, and lower affective ratings to all stimuli than non-tasters (low PROP sensitivity). Responses to the three oral stimuli will be analysed individually using multi-factorial analyses to compare mean muscle activity and hedonic ratings at each concentration level (x2), between taster status groups (x2).
Research Plan - Neural coding of goals in voluntary action.

Silvia Seghezzi¹, Stefan Bode², Stephen Fleming³,⁴,⁵ and Patrick Haggard⁴
¹ Institute of Cognitive Neuroscience, University College London
² University of Melbourne, Australia
³ Department of Experimental Psychology, University College London
⁴ Max Planck University College London Centre for Computational Psychiatry and Ageing Research
⁵ Wellcome Centre for Human Neuroimaging, University College London
s.seghezzi@ucl.ac.uk

Making goal-directed actions is a defining feature of human volition (1). This project will investigate the neural coding of goal representations and their temporal evolution while an action plan is unfolding. Goal coding might be realised by representing a set of operations necessary to transit from an initial state to a goal state (optimal motor control theory; “deep coding”), or by perceptual matching the visual similarity of transition states (“shallow coding”). We will address this question by using a modified version of the Tower of London (ToL) task (2) in combination with functional magnetic resonance imaging (fMRI). The ToL requires moving balls across pegs until a final goal state is reached, sometimes involving counterintuitive moves, which are visually more dissimilar to the goal state. This allows for independently tracking neural representations of goal state and visual similarity by implementing a time-resolved searchlight variant of representational similarity analysis (RSA) to identify the neural substrates of goal pursuit in voluntary action.


Attention to social interactions in real-world scenes: Evidence from change blindness.

Mahsa Barzy¹, Rachel Morgan¹, Richard Cook² and Katie Gray¹
¹ University of Reading
² Birkbeck, University of London
m.barzy@reading.ac.uk

In flicker paradigms, changes to social aspects of a scene are better detected than non-social aspects. Whilst previous studies have focused on how changes to individual faces/bodies are detected, it is possible that individuals in social interactions may be further prioritised, as the accurate interpretation of social interactions may convey an evolutionary advantage. Over three experiments, we explored change detection to complex real-world scenes, in which changes either occurred by the removal of a) an individual on their own, b) an individual who was interacting with others, or c) an object. We ran an inverted version of each task to determine whether differences were driven by low-level visual features. Changes to non-interacting and interacting individuals were detected faster than changes to objects. We found inversion effects for both non-interaction and interaction changes, whereby they were detected quicker upright than inverted. We found no inversion effect for objects, suggesting that the high-level content of the social images was driving the improved change detection versus objects. We also found that changes to individuals in non-interacting configurations were detected faster than those interacting. Thus, changes to individuals in social interaction configurations do not appear to be more easily detected than those in non-interacting configurations.
Older adults across the globe exhibit increased prosocial behaviour but also greater in-group preferences.

Jo Cutler¹,², Jonas Nitschke³,⁴, Claus Lamm³ and Patricia Lockwood¹,²
¹ University of Birmingham
² University of Oxford
³ University of Vienna, Austria
⁴ McGill University, Canada
J.L.Cutler@bham.ac.uk

Population ageing is a global phenomenon with substantial implications across society. Prosocial behaviours—actions that benefit others—promote mental and physical health across the lifespan and can save lives during the COVID-19 pandemic. We examined whether age predicts prosociality in a preregistered global study (46,576 people aged 18–99 across 67 countries) using two acutely relevant measures: distancing during COVID-19 and willingness to donate to hypothetical charities. Age positively predicted prosociality on both measures, with increased distancing and donations among older adults. However, older adults were more in-group focused than younger adults in choosing who to help, making larger donations to national over international charities. Age was also linked to higher in-group preference, the tendency to favour one’s own group and its characteristics over that of other groups. In-group preference positively predicted distancing and national giving, but negatively related to international giving. We show that age is robustly associated with willingness to help others, but that helping becomes more biased towards in-groups, people more similar to ourselves. These findings have important implications for predicting the social and economic impacts of an ageing society, as well increasing compliance with public health measures and encouraging charitable donations in times of global crisis.

Knock yourself out: Brief mindfulness-based meditation eliminates self-prioritization.

Marius Golubickis¹, Lucy Tan², Sara Saini¹, Kallum Catterall¹, Aleksandra Morozovaite³ and C. Neil Macrae³
¹ University of Plymouth
² University of Queensland, Australia
³ University of Aberdeen
marius.golubickis@plymouth.ac.uk

Recent research has suggested that self-prioritization is an inescapable facet of mental life (Sui & Humphreys, 2017), but is this viewpoint correct? Acknowledging the flexibility of social-cognitive functioning, here we considered the extent to which mindfulness-based meditation — an intervention known to reduce egocentric responding (Golubickis et al., 2016) — attenuates self-bias. Using an object-classification task (Golubickis et al., 2018), participants (N = 160) reported the ownership of previously assigned items (i.e., owned-by-self vs. owned-by-friend) following a 5-minute period of meditation with or without a mindfulness-based component. The results revealed that mindfulness meditation abolished the emergence of the self-ownership effect, whereas during control meditation (i.e., participants that focused on their thoughts) a standard self-prioritization effect emerged (i.e., self-related responses are faster than friend-related). An additional computational (i.e., Drift Diffusion Model) analysis indicated that mindfulness both eliminated a pre-stimulus bias toward self-relevant (vs. friend-relevant) responses and facilitated the rate at which evidence was accumulated from friend-related (vs. self-related) objects. Collectively, these findings elucidate the stimulus and response-related operations through which mindfulness-based meditation tempers
self-prioritization.


Do presence of people and perspective impact upon aesthetic and tourist judgements of tourist destination images?

Sonia Malvica¹, Letizia Palumbo² and Valentina Cazzato³
¹ University of Messina, Italy
² Liverpool Hope University
³ Liverpool John Moores University
sonia.malvica@unime.it

Photographs might trigger a first impression of a potential tourist destination, even before the visit occurs [1]. We previously showed that sensorimotor mechanisms, based on a tourist’s sense of bodily presence and of exploration might play a role in destination photography’ aesthetic and tourist judgements [2]. Here, we extended our results by adopting a factorial design which allowed to disentangle the contribution of two factors, namely presence of conspecifics (presence vs. no-presence) and type of perspective (explorative vs. contemplative) of a depicted environment [3,4] to aesthetic and tourist judgements. Forty-three participants (M = 27.37, SD = 8.67) provided their subjective ratings of perceived dynamism, emotionally moving, liking and tourist judgements to 100 photographs of urban and natural tourist landscapes. Results suggested that regardless of the type of perspective, participants rated more dynamic those destination images with presence of people. On the contrary, participants’ liking and tourist judgements were greater for those destinations displaying no people in the scenario. Furthermore, regardless of people’ presence, participants provided higher liking and tourist ratings for those images with a contemplative perspective. We suggest that an embodied approach during the contemplation of broader scenario is necessary to its aesthetic appraisal and tourist destination choice.

Type of polysemy matters: Evidence from semantic relatedness decisions.

Greg Maciejewski¹, Jack Taylor² and Ekaterini Klepousniotou³,⁴
¹ University of the West of Scotland
² University of Glasgow
³ University of Leeds
⁴ Carnegie Mellon University, United States of America
greg.maciejewski@uws.ac.uk

Research into semantic ambiguity has established that homonyms with multiple unrelated meanings inhibit semantic processes, whereas polysemes with multiple related senses tend to facilitate them. However, more recent work suggests there may be important differences among polysemes. To explore this idea further, we examined semantic relatedness decisions to metonymic polysemes with conventional, predictable sense extensions (e.g., 'fluffy/spicy rabbit'), irregular polysemes with unconventional, unpredictable sense extensions (e.g., 'Windows/food menu'), and metaphorical polysemes with figurative sense extensions (e.g., 'wooden/authoritative chair') as well as homonyms (e.g., 'river/money bank') and unambiguous words. Three experiments manipulated the duration of presentation of ambiguous words (200/500/800 ms) to also delineate the time course of access to the different senses. The findings suggest that just like homonyms, irregular polysemes have separate representations that inhibit semantic processes. Metonymic and metaphorical polysemes, on the other hand, appear to have a single, semantically rich representation that mainly corresponds to the dominant sense, with the alternative sense being generated online through rules of sense alternation (metonymic polysemes) or based on surrounding context (metaphorical polysemes). Overall, the findings support the distinction within polysemy and help to advance or constrain existing theoretical work on the representation and processing of ambiguity.

The role of transitional probability in cortical tracking of hierarchical linguistic structures.

Fan Bai, Antje Meyer and Andrea Martin
Max Planck Institute for Psycholinguistics, The Netherlands
fan.bai@mpi.nl

A fundamental question in speech perception is how continuous speech signals are segmented by the brain. A study by Ding et al. (2016) suggested that the rhythm of hierarchical structures in speech can be reflected in the neural activities at the corresponding frequencies. The authors explained the phenomenon as the cortical tracking of linguistic units by top-down grammatical chunking. However, online chunking clearly benefits from the transitional probability (TP) between linguistic units. Saffran et al. (1996) found that infants could extract ‘words’ from fluent ‘speech’ after a two-minute exposure, in which TPs were considered as a key in the speech segmentation. A natural question raised by comparing the conclusion of these two studies is whether the cortical tracking effect could be driven by the TPs. We conducted a six-session Magnetoencephalography (MEG) experiment with Dutch native speakers (who do not know Chinese) to investigate the role of TPs in the cortical tracking effect. Using Discrete-Time Fourier Transform (DFT) with Generalized Eigen-Decomposition (GED), our analysis indicated that cortical tracking could be introduced solely by TPs. Our results supported the conclusion that was drawn by Saffran et al. (1996), and provide neural evidence for the role of TPs in speech segmentation.

49


Return Sweeps during Chinese Multiline Reading: The Influence of Text Justification and Column Setting.

Donna Gill¹, Mengsi Wang², Jeannie Judge¹ and Simon Liversedge¹
¹ University of Central Lancashire
² Tianjin Normal University, China
degill@uclan.ac.uk

Return sweeps are essential when reading multiline texts, yet we still lack a comprehensive understanding of this behaviour and models of eye movements have not accounted for return sweeps during reading. Presentation format may also place demands on the oculomotor system thereby impacting reading behaviour. We examined text alignment and column number on global/local reading measures for return sweeps. Native Chinese readers read multiline passages of text presented in either left-aligned or fully justified format, and one or two columns. The presentation format did not influence global measures, yet differences emerged when examining return sweep behaviour. Readers fixated further to the extremes of the lines in one column than two columns and in left-aligned text compared with fully justified text. Chinese readers were more likely to undershoot the target following a long than a short return sweep and undersweep fixation durations were impacted by the magnitude of the preceding return sweep. These results demonstrate similarities in the execution of the return sweep between alphabetic and logographic scripts, as well as progressing the field in the direction of a holistic computational model of eye movements in reading.

How does art knowledge training impact judgments of artworks?

Ionela Bara¹, Emily Cross²,³ and Richard Ramsey⁴
¹ Bangor University
² University of Glasgow
³ Department of Cognitive Science, Macquarie University, Australia
⁴ Department of Psychology, Macquarie University, Australia
ionela.bar@bangor.ac.uk

The study of acquiring art knowledge can provide insight into the structure of underlying cognitive systems that supports skill acquisition and skill transfer. However, little is known about the impact of art knowledge training on judgments of artworks. In the current pre-registered study, we used a training intervention paradigm and multi-level Bayesian modelling approaches to investigate the ways in which an art lesson impacts subsequent judgments of artworks. During pre- and post-training, seventy-one art-naïve participants assigned ratings to representational artworks on several dimensions: preference, understanding, emotions, and artistic skill. During the training session, participants completed a 25-minute visual art knowledge lesson. The results showed an effect of training on aesthetic preference, understanding, emotions, and artistic skill ratings, indicating stronger evaluative judgments for trained rather than for untrained artworks. Furthermore, the effects
of training generalise to unseen artworks as a function of how similar the unseen artwork is to the 
training materials. Specifically, the effects generalise to unseen artworks produced by the same, but 
not a different artist. Overall, these findings suggest that art knowledge shapes judgments of 
artworks, whilst also indicating constraints of the art training generalisability effects to novel 
artworks.
20th Mid-Career Prize Lecture

will be delivered by

Professor Kate Nation

University of Oxford.

Becoming a reader.

5.00pm, Thursday 31st March 2022

The Ballroom

Zoom Link to join this lecture.

No registration is required to attend in person.
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 (Entries should be made in clear black type) before signing and returning to the EPS Administrator: expychsoc@kent.ac.uk or sending to:

Sam Hurn
EPS Administrator
School of Psychology
Keynes College
University of Kent
Canterbury
CT2 7NP

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 two EPS members.

These forms should be returned by 1st September.

See Criteria and Procedures on following page.
CRITERIA AND PROCEDURES TO JOIN

Soon after the closing date of 1st September, 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 research study poster to the Society at one of the three EPS 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 he/she 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.

The EPS has secured a special rate from the Marriott hotel on campus for a limited number of rooms, which you can book via the link below. The cost is £99 for Bed and Breakfast and £94 for Room only. Anyone wishing to add another person to their room just needs to call the hotel once the reservation is made and they can increase the occupants to 2 people for the £10 extra.

Exceptionally, for Grindley Grant applications we will increase the accommodation cost limit to £99 per night, for up to two nights, for the first 20 valid applications. Otherwise, normal Grindley Grant limits will apply.
Conference Dinner.

The conference dinner will be held on Thursday 31st March from 8pm in the Ballroom.

The standard dinner cost for EPS members and non-members is £25.00. Please note that postgraduates can book at a reduced fee of £12.50. To receive this rate, please email Sam Hurn, the EPS Administrator, at expsychsoc@kent.ac.uk within 48 hours of your booking providing evidence of your postgraduate status by emailing your student registration letter, a letter from your supervisor or ask your supervisor to send a direct email confirming your postgraduate status.

You will need to indicate your choices of food from the below:

Starters:
- Goats cheese panna cotta – With beetroot relish, pea shoots and lemon dressing. (Vegetarian / Gluten Free)
- Scorched Mackerel – With Potato salad and dill pickled cucumber. (Gluten Free)
- Roasted parsnip and curry oil soup (Vegan / Gluten Free)

Mains:
- Pakington Chicken – Breast and confit leg, tarragon fondant potato and shallot with tomato jus (Gluten Free)
- Scottish Salmon – With Spinach and fennel tart, dill and vermouth, charred courgettes and château potatoes. (Gluten Free)
- Celeriac, spinach, and spiced honey wellington – With Salsa Verdi and vine roasted tomatoes. (Vegan)

Desserts:
- Chocolate Delice – Salted caramel brownie with banana ice cream. (Vegan)
- Raspberry & vanilla torte – Lemon ice cream with a meringue shard.
- Caramelized banana parfait – With peanut brittle and chocolate soil. (Vegan / Gluten Free)

Food Outlets.

For other meal options during the conference, there are several food outlets on campus as well as in Newcastle-under-Lyme (20 minutes off campus by public transport, 10 minutes by taxi) and Stoke-on-Trent (45 minutes off campus by public transport, 15 minutes by taxi).

This meeting is scheduled to include the 50th Bartlett Lecture by Melvyn Goodale (with an accompanying symposium organised by Gavin Buckingham) and the 2022 EPS / BSA Undergraduate Prize talk by Caitlin Naylor.

In addition, we will be opening a portal for members and their guests to submit abstracts for oral and poster presentations.

Local Organiser: Peter Hancock