EPS
Experimental Psychology Society

MANCHESTER MEETING

10-12 April 2019

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. For explicit guidance on reporting at EPS meetings, please refer to the EPS handbook.

A scientific meeting will be held at the Samuel Alexander Building, University of Manchester, Lime Grove, Manchester, M13 9PP between 10 – 12 April 2019.

The local organisers are Andrew Stewart and Ellen Poliakoff.

Twenty Sixth EPS Prize Lecture
Thursday 11 April, 6:00 pm

> What kind of deficit causes developmental prosopagnosia?
> Dr Richard Cook, Birkbeck University of London

Accompanying symposium
Thursday 11 April, 1:30 pm

> Individual differences in face processing
> Organiser: Katie Gray, University of Reading

Eighth Frith Prize Lecture
Wednesday 10 April, 5:00 pm

> The neurocognitive basis of episodic memory in autism
> Dr Rose Cooper, Boston College, USA

Joint EPS / BSA Undergraduate Project Prize winner talk
Thursday 11 April, 5:00 pm

> Computational mechanisms underlying flexible decision-making via instant decomposition
> Jacob Lagerros, University of Oxford

Local organiser symposium
Thursday 11 April, 9:00 am

> Characterising motor imagery
> Organisers: Andrew Stewart and Ellen Poliakoff

Poster Session – drinks reception

The poster session and drinks reception will be held on Wednesday evening at 6:00 pm in the foyer of the Samuel Alexander building. Delegates may put up posters from 12:30 pm and should take them down by the end of the session.

Platform Presentations

Sessions will be held in the Samuel Alexander Lecture Theatre and A101 Lecture Theatre.

Both theatres have data projectors available for PowerPoint presentations. Presenters may provide their own laptops and connector leads, or bring USB keys for the on-site computers. Any queries about facilities in the theatres should be sent to the local organisers Andrew Stewart (andrew.j.stewart@manchester.ac.uk) or Ellen Poliakoff (ellen.poliakoff@manchester.ac.uk).

Conference Dinner

The conference dinner will be held on Thursday 11th April at 8:00 pm at Zouk (https://zoukteabar.co.uk/) Unit 5, Chester Street, Manchester, M1 5QS. This is in the city centre and approximately a 15 minute walk from where the meeting is being held. The meal must be booked by 15th March.

Please use the following link to book your place at the Conference Dinner:
https://estore.manchester.ac.uk/conferences-and-events/division-of-neuroscience-and-experimental-psychology/experimental-psychology-society-meeting/experimental-psychology-society-meeting-april-2019

Session A

Samuel Alexander Lecture Theatre

1:30   **Dermot Lynott, Katherine Corker*, Louise Connell and Kerry O'Brien***
(Lancaster University, Grand Valley State University, USA and Monash University, Australia)
How does temperature affect behaviour? A meta-analysis of effects in experimental studies

2:00   **James Chard*, Richard Cook and Clare Press** (Birkbeck University of London) *Substitution Talk - In place of Wolohan et al*
Impaired sensitivity of older adults to the spatial configuration of faces and houses

2:30   **Annabel D Nijhof*, Caroline Catmur and Geoffrey Bird** (King's College London and University of Oxford)
Testing self-bias across different cognitive domains

3:00   Tea and coffee

3:30   **Paraskevi Argyriou* and Marie Levorsen*** (University of Manchester and University of Southampton) (Sponsor: Andrew Stewart)
An investigation of the relationship between empathy and gestures

4:00   **Alessandro Soranzo* and Marco Bertamini** (Sheffield Hallam University and University of Liverpool)
Social mechanisms affect perspective taking when reasoning about mirrors

4:30   **Mahsa Barzy*, Jo Black*, David Williams* and Heather J Ferguson** (University of Kent)
Online integration of speaker and meaning during language comprehension in autism spectrum disorder: Evidence from eye-tracking and ERPs

Eighth Frith Prize winner talk:

5:00   **Rose Cooper** (Boston College, USA)
The neurocognitive basis of episodic memory in autism

6:00   **Posters and drinks reception**

Session B

Lecture Theatre A101

1:30   **Catherine Thompson, Maryam Jalali* and Peter Hills** (University of Salford and Bournemouth University)
Attentional inertia: An effect limited to a viewer-centred frame of reference?

2:00   **Anthony McGregor, Adina Lew* and Matthew G Buckley*** (Durham University, Lancaster University and De Montfort University)
Spatial stability and cue type do not influence blocking in spatial learning

2:30   **Gonzalo Urcelay*, Selina Chadha* and Omar Perez*** (University of Leicester and California Institute of Technology, USA) (Sponsor: Kevin Paterson)
Delayed consequences lead to habits

3:00   Tea and coffee

3:30   **Robert D McIntosh, Elizabeth A Fowler*, Tianjiao Lyu* and Sergio Della Sala*** (University of Edinburgh)
Metacognitive differences are neither necessary nor sufficient for the Dunning-Kruger Effect

4:00   **Deborah Talmi, Lynn J Lohnas* and Nathaniel Daw*** (University of Manchester, Syracuse University, USA and Princeton University, USA)
A retrieved context model reveals drivers of the emotional oddball effect

4:30   **Emily A Williams*, Ruth S Ogden, Andrew J Stewart and Luke A Jones** (University of Manchester and Liverpool John Moores University)
Temporal difference thresholds and repetitive stimulation: Can click trains improve temporal sensitivity?

Eighth Frith Prize winner talk, Samuel Alexander Lecture Theatre:

5:00   **Rose Cooper** (Boston College, USA)
The neurocognitive basis of episodic memory in autism

6:00   **Posters and drinks reception**

Session A

Samuel Alexander Lecture Theatre

Symposium: **Characterising motor imagery**
                            Organiser: Ellen Poliakoff (University of Manchester)

9:00   **Stefan Vogt** (Lancaster University)
                Motor imagery during action observation: strengths, opportunities, weaknesses, and threats

9:30   **Nuala Brady** (Trinity College, Dublin)
                Motor imagery, embodiment and gender

10:00   **Juliane Scheil** (Leibniz Research Centre for Working Environment and Human Factors, Germany)
                Motor imagery and inhibition in task switching

10:30   Tea and coffee

11:00   **Emma Gowen, Andrius Vabalas, Alexander J. Casson, Ellen Poliakoff** (University of Manchester) *Substitution Talk - In place of Wriessnegger et al*
                Instructions to attend to an observed action increases imitation in autistic adults

11:30   **Francesca Garbarini** (University of Turin, Italy)
                Disentangling motor imagery and motor execution in normal and pathological conditions

12:00   **Robert M Hardwick, Svenja Caspers, Simon B Eickhoff and Stephan P Swinnen** (University of Leuven, Belgium)
                Neural correlates of motor imagery, action observation, and movement execution: A comparison across meta-analyses

12:30   Lunch

Session B

Lecture Theatre A101

9:00   **Alexis Makin, Giulia Rampone, Yiovanna Derpsch* and Marco Bertamini**
(University of Liverpool)
An ERP priming effect reveals independence of the extrastriate symmetry code

9:30   **Giulia Rampone, Marco Bertamini and Alexis Makin** (University of Liverpool)
Amodal representation of symmetry in the brain: an EEG/ERP evidence

10:00   **Alex Kafkas*, Stephen Ball*, Jason Taylor and Daniela Montaldi*** (University of Manchester)
Expectation modulates memory experience at retrieval: Behavioural and EEG evidence

10:30   Tea and coffee

11:00   **Johan Hulleman, Kristofer Lund* and Paul Skarratt** (University of Manchester and University of Hull)
Why knowing the orientation of the target only helps when visual search is difficult

11:30   **Francina Clayton*, Anna Steiner*, Karin Landerl* and Silke Göbel** (University of York and University of Graz, Austria)
Number writing and its relationship with arithmetic: does number word inversion matter?

12:00   **Sara V Milledge*, Hazel I Blythe and Simon P Liversedge** (University of Southampton and University of Central Lancashire)
Parafoveal pre-processing in English children: The importance of external letters

12:30   Lunch

Session A

Samuel Alexander Lecture Theatre

Symposium: **Individual differences in face processing**
                        Organiser: Katie Gray (University of Reading)

1:30   **Anna K Bobak, Sarah Bate, Natalie Mestry and Peter J B Hancock** (University of Stirling and Bournemouth University)
        Putting individual differences in face processing ability under the microscope: commonalities in performance across multiple tasks

2:00   **Rebecca Brewer, Federica Biotti, Katie L H Gray, Geoffrey Bird and Richard Cook** (Royal Holloway University of London, University of Reading, University of Oxford and Birkbeck University of London)
        Emotion recognition in autism: evidence for typical integration of emotion cues

2:30   **Martin Eimer and Katie Fisher** (Birkbeck University of London)
        How face-specific is developmental prosopagnosia?

3:00   Tea and coffee

3:30   **Tirta Susilo** (Victoria University of Wellington, New Zealand)
        Large sample studies of developmental prosopagnosia

4:00   **Romina Palermo, Laura M Engfors, Gilles Gignac, Marianne Thorburn, Ellen Bothe, Amber King, Kaitlyn Turbett, Xujia Wang, Prue Watson and Linda Jeffery** (University of Western Australia)
        The contribution of face-selective mechanisms and general cognitive abilities to individual differences in children's face recognition abilities

4:30   **Jodie Davies-Thompson, Sherryse Corrow, Kimberley Fletcher, Charlotte Hills, Raika Pancaroglu and Jason J S Barton** (University of British Columbia, Canada, Swansea University and Derby Hospitals NHS Foundation Trust)
        Training face perception in developmental and acquired prosopagnosia

End of Symposium

EPS/BSA Undergraduate Project Prize joint winner talk:

5:00   **Jacob Lagerros** (University of Oxford)
Computational mechanisms underlying flexible decision-making via instant decomposition

5:30   **EPS business meeting**
Samuel Alexander Lecture Theatre

Twenty Sixth EPS Prize Lecture:

6:00   **Dr Richard Cook** (Birkbeck University of London)
What kind of deficit causes developmental prosopagnosia?

8:00   **Conference dinner at Zouk**

Session B

Lecture Theatre A101

1:30   **Agata Dymarska*, Louise Connell and Briony Banks*** (Lancaster University)
Working memory for object concepts relies on both linguistic and simulation
information

2:00   **Briony Banks*, Cai Wingfield* and Louise Connell** (Lancaster University)
Linguistic distributional information and sensorimotor similarity both contribute to
semantic category production

2:30   **Rens van Hoef*, Louise Connell and Dermot Lynott** (Lancaster University)
Sensorimotor and linguistic information contribute to the basic-level advantage in
categorisation

3:00   Tea and coffee

3:30   **Emily Oxley*, Hannah Nash* and Anna Weighall** (University of Leeds and
University of Sheffield)
Can experimental word learning measures predict real word vocabulary growth for
children with English as an additional language (EAL)?

4:00   **Laura Ayravainen* and Nina Kazanina** (University of Bristol)
Learning spoken words from context

4:30   **Marie-Josee Bisson, Anuenue Baker-Kukona and Angelos Lengeris*** (De
Montfort University and University of Kent)
An ear and eye for language: Mechanisms underlying second language word
learning

**EPS/BSA Undergraduate Project Prize joint winner talk, Samuel Alexander Lecture
Theatre:**

5:00   **Jacob Lagerros** (University of Oxford)
Computational mechanisms underlying flexible decision-making via instant
decomposition

5:30   **EPS business meeting**
Samuel Alexander Lecture Theatre

Twenty Sixth EPS Prize Lecture, Samuel Alexander Lecture Theatre:

6:00   **Dr Richard Cook** (Birkbeck University of London)
              What kind of deficit causes developmental prosopagnosia?

8:00   **Conference dinner at Zouk**

Session A

Samuel Alexander Lecture Theatre

9:00 **Anna Joyce[*] and Dagmara Dimitriou*** (Coventry University and University College London) (Sponsor: Gareth Gaskell)
Sleep and early cognitive development in children with and without Down syndrome

9:30 **Jade E Marsh*, Federica Biotti*, Richard Cook and Katie L H Gray** (University of Reading, City University of London and Birkbeck University of London)
Facial sex discrimination in developmental prosopagnosia

10:00 **Karen Lander, Rohab Shahid* and Nikita Cullinane*** (University of Manchester)
Individual variation, social skill and recognition memory for faces and objects

10:30 Tea and coffee

11:00 **Robin S S Kramer and Ellen M Gardner*** (University of Lincoln)
Revisiting facial trustworthiness and criminal sentencing: Judgements based on multiple photographs per identity

11:30 **Kay L Ritchie and Robin S S Kramer** (University of Lincoln)
Multiple-image arrays and averages in unfamiliar face matching

12:00 **Holger Wiese, Simone C Tüttenberg*, A Mike Burton and Andrew W Young** (Durham University and University of York)
The Sustained Familiarity Effect: A robust neural correlate of familiar face recognition

12:30 End of meeting

Session B

Lecture Theatre A101

9:00   **Gwijde Maegherman*, Patti Adank and Joseph T Devlin** (University College
London)
Neural correlates of speech motor imagery – evidence from lip and tongue TMS
studies

9:30   **Judith Bek*, Emma Gowen, Stefan Vogt, Trevor Crawford and
Ellen Poliakoff** (University of Manchester and Lancaster University)
Imitation in Parkinson's disease and ageing: comparing human movement and simple
cues using kinematic analysis and eye tracking

10:00   **Daniel Yon*, Vanessa Zainzinger*, Floris P de Lange*, Martin Eimer and
Clare Press** (Birkbeck University of London and Radboud University,
Netherlands)
Action biases perceptual decisions toward expected outcomes

10:30   Tea and coffee

11:00   **Luigi Tamè, Suzuki Limbu*, Rebecca Harlow*, Mita Parikh* and Matthew R Longo**
(University of Kent and Birkbeck University of London)
Tactile size constancy mechanisms are different for objects and points on the skin surface

11:30   **Nicholas Paul Holmes** (University of Nottingham)
Tickling the brain: Effects of transcranial magnetic stimulation (TMS) on tactile
perception

12:00   **Michellie L Young*, Melanie R Burke* and Donna M Lloyd** (University of
Leeds)
Attentional bias to itch-related images in clinical itch and healthy skin
populations

12:30   End of meeting

1. **Laura Ayravainen* and Nina Kazanina** (University of Bristol)
   Perceptual units in Mandarin Chinese

2. **Faye O Balcombe*, Timothy J Slattery and Sarah J White** (University of Leicester and Bournemouth University)
   Eye movement behaviour during reading: Effects of preceding text difficulty

3. **Tami Kalsi*, Kevin Paterson and Ruth Filik** (University of Nottingham and University of Leicester)
   Preserved syntactic processing in older adulthood: Evidence from eye-tracking during reading

4. **Hayley Barton* and Kevin Paterson** (University of Leicester)
   Error detection in reading: Do older adults use experience of language to their advantage?

5. **Martina De Lillo*, Victoria E A Brunsdon, Elisabeth E F Bradford, Matt Fysh* and Heather Ferguson** (University of Kent)
   Comparing real-time social interactions in young and old adults

6. **Jessica Dawson* and Tom Foulsham** (University of Essex)
   Does looking at the speaker depend on visual or auditory cues?

7. **Abbie Millett*, Antonia D'Souza* and Geoff Cole** (University of Essex)
   Does validity and visual barriers prevent spontaneous perspective taking?

8. **Hayley Shepherd*, Waltraud Stadler*, Ellen Poliakoff and Emma Gowen** (University of Manchester and Technical University of Munich, Germany)
   Investigating action prediction in autistic adults

9. **Emma Gowen, Sonja Kotz*, Stephanie Baines* and Ellen Poliakoff** (University of Manchester, Maastricht University, Netherlands and Bangor University)
   Testing motor-sensory predictions in autistic adults

10. **Alice Pailhèsc*, Alexandre Pascual* and Gustav Kuhn** (Goldsmiths University of London and Université de Bordeaux, France)
    I know who you are! Social influence on sensitivity to subtle factors, using magicians forcing techniques

11. **Ruth Knight*, Mark Carey* and Catherine Preston** (University of York)
    Do selfies make you look slimmer? Investigating weight and aesthetic evaluations of social media style images

12. **Ashleigh Bellard*, Piers Cornelissen* and Valentina Cazzato** (Liverpool John Moores University and Northumbria University)
Multidimensional body image assessment in young and middle-aged women

13. **Samantha Keenaghan*, Marie Polaskova*, Gamze Gul*, Simon Thurlbeck* and Dorothy Cowie** (Durham University)
Alice in Wonderland: The effect of visuomotor synchrony and body size on children's bodily awareness and perception

14. **Inês Mares*, Louise Ewing, Emily K Farran, Fraser W Smith* and Marie Smith*** (Birkbeck University of London, University of East Anglia and University of Surrey)
Maturation of face sensitive abilities as revealed by EEG decoding

15. **Michael Papasavva*, Ines Mares*, Anne Richards, Louise Ewing and Marie L Smith*** (Birkbeck University of London and University of East Anglia)
Individual differences in face salience: clues from the unconscious

16. **Louise Ewing, Michael Papasavva*, Inês Mares*, Anne Richards and Marie L Smith*** (University of East Anglia and Birkbeck University of London)
How does face recognition memory ability relate to motivation to view faces?

17. **Marie L Smith*, Inês Mares*, Michael Papasavva*, Fraser W Smith* and Louise Ewing** (Birkbeck University of London and University of East Anglia)
Face recognition ability is manifest in the decoding of face-orientation selectivity from EEG

18. **Andrea Hildebrandt*, Matt Fish*, Natalie W Gentry*, Sarah Bate and Markus Bindemann** (Carl von Ossietzky Universität Oldenburg, Germany, University of Kent and Bournemouth University)
The psychometric structure and nomological net of face-matching ability

19. **Nadine Lavan* and Carolyn McGettigan** (University College London and Royal Holloway University of London)
No clear advantage for high variability training during voice identity learning

20. **Emily A Williams*, Elena Solodow*, Jessica Henderson*, Andrew Stewart and Luke Jones** (University of Manchester and Liverpool John Moores University)
Do click trains dilate time perception due to physiological arousal?

21. **Rona D Linklater*, Jeannie Judge and John E Marsh** (University of Central Lancashire) Distracter familiarity produces auditory distraction through attentional diversion in short-term memory

How does temperature affect behaviour? A meta-analysis of effects in experimental studies

Dermot Lynott[1], Katherine Corker[2], Louise Connell[1] and Kerry O'Brien[3]
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[2] Grand Valley State University, USA
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The surrounding environment has a profound impact on human behaviour. Research from field and population-based studies have shown repeatedly that higher temperatures are associated with increases in antisocial behaviours, including aggressive, violent, or sabotaging behaviours. More recently, experimental studies from a social cognitive perspective have revealed patterns linking higher temperature experiences to increases in prosocial behaviours, such as altruistic, sharing or co-operative behaviours. However, in both domains, studies have failed to replicate key temperature-behaviour predictions, leaving the status of temperature-behaviour links unclear. Here we conduct a series of meta-analyses of available laboratory-based empirical studies that measure either prosocial (e.g., monetary reward, gift giving, helping behaviour) or antisocial (retaliatory behaviour, horn honking, sabotage) outcomes, with temperature as an independent variable. Overall, we found that there was no reliable effect of temperature on the behavioural outcomes measured. In follow-up analyses, there was no reliable effect of temperature on prosocial or antisocial outcomes when analysed separately. We consider why the evidence to support temperature-behaviour links from laboratory-based studies is weak, examine potential moderating factors, and look at how future studies can attempt to reconcile seemingly contradictory patterns between experimental work and field/population-based studies.

Impaired sensitivity of older adults to the spatial configuration of faces and houses

(Substitution Talk - In place of Wolohan et al)
James Chard, Richard Cook and Clare Press
Birkbeck University of London
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Studies have found age-related deficits in a range of tasks with faces, including identity and emotion recognition. It is unclear what underlies observed atypicalities, and why older adults are unaffected in other apparently similar perceptual tasks. The present study examined the possibility that selective deficits in configural processing impair the perception of faces in healthy aging; a pattern that has often been proposed to underlie face processing difficulties in autism and developmental prosopagnosia. We used a signal detection paradigm, requiring a group of healthy older adults and matched younger controls to detect changes in images of faces that could differ either at the local, featural level, or in configuration of these features. In support of our hypothesis, older adults were particularly impaired in detecting configural changes, relative to detecting changes in features. Drift diffusion modelling confirmed that this related to reduced evidence accumulation rather than a tendency to make configural judgements based on less evidence. The impairments were found for both upright and inverted faces, and were similar in a task with

images of houses. These findings suggest that domain-general problems processing configural information may contribute to the pattern of face processing deficits observed in healthy aging.

Testing self-bias across different cognitive domains

Annabel D Nijhof [1], Caroline Catmur[1] and Geoffrey Bird[1, 2]
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It is widely acknowledged that humans have a strong egocentric bias. This view is based on findings indicating that we process self-related stimuli in a specialised, preferential manner. Although the phenomenon of self-bias is widely studied, at the same time it is highly fractionated: different aspects of self-processing are usually studied in isolation. As a consequence, the relationship between self-biases across different domains is currently unknown. Furthermore, due to methodological issues, it is not always clear whether self-related processing benefits are indeed self-related, or are instead caused by other factors such as familiarity.

Here, 54 participants performed two well-established tasks for measuring self-bias: an Attentional Blink task (attentional domain) and a Shape Matching task (perceptual domain). Comparing the processing of the participant's own name to names of close and unfamiliar others, we found strong evidence of a self-specific bias on both tasks. However, self-bias estimates were found to be unrelated across the two tasks. This calls into question the idea of 'self-bias' as a singular concept that is consistent across cognitive domains. Further, these findings could have consequences for models of atypical self-processing, such as those suggested for individuals with Autism Spectrum Disorder.

An investigation of the relationship between empathy and gestures

Paraskevi Argyriou[1] and Marie Levorsen[2]
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The ability to take the perspective of others and relate to their experiences (i.e., empathy) is crucial for social interactions. Research suggests that empathic ability may be associated with the way we move our bodies, and more specifically, with the size of the hand movements we produce whilst talking (i.e., gesture salience). Chu et al. (2014) found that speakers with higher levels of empathy produce larger gestures than speakers with lower levels of empathy, because they consider others' feelings and understanding. In this study we investigated whether producing large gestures may enhance one's own empathic ability. Participants completed an adapted version of the Multifaceted Empathy Test (Dziobek et al., 2008). They were presented with a series of pictures depicting people in emotionally charged situations. Whilst gesturing, they inferred and described the mental states of the individuals in the pictures. Gesture size was experimentally

manipulated (e.g., arms on the table allowing small gestural movements with palms/fingers; arms free allowing large gestural movements with elbows/shoulders). Next, participants rated their empathic reactions in response to the pictures. We found that large gestures increased empathic ratings, pointing towards the use of gestures in interventions aimed to boost empathic skills (e.g., in healthcare professions).

Chu, M., Meyer, A., Foulkes, L. & Kita, S. (2014). Individual differences in frequency and saliency of speech-accompanying gestures: the role of cognitive abilities and empathy. *Journal of Experimental Psychology General, 143*(2), 694-709.

Dziobek, I., Rogers, K., Fleck, S., Bahnemann, M., Heekeren, H.R., Wolf, O.T., Convit, A. (2008). Dissociation of Cognitive and Emotional Empathy in Adults with Asperger Syndrome Using the Multifaceted Empathy Test (MET). *Journal of Autism and Developmental Disorders, 38*, 464-473.

Social mechanisms affect perspective taking when reasoning about mirrors

Alessandro Soranzo[1] and Marco Bertamini[2]
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Perspective taking abilities can be studied by asking people to judge what is visible from a given viewpoint. When this task includes a mirror, performance is particularly poor: People overestimate what is visible and do not take viewpoint properly into account. We used a map of a room with a mirror on a wall and objects on the opposite side. Participants selected the visible objects. To test the effect of social perspective-taking, we divided the sample. For one group the viewpoint was that one of a person; for the other it was a camera. Results confirmed a bias to ignore the viewpoint, stronger for the camera, suggesting that social mechanisms (related to Theory of Mind) may be involved. To further explore the role of social mechanisms, we used a similar paradigm and compared typically developed (TD) 8-11 years old children (N=30), children of the same age with diagnosis of Autism Spectrum Disorder (ASD) (n=30) and adults (18+) (N=60). Performance was similar for TD children and adults. However, TD outperformed ASD children but only with respect to the role of the viewpoint: the ASD group tended to give less weight to the viewpoint, supporting the involvement of social mechanisms.

Online integration of speaker and meaning during language comprehension in autism spectrum disorder: Evidence from eye-tracking and ERPs

Mahsa Barzy, Jo Black, David Williams and Heather J Ferguson
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Typically developing individuals rapidly integrate information about a speaker and their intended meaning while processing sentences online. We examined whether the same processes are activated in adults with autism spectrum disorder, and tested their timecourse in two pre-registered experiments. Experiment 1 employed the visual world paradigm, where participants listened to sentences where the speaker's voice and message were either consistent or inconsistent, and concurrently viewed visual scenes including consistent and inconsistent objects. All participants were slower to select the mentioned object in the inconsistent condition. Importantly, eye-movements showed a visual bias towards the voice-consistent object, well before hearing the disambiguating word, showing that adults with ASD rapidly use the speaker's voice to anticipate the intended meaning. However, this target bias emerged earlier in the TD group (2240ms) compared to the ASD group (1800ms). Experiment 2 recorded ERPs to explore speaker-meaning integration processes. Participants listened to sentences as described above, and ERPs were time-locked to the onset of the target word. A control condition included a semantic anomaly. Results revealed an enhanced N400 for inconsistent speaker-meaning sentences, comparable to anomalous sentences, in both groups. Overall, contrary to the pragmatic dysfunction proposal, people with ASD were comparably sensitive to speaker-meaning inconsistency effects.

Attentional inertia: An effect limited to a viewer-centred frame of reference?

Catherine Thompson[1], Maryam Jalali[1] and Peter Hills[2]
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Attentional inertia is the persistence of top-down attentional settings from a task in which they are relevant to a task in which they are no longer relevant, influencing the allocation of visual attention and performance in the second task. Studies that support the effect are limited as they present tasks to the same spatial location, encouraging a viewer-centred frame of reference. It has been proposed that in dynamic tasks observers will adopt an environment-centred frame of reference, allowing them to switch attentional settings as necessary. To explore this, participants were asked to complete two tasks presented in different spatial locations. The primary task involved monitoring driving clips for hazards and the secondary task was a game that elicited a horizontal, vertical, or random spread of search. Participants were prompted to switch between the two tasks and eye-movements to the clips were compared based on the layout of stimuli in the preceding secondary task. Spread of search did not vary with the secondary task, providing no support for the persistence of attentional settings. The findings indicate that observers will adopt the most suitable frame of reference in each situation and consequently attentional inertia may have limited impact in dynamic, real-world tasks.

Spatial stability and cue type do not influence blocking in spatial learning

Anthony McGregor[1], Adina Lew[2] and Matthew G Buckley[1, 3]
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Some theories of spatial learning predict associative rules apply under only limited circumstances. Doeller & Burgess (2008) claimed that cue type (boundary or landmark) is a critical variable in forming a non-associative cognitive map, while O'Keefe & Nadel (1978) claimed cue stability was the critical variable. We manipulated stability of boundary and landmark cues when learning the locations of two hidden goals, one relative to the boundary, and one relative to landmark cues. Landmarks were unstable relative to the boundary for one group; for the other the boundary was unstable relative to landmarks. In a second stage all cues remained stable so that both goal locations could be learned with respect to both cue types. For the cue type hypothesis, boundaries should block learning about landmarks regardless of cue stability. But the cue stability hypothesis predicts that landmarks should block learning about the boundary when the landmarks appear stable relative to the boundary. Regardless of cue type or stability the results showed reciprocal blocking, contrary to both theories of spatial learning. The results were, however, consistent with an associative analysis of spatial learning.

Delayed consequences lead to habits

Gonzalo Urcelay[1], Selina Chadha[1] and Omar Perez[2]
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Different variables can determine whether instrumental behaviour is goal-directed or habitual. The most often documented are amount of training, schedules of reinforcement, the use of choice procedures. Other variables such as exposure to stress or drugs of abuse also facilitate habits. We will present data from rodents and humans showing that delayed consequences facilitate habit formation. Rats were trained for 6 days using a FR1 schedule with pellets presented immediately or 20 sec after a lever press. We devalued the outcomes by satiating animals and observed that more devaluation with immediate rather than delayed rewards. In humans, we developed a novel task in which participants purchased shares of different companies, with the feedback of each purchase being presented immediately after pressing a key, or 5 sec later. In a subsequent stage, we revalued the companies by informing participants that the company had crashed (or was doing better). Participants were tested on extinction. Again, we observed significant revaluation with immediate outcomes, but not (i.e., habits) when these were delayed.

Metacognitive differences are neither necessary nor sufficient for the Dunning-Kruger Effect

Robert D McIntosh, Elizabeth A Fowler, Tianjiao Lyu and Sergio Della Sala
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The Dunning-Kruger effect (DKE) denotes the finding that, for a wide range of intellectual tasks, poor performers greatly overestimate their ability, while top performers make more accurate self-assessments. A popular account of the DKE involves the idea that metacognitive insight requires the same skills as task performance, so that unskilled people perform poorly and lack insight. We tested whether the DKE is also found in more simple movement and memory tasks: pointing at a dot, or recalling its position after a delay. We asked participants to estimate their success or failure on every single trial, and we used psychophysical methods to extract measures of metacognitive sensitivity and calibration. The DKE pattern was obtained for both tasks, but metacognitive factors accounted for a minor part of the classic effect. The major driver of the DKE was the level of task performance. A simple statistical model of these findings shows that metacognitive differences can contribute to the DKE, but that they are neither necessary nor sufficient for it. Our data are from simple movement and memory tasks, but we suggest that our conclusions may be widely applicable.

A retrieved context model reveals drivers of the emotional oddball effect

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The emotional oddball effect is obtained in experiments where participants study lists of neutral items, as well as lists of neutral items and a single emotional "oddball" item. An oddball is recalled extremely well, while memory for surrounding items suffers, and effect referred to as retrograde and anterograde amnesia, respectively. Both aspects of the emotional oddball effect challenge retrieved-context theory. This is problematic given the large amount of empirical data that supports this theory. In this investigation, we report a solution for this discrepancy. Our variant of retrieved-context theory, called the emotional context maintenance and retrieval model (eCMR), was designed to examine the effects of emotion on memory. We examined whether a change in semantic organisation, attention, or surprise best account for the effect. In simulations, we found that semantic organisation had only a limited effect that did not dissociate oddball and standards. Attention modulated oddball memory, but not its amnestic effects. The traditional emotional oddball effect only emerged when we assumed that the switch between an emotional and a neutral context results in a drift in the temporal context. Our simulations corroborate retrieved-context theory and make novel predictions that we are currently testing.

Temporal difference thresholds and repetitive stimulation: Can click trains improve temporal sensitivity?

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Trains of auditory clicks increase subsequent judgements of stimulus duration by approximately 10%. Scalar timing theory (STT) suggests this is due to a 10% increase in pacemaker rate, a main component of the internal clock. This effect has been demonstrated in many timing tasks, including verbal estimation, temporal generalisation, and temporal bisection. However, the effect of click trains has yet to be examined on temporal sensitivity. We sought to investigate this both experimentally; where we found no significant increase in temporal sensitivity, and computationally; by modelling the temporal difference threshold task according to STT. Our experimental null result presented three possibilities, which we investigated by simulating a 10% increase in pacemaker rate in a newly created STT model of thresholds. We found that a 10% increase in pacemaker rate leads to a significant improvement in temporal sensitivity in 8.66% of 10,000 simulations. When a 74% increase in pacemaker rate was modelled to simulate the filled-duration illusion, temporal sensitivity was significantly improved in 55.36% of simulations. Therefore STT does predict improved temporal sensitivity for a faster pacemaker, but the effect of click trains appears to be too small to be reliably found in a temporal difference threshold task.

Symposium -   **Characterising motor imagery**
Organised by Ellen Poliakoff

Motor imagery during action observation: strengths, opportunities, weaknesses, and threats

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This talk aims to contribute to the integration of research on action observation (AO), motor imagery (MI), and cognitive control (CC). In the neuroimaging literature, AO is often primarily construed as bottom-up information uptake. I will discuss several lines of evidence that challenge this view: First, in neuroimaging studies on imitation learning, we have repeatedly shown that during observation of novel actions, two key brain structures of CC become activated, namely dorsolateral prefrontal cortex and medial frontal cortex (Buccino et al. 2004; Vogt, et al. 2007; Sakreida et al. 2018). These findings point to the relevance of CC operations during AO. Second, there is now robust evidence that participants can concurrently engage in AO and MI ('AO+MI', Vogt et al., 2013), where the imagined action can either coincide or complement the observed action (e.g., observed attack and self defense action). Here, coordinating and attenuating the AO- and MI-related motor simulation processes is a further potential role for CC (Eaves et al., 2016). Based on the available evidence from neuroimaging research, I will present a coherent framework for the various functions of CC in AO, MI, and AO+MI processes and highlight the strengths and opportunities of related future research.

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Motor imagery, embodiment and gender

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In the hand laterality task, participants judge the handedness of visually presented stimuli – images of hands shown in a variety if postures and views – and indicate whether they perceive a right or left hand. The task engages kinesthetic and sensorimotor processes and is considered a standard example of motor imagery. We recently compared the performance of male and female participants on a mental rotation variant of the hand laterality task and on a mental rotation task using Shepard-Metzler style cube figures, supplementing chronometric data with a physiological metric of 'cognitive effort', pupil diameter. Differences in RT between the sexes were slight for the cubes task, while females were consistently faster than males on the hands task. In contrast, pupillometry revealed striking a sex difference, with males showing significantly lower pupil dilation during the cubes task, suggesting less cognitive effort for comparable behavioural performance. This difference was attenuated during the mental rotation of hands, with females attaining faster reaction times with comparable cognitive effort. These results are discussed with reference to recent findings that sex differences in quite disparate spatial abilities dissipate when elements of social perspective taking are introduced.

Motor imagery and inhibition in task switching

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Motor imagery (MI) requires the covert execution of a movement without any overt motor output. Overt movements during MI are supposed to be mainly avoided through the inhibition of motor commands. While previous research has highlighted positive effects of MI for training and optimizing motor skills, its effects on cognitive processes are yet to be thoroughly investigated. By combining MI with different versions of the task switching paradigm, which is widely used to study flexible control of behavior, the influence of MI on cognitive inhibition can be assessed. By measuring n – 2 repetition costs as a proxy for task set inhibition, an interaction of motor inhibition (as triggered during MI) and cognitive inhibition (as measured by n – 2 repetition costs) was found: for covert responses in trial n, n – 2 repetition costs were absent while they were present for overt responses. After covert responses in trial n – 1, on the contrary, n – 2 repetition costs were larger compared to overt responses. This suggests that MI can affect cognition beyond motor-related processes.

Instructions to attend to an observed action increases imitation in autistic adults

(Substitution Talk - In place of Wriessnegger et al)
Emma Gowen, Andrius Vabalas, Alexander J. Casson, Ellen Poliakoff

University of Manchester

Voluntary imitation, the ability to purposefully copy another person's actions is essential for learning new actions from others and facilitating interpersonal interactions. Accumulating evidence shows reduced accuracy of imitation in autistic children and adults. For example, autistic individuals modulate the vertical amplitude of their movement less than non-autistic individuals when imitating movements of different heights. Here, we investigated whether reduced visual attention to the observed action might account for altered imitation in autistic adults. We compared general instructions to "copy the action" with explicit instructions asking participants to attend to the height of the observed action. 22 autistic and 22 non-autistic participants observed, then imitated sequences of hand movements that varied in vertical amplitude during a general and explicit instruction block while their eye and hand movements were tracked. Imitation was measured by the degree to which participants modulated their movements between the different heights of the observed movements. Explicit instructions increased modulation in the autistic group to levels that were similar to the non-autistic group. Additionally, the autistic group spent significantly less time looking at the hand movement across conditions. These findings suggest that altered attention to the observed action contributes to differences in imitation in autism.

Disentangling motor imagery and motor execution in normal and pathological conditions

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In the present talk, I will describe a series of experiments, in both normal and pathological conditions, where motor execution (ME) and motor imagery (MI) are functionally disentangled. In healthy subjects, by capitalizing on bimanual coupling and intermanual transfer mechanisms, we showed that during MI the observed effects are dramatically reduced comparted to ME. The same tasks were used in brain-damaged patients with anosognosia for hemiplegia, who deny their motor deficit and believe they can still move the paralyzed limb, and in amputees with phantom limb syndrome, who reported kinematic sensations on their phantom. In both pathological contexts, we discriminated between the patients' illusory motor experience, which was able to induce effects comparable to that evident in real movements, and a mere imagery, which was not. Finally, we investigated the controversial role of the primary motor cortex (M1) during MI by using TMS in healthy subjects. By manipulating the instructions given to the subjects, we found either facilitation or inhibition on M1, depending on whether an action should be performed (as in ME) or suppressed (as in MI). Starting from these findings, differences between MI and ME will be discussed from a theoretical and methodological point of view.

Neural correlates of motor imagery, action observation, and movement execution: A comparison across meta-analyses

Thursday 11 April, am

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Theories of 'functional equivalence' propose that the mental simulation of action, through motor imagery or action observation, recruits the same brain regions in a similar fashion (Crammond 1997, Grezes & Decety, 2001, Jeannerod 2001). Though there is extensive empirical research examining the mental simulation of action, their results had not been examined via a quantitative synthesis that directly compared these representations of action. In a recent paper (Hardwick, Caspers, Eickhoff, and Swinnen, 2018) we conducted quantitative meta-analyses of neuroimaging experiments examining Motor Imagery (303 experiments, 4902 participants), Action Observation (595 experiments, 11,032 participants), and corresponding tasks using Movement Execution (142 experiments, 2302 participants). Results indicated that Motor Imagery and Action Observation recruited similar premotor-parietal networks. However, Motor Imagery and Movement Execution consistently recruited subcortical and cerebellar regions, while there was no similar subcortical recruitment during Action Observation. These data quantify the brain networks involved in action simulation, and highlight key differences in the way they recruit motor cortex, parietal cortex, and subcortical structures. Our results challenge current models of the 'functional equivalence' between simulated and executed actions, and illustrate the pressing need to develop alternative models (e.g. Glover & Baran, 2017) of how action simulation relates to action execution.

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End of Symposium

An ERP priming effect reveals independence of the extrastriate symmetry code

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Visual symmetry is used by many animals to guide object recognition and mate selection. In recent decades the neural basis of symmetry perception in humans has been investigated. Different kinds of visual symmetry (e.g. reflection, rotation and repetition) generate an event related potential component called the Sustained Posterior Negativity' (SPN). However, it is unclear whether different symmetry types are extracted from the image by different visual integration mechanisms, or whether there is a common mechanism for all types. We developed a priming paradigm to answer this question. Experiment 1 found that successive presentation of three different symmetrical exemplars caused SPN amplitude to increase. We term this effect SPN priming. Subsequent experiments found no SPN priming for sequences mixing reflection and rotational symmetry, non-orthogonal axis orientations, or images at different retinal locations. We conclude that different symmetry types are coded by independent integration mechanisms in the extrastriate visual cortex. However, SPN priming did survive orthogonal changes in axis orientation (i.e. horizontal to vertical or vice versa). This confirms the special relationship between orthogonal axes.

Amodal representation of symmetry in the brain: an EEG/ERP evidence

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The extra-striate visual areas are highly sensitive to symmetry, and this sensitivity increases proportionally with saliency. Moreover, this network can overcome visual distortions that affect regularity (i.e. perspective projections, dynamic integration of parts), and achieve a representation of object's symmetry . This ERP study ads to this literature by investigating the (history-dependent) amodal representation of half-occluded objects. An unfamiliar shape (symmetric or asymmetric) appeared for 250ms at fixation flanked by two bars. One of the two bars moved, covered the shape entirely for 250ms, then shifted slightly back again revealing half of the shape underneath. Participants' task was to report whether the shape was same as the first (fully visible) shape or had changed (different). Note that symmetry was task-irrelevant. Performance accuracy was $\geq 80\%$. There was a symmetry-related ERP response over the extra-striate visual region, indicating that amodal representation of symmetry was generated (after the experience of seeing the fully-visible symmetric shape). In another study, the same/different judgement was based on colour; no amodal representation of symmetry was recorded, showing that global shape processing is necessary for this ERP component.

Expectation modulates memory experience at retrieval: Behavioural and EEG evidence

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We investigated how contextual expectation modulates the brain activity related to different

memory outcomes. We have previously shown (Kafkas & Montaldi, 2018) that expectations formed within a retrieval context have an effect on recognition memory performance. In the present study, we further explored this effect using electroencephalography (EEG). In a rule-learning task participants learned contingency relationships between 6 different symbols and the type of stimulus that followed each one. At retrieval, the established relationship was violated for a subset of stimuli resulting in the presentation of both expected and unexpected stimuli. We replicated our previous finding that the expectation status of the stimuli has opposite effects on familiarity and recollection – the two kinds of memory that support recognition memory decisions. Expected stimuli were more likely to be deemed familiar than unexpected stimuli, whereas unexpected stimuli were more likely to be recollected than were expected stimuli. We further showed that ERP components linked to these two kinds of memory are modulated by the expectation manipulation. The findings provide new insights into the mechanisms that determine the kind of memory experience at retrieval and have implications for the role of context in memory decisions.

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Why knowing the orientation of the target only helps when visual search is difficult

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The dominant theories of visual search envisage search as a process that compares individual items against a target description based on the properties of the target in isolation. Here, we present four experiments that demonstrate this only holds true in difficult search. In easier search the relation with neighbouring items seems part of the target description as well.

We used two sets of oriented lines to construct search items. The vertical set contained horizontal and vertical lines, the diagonal set contained left and right diagonal lines. Participants always knew the target's identity and the line set used to construct it. In difficult search this knowledge allowed improved performance when only half of the search items came from the same line set as the target (50% eligibility), relative to when all items did (100% eligibility). However, in easier search, performance was actually poorer for 50% eligibility, especially on target-absent trials.

This negative influence of ineligible items in easier search is hard to reconcile with theories based on individual items. It is more in line with theories that conceive search as a sequence of fixations where the number of items processed during a fixation depends on the difficulty of the search task.

Number writing and its relationship with arithmetic: does number word inversion matter?

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The ability to translate accurately and efficiently between Arabic digits and spoken number words is important for mathematical development. However, few studies have investigated whether differences in number word structure between languages might influence transcoding ability and further, how it relates to mathematics performance. This talk will describe findings from a large longitudinal study with two samples of primary-school children from Austria and the UK. These languages provide a useful comparison as in English number words the order of tens and units (e.g., forty-two) follows the written order of the Arabic digits (e.g., 42), whereas in German number words are inverted (e.g., two and forty). As part of a larger battery of assessments, children were required to write single and multi-digit numbers from dictation. Results revealed some notable differences across language groups. For example, as predicted, German-speaking children made significantly more errors transcoding double-digit numbers compared to the English-speaking children. However, English-speaking children made more errors writing teens, which are exceptional in English because of their inverted structure. Despite such group differences, there were clear concurrent and longitudinal relationships between arithmetic and transcoding ability in both language groups, even when controlling for a range of domain-general and other domain-specific measures.

Parafoveal pre-processing in English children: The importance of external letters

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Although previous research has demonstrated that for adults external letters of words are more important than internal letters for lexical processing during reading, no comparable research has been conducted with children. This experiment explored, using the boundary paradigm during silent sentence reading, whether parafoveal pre-processing in English is more affected by the manipulation of external letters or internal letters, and whether this differs between skilled adult and beginner child readers. Six previews were generated: identity (e.g., monkey); the beginning three letters of the word substituted (external orthographic manipulation; e.g., rackey); the middle three letters of the word substituted (internal orthographic and phonological manipulations; e.g., machey, mochiy); the end three letters of the word substituted (external orthographic manipulation; e.g., monhig); and a control condition (e.g., rachig). Results indicate that both adults and children undertook pre-processing of words in their entirety in the parafovea, and that the manipulation of external letters in preview was more harmful to participants' parafoveal pre- processing than internal letters. These results not only provide further evidence for the importance of external letters to parafoveal processing and lexical identification for adults, but also demonstrate that such findings can be extended to children.

Symposium -   **Individual differences in face processing**
Organised by Katie Gray

Putting individual differences in face processing ability under the microscope: commonalities in performance across multiple tasks

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Unfamiliar face processing ability varies considerably in the population. However, the means of its assessment is not standardised, and selected laboratory tests vary between studies. It is also unclear whether the most commonly employed tasks measure one underlying ability and whether they can reliably predict performance on other tests. For example, in studies with so-called super-recognisers the Cambridge Face Memory Test + and the Glasgow Face Matching Task are frequently used to predict high ability on other simultaneous 2AFC tasks or the 1-in-10 test. To assess the assumption that these tests are underpinned by one ability and thus performance on one test can be predictive of others, we asked participants to perform eight tasks commonly employed in the individual differences literature. First, we used Principal Component Analysis to examine the shared variance as a proxy for underlying face processing ability and the extent to which these tasks correlate. Second, we calculated estimates of the expected correlations between the tests. Finally we performed single item analysis to investigate how performance can vary due to individual item difficulty and sampling noise. We discuss the results in the context of current assessment methods of individual differences in unfamiliar face recognition ability.

Emotion recognition in autism: evidence for typical integration of emotion cues

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Research suggests that many autistic individuals struggle to recognise others' emotions from the face and body. It is also often suggested that those with autism do not integrate emotional cues within faces, or across faces and bodies, to a typical extent, owing to reduced holistic processing. This talk presents two studies investigating integration of emotion cues in autistic adults. The first study investigated the extent to which body context influences perception of facial emotion, and found that the autistic and neurotypical groups were similarly susceptible to influences of body context. However, individuals with less precise recognition of facial emotion were influenced to a

greater extent by emotion cues from the body. The second study investigated the effect of emotion on the composite face effect and found that autistic individuals exhibited greater composite effects when distractor face halves included stronger emotion cues, in a similar way to neurotypical individuals. Taken together, these studies suggest that autistic individuals are able to integrate emotional cues typically across disparate facial and bodily regions in a typical way.

How face-specific is developmental prosopagnosia?

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Individuals with developmental prosopagnosia (DP) show severe face recognition deficits that typically emerge in early childhood, without any apparent neurological damage. An issue that is currently under intense discussion is the degree to which visual object recognition impairments in DP are genuinely face-specific (e.g., Geskin & Behrmann, 2018). This talk will briefly review the current state of this debate. We will then present recent data from EEG-based experiments that measured steady-state visual evoked potentials (SSVEPs) to gain insights into the identity-related visual processing of faces and objects, and how these differ between DPs and unimpaired age-matched control participants. Using identity oddball procedures (Liu-Shang et al., 2014), we found that relative to controls, DPs showed attenuated SSVEP responses to face identity changes, suggesting an early deficit in the processing of identity-related visual signals from faces. Importantly, similar SSVEP differences between DPs and controls were also found in other identity oddball tasks where non-face objects (cars) were shown. These results suggest that deficits in the perceptual analysis of visual information about object identity in DP are not fully face-selective. Possible mechanisms involved in this apparently generic impairment of identity processing in DP will be briefly discussed.

Large sample studies of developmental prosopagnosia

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Developmental prosopagnosia (DP) is a neurodevelopmental disorder defined by lifelong deficits in face recognition despite otherwise normal vision and cognition. DP research has made considerable progress in recent decades, but key issues remain unsettled. In this talk I will share several large sample studies that address some of these issues, including face specificity of DP, facial identity vs facial expression processing in DP, and holistic face perception in DP. Each study tested 100+ DPs, producing large amounts of data that generate more decisive answers and more precise estimates. The data also enable us to fractionate DP at higher resolution and look for novel directions for future research.

The contribution of face-selective mechanisms and general cognitive abilities to individual differences in children's face recognition abilities

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Accurate face identity recognition is crucial to social functioning yet this ability varies among typical adults and children. In adults, this variation reflects the strength of face-selective perceptual mechanisms, with only small contributions from more general cognitive abilities. However, little is known about individual differences in face recognition abilities in children. Face recognition skills improve during childhood yet children use the same face-sensitive mechanisms as adults, suggesting that variation in these mechanisms may also contribute to children's face recognition abilities. We examined the contributions of holistic coding (information is integrated across a face) and adaptive norm-based coding (faces are coded in face-space relative to a norm that is updated by experience), along with general cognitive abilities, to individual differences in face recognition ability in 147 children aged 6–9 years. Both adaptive and holistic coding were associated with both face perception ability, when age and sex were controlled for. Cognitive ability was not associated with face ability, when age was controlled for. These results suggest that face recognition ability in childhood primarily reflects variation in face-sensitive mechanisms and is consistent with a view that face recognition ability is a specific ability that may reflect a substantial genetic contribution.

Training face perception in developmental and acquired prosopagnosia

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Despite the large number of studies on prosopagnosia, there have been few attempts at rehabilitation. Here, we determine whether perceptual learning can be used in the rehabilitation of developmental and acquired prosopagnosia. Further, we investigate changes in functional connectivity between face-selective regions as a function of training. Ten developmental and 10 acquired prosopagnosics completed a 12-week face training program and a 12-week control task. Participants were presented with 3 faces and were asked to determine which of the bottom two faces most resembled the top face. A staircase procedure was used to keep training near their individual perceptual threshold. To promote ecological validity, training progressed from neutral faces in frontal view through increasing variations in viewpoint and expression. Following

training, we observed an improvement on trained faces, as well as for new untrained expressions and viewpoints, and some generalization to new face identities. Further, we found increased functional connectivity between several face-selective regions following training. In summary, perceptual learning may be a useful tool for improving face recognition in developmental and acquired prosopagnosia.

End of Symposium

Working memory for object concepts relies on both linguistic and simulation information

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The linguistic-simulation approach to cognition predicts that language can enable more efficient conceptual processing than sensorimotor-affective simulations of concepts. We proposed that this perspective has implications for working memory, whereby use of linguistic labels enables more efficient representation of concepts in a limited-capacity store than representation via full sensorimotor simulation. In two pre-registered experiments, we asked people to remember sequences of real-world objects, and used articulatory suppression to selectively block access to linguistic information, which we predicted would impair accuracy and latency of performance in an object memory recognition task. We found that blocking access to language at encoding impaired memory performance, but blocking access at retrieval unexpectedly facilitated speed of responding. These results suggest that that working memory for object concepts normally relies on language but that people can flexibly adapt their memory strategies when language is unavailable. Moreover, our data suggest that a sequence of up to 10 object concepts can be held in working memory when relying on sensorimotor information alone, but this capacity increases when linguistic labels are available.

Linguistic distributional information and sensorimotor similarity both contribute to semantic category production

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The human conceptual system comprises linguistic and sensorimotor information, but the importance of each in conceptual processing is debated. We hypothesised that accessing semantic concepts during a category production task would rely on both types of information, but particularly on linguistic distributional information, which may provide a computationally cheaper shortcut. We tested this hypothesis in a pre-registered study of category production. For each named concept and its category, we calculated a measure of sensorimotor proximity (based on an 11-dimension representation of sensorimotor strength), and linguistic proximity (based on word co-occurrences derived from a large corpus). Both proximity measures predicted category

production (e.g., when asked to name FRUIT, responses were based on both the similarity of sensorimotor experience and how often the words shared linguistic contexts). Category production was better predicted when linguistic proximity was included in the model compared to sensorimotor proximity alone; however, linguistic proximity was more important for measures of frequency, while sensorimotor proximity was more important for ordinal rank, and neither proximity measure reliably predicted first response times. The findings suggest that both linguistic and sensorimotor information drive access to semantic concepts during category production, but that their relative importance depends on the measure of interest.

Sensorimotor and linguistic information contribute to the basic-level advantage in categorisation

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The basic-level advantage is one of the best-known effects in categorisation. The traditional explanation is that basic-level categories reflect a maximally-informative or entry level in the taxonomic organization of concepts into discrete levels in semantic memory.

However, such explanations are not fully compatible with recent advances in research into the structure of the conceptual system, which emphasise the dynamic roles of sensorimotor (i.e., perception-action experience of the world) and linguistic information (i.e., statistical distribution of words in language) in conceptual processing.

This pre-registered study examined RT and accuracy in a word→picture categorisation task. We hypothesised that measures of sensorimotor and linguistic distributional distance (e.g., between dog and Labrador) would contribute to categorical decision making, and would outperform traditional taxonomic levels (i.e., subordinate, basic, superordinate) in predicting the basic level advantage.

Results showed that, overall, sensorimotor and linguistic information explained the basic-level advantage at least as well as taxonomic level. Sensorimotor information best explained processing speed, whereas taxonomic level best explained participant's choices.

These findings suggest that the basic-level advantage may emerge on the fly, during categorical decisions, reflecting the extent to which sensorimotor and linguistic experience of a category-concept (e.g., dog) overlaps with that of a particular member-concept (e.g., Labrador).

Can experimental word learning measures predict real word vocabulary growth for children with English as an additional language (EAL)?

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Children with English as an additional language (EAL) understandably have reduced vocabulary knowledge in English, compared to monolingual peers. Vocabulary measures may

unfairly underestimate language skill in EAL children, as they are often standardized with a sample of monolingual children. A novel word learning task was used as a 'dynamic' assessment of word learning with 47 monolingual and 62 EAL children. A previous study (Gellert and Elbro, 2013) found phonological measures of word learning predicted vocabulary growth over novel word definition knowledge for Danish children. The current study measures children's static vocabulary (BPVS and CELF expressive score) at the time of novel word learning, and one year later. Phonological aspects of novel words (learning and recall scores) were a stronger predictor of English vocabulary growth than semantic aspects (ability to define novel word meanings) for EAL pupils. Monolingual children's vocabulary growth was not predicted by novel word learning ability. Thus, a dynamic assessment of vocabulary growth may successfully differentiate between EAL children whose vocabulary deficit is due to lack of exposure compared to EAL children who may have a language difficulty. The implications for developing vocabulary screening measuring dynamic language learning capacity will be considered

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Learning spoken words from context

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Acquiring new vocabulary in adulthood happens largely from context. The efficiency of contextual learning and the quality of lexical representations formed through it has been explored in the visual domain [1]. However, contextual learning in the auditory domain and the development of word form and word meaning representations in such settings have received little attention. Additionally, high language proficiency facilitates novel word acquisition [2,3], but the type of word learning facilitated and the source of this effect are still unclear.

To address these gaps in research, word learning was investigated in L2 learners with aurally presented sentences where novel word meanings were inferred from the context. Tests of lexicalization (i.e. integration of novel word representations into the mental lexicon) were administered immediately and 48 hours after learning. Explicit and implicit novel word knowledge was examined with a series of tasks, using behavioral and ERP measures of learning.

Lexicalization was found (indexed by N400) 48 hours after learning, whereas only novel word recognition accuracy varied as a function of L1. The findings contribute to the discussion of language proficiency effects in word learning and of how lexical representations develop from context.

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An ear and eye for language: Mechanisms underlying second language word learning

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To become fluent in a second language, learners need to acquire a large vocabulary. However, the cognitive and affective mechanisms that support word learning, particularly among second language learners, are only beginning to be understood. Rather, prior research has focused on explicit learning and small artificial lexicons. In two experiments investigating the sources of individual variability in word learning and their underlying mechanisms, participants explicitly and incidentally learned a large vocabulary of Welsh words (i.e., emulating word learning in the wild) and completed a large battery of cognitive and affective measures. The results showed that prior language knowledge, working memory, phonological abilities and orthographic abilities were all key predictors of word learning, but that these relationships also varied depending on the demands of the learning (e.g., explicit/incidental). We discuss these results in the context of the mechanisms that support both native and nonnative language learning.

Sleep and early cognitive development in children with and without Down syndrome

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In typically developing (TD) children, poor sleep contributes to cognitive difficulties. Children with Down syndrome (DS) have severe sleep problems, particularly sleep-disordered breathing, as well as cognitive and behavioural difficulties. This study explores, for the first time, associations between sleep and early cognitive development in pre-schoolers with DS.

Twenty-two children with DS and 22 TD children aged 2 to <5 years completed the Mullen Scales of Early Learning and underwent home cardiorespiratory polygraphy. Parents completed questionnaires on sleep, language and behaviour. Children with DS performed less well on each Mullen scale relative to TD children. Developmental trajectories indicated delayed and slower learning for fine motor, visual reception and expressive language skills in DS. Receptive language was delayed but showed a typical trajectory; thus should be recognised as a relative skill in DS that could aid learning in other areas. In TD children, there were clear associations between better sleep and improved language and behaviour. Findings were mixed for children with DS, likely because multiple factors in this complex syndrome mask or mediate associations between sleep and cognitive development. We recommend that sleep problems be screened and treated as even mild disruptions may prompt poorer cognition and behaviour.

Facial sex discrimination in developmental prosopagnosia

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Developmental prosopagnosia (DP) is a neurodevelopmental condition associated with difficulties recognising and distinguishing facial identities. It is currently debated whether DP is associated with deficits in processing other facial attributes, such as sex, as findings have been mixed. We tested 16 DPs on two sensitive sex categorisation tasks, comparing results to that of age- and gender-matched controls. In task one, trials presented faces drawn from a morph continuum blending an average male face with an average female face, and observers made a binary 'male'/'female' judgement. Psychometric functions were modelled using cumulative Gaussians. Results showed that judgement precision, inferred from the slope of each function, was significantly lower in the DP than the control group. In task two, female or male facial identities were blended with a weighted sex-neutral average face (20-80%, 30-70%, 40-60%, or 50-50%), thus varying task difficulty. Observers made a binary 'male'/'female' judgement. As expected, categorisation accuracy (d´) varied as a function of the strength of the sex signal. However, DPs

were significantly less sensitive than controls at all morph-levels, confirming that visual processing difficulties in DP can extend beyond the extraction of facial identity. Evidence of facial sex processing deficits accords with an apperceptive characterisation of DP.

Individual variation, social skill and recognition memory for faces and objects

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It is known that there is huge variation in individual face identification ability. For example in the Glasgow Face Matching Test (Burton, White, & McNeill, 2010), performance ranged from near chance to perfect. Interestingly, different aspects of personality and social skill have also been associated with face identification ability. For example, links have been made with anxiety, empathy, extraversion and social anxiety. In Experiment 1, we find a significant relationship between optimism, social anxiety and face recognition memory, with better memory associated with high optimism and low social anxiety. This effect is not found with object memory. In Experiment 2, we further find a correlation between altruism, empathy and face recognition. We consider the implications of our findings. Whilst previous work, including our own, investigates only a single or small number of personality traits, more consideration is needed to determine how these findings fit together into an integrative theory. In addition, the practical impact of individual variation in applied situations is considered.

Revisiting facial trustworthiness and criminal sentencing: Judgements based on multiple photographs per identity

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Studies in recent years have shown that a person's perceived trustworthiness, based on their facial appearance, can influence important real-world outcomes. For example, Wilson and Rule (2015) found that innocent people (later exonerated through the Innocence Project) who were rated as less trustworthy were more likely to have received a death (rather than life) sentence. Perhaps problematically, these ratings were based on a single, unstandardised photograph of each identity. As such, we question how representative these ratings were in comparison with the (supposedly influential) perceptions formed in court settings. Here, we collected ratings of the same innocent individuals, while including multiple images of each identity. Our results suggest that trait judgements produced by averaging ratings across several images of the same person may not be predictive of sentencing outcomes. We discuss this result within the context of real-world impression formation, within-person facial variability, and impression accuracy.

Multiple-image arrays and averages in unfamiliar face matching

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We know from previous research that unfamiliar face matching (determining whether two simultaneously-presented images show the same person or not) is very error-prone. A small number of studies in lab settings have shown that multiple instances or face averages can improve face matching performance. In addition, findings from the face learning literature have shown that exposure to a wider range of within-person variability can help with face learning. In eight experiments we investigate the effect of face averages and multiple-image arrays showing different levels of within-person variability on unfamiliar face matching. Six experiments were conducted in a lab setting, and two were live face matching tasks where participants compared an image, array, or average to a live person. We find no evidence of an average advantage for face matching, but some evidence for a benefit of multiple-image arrays over single images in sequential matching tasks. The results will be discussed in the context of face processing mechanisms.

The Sustained Familiarity Effect: A robust neural correlate of familiar face recognition

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Humans are remarkably accurate at recognizing familiar faces, even from novel pictures, while the recognition of unfamiliar faces is often error-prone. Researchers therefore propose image-independent representations for familiar but pictorial representations for unfamiliar faces. However, cognitive neuroscience has largely failed to show a robust neural correlate of image-independent familiar face recognition. Here, we examined event-related potentials elicited by highly personally familiar (close friends, relatives) and unfamiliar faces. We presented multiple "ambient" images per identity, varying naturally in lighting conditions, viewing angles etc. Familiar faces elicited a more negative N250 component (200–400 ms), reflecting the activation of stored representations. Importantly, an increased familiarity effect was observed in the subsequent 400-600 ms time range. This Sustained Familiarity Effect (SFE) was reliably detected in 84% of individual participants, but not observed in a control experiment with only unfamiliar faces. Moreover, while the N250 effect does not strongly depend on attentional resources, the SFE is substantially smaller when attention is directed away from the faces. We interpret the SFE as reflecting the integration of visual with additional person-related (e.g., semantic, affective) information needed to guide potential interactions. We propose that this integrative process is at the core of identifying a highly familiar person.

Neural correlates of speech motor imagery – evidence from lip and tongue TMS studies

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Motor imagery has been hypothesised to involve activation of motor cortex in the absence of executed movement. Past studies investigated the role of motor cortex in motor imagery for manual actions [1–3] and speech actions [4–7]. We conducted two experiments to investigate how speech imagery involves motor cortex during action execution, action perception, and imagery. We measured Motor Evoked Potentials (MEPs) from hand and lip muscles to establish the relative excitability of hand or lip motor cortex. Participants in experiment 1 performed a simple squeezing task. In the manual task they squeezed a pair of wooden pliers between their thumb and index finger, imagined squeezing the tweezers (imagery) or did nothing (baseline), and in the lip task they squeezed the tweezers, or imagined squeezing the tweezers, or did nothing. In experiment 2, participants produced a difficult consonant sequence (/tr/) listened to the sequence (auditory), or did nothing (baseline). Experiment 1 showed enhanced cortical excitability for action execution relative to baseline, but no imagery effects for hand or lip. The result from experiment 2 showed enhanced excitability for imagery relative to the auditory condition and baseline. Motor cortex involvement during imagery appears to be dependent on task complexity.

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Imitation in Parkinson's disease and ageing: Comparing human movement and simple cues using kinematic analysis and eye tracking

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Action observation and imitation activate neural structures involved in action execution and have been found to facilitate movement in Parkinson's disease (PD). However, simple visual cues can also elicit movement in PD, and action representation may be altered, with evidence suggesting an increased reliance on visual processing. It is therefore unclear whether action observation can exert a stronger influence on movement than simple visual cues.

Participants with mild to moderate PD (N=22) and age-matched controls (N=23) observed and imitated videos of high- or low-amplitude movement sequences depicted by a human hand or a simple shape. Hand kinematics were recorded and modulation of movement amplitude provided a measure of imitation. Eye movements were recorded to explore mechanisms during observation.

Although the PD group made slower and smaller movements, both groups exhibited increased modulation of movement amplitude when observing the human hand than with the simple cue. Participants made larger saccades and looked to the movement end-point later when watching the shape, suggesting that the hand was attended to more closely.

The results indicate that people with PD and older adults observe and imitate stimuli with a human appearance more closely than simple moving cues, supporting the use of action observation-based therapies.

Action biases perceptual decisions toward expected outcomes

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We predict how our actions will influence the world around us. Prevailing models of action control propose that we use these predictions to suppress or 'cancel' perception of expected action outcomes. However, contrasting normative Bayesian models in sensory cognition suggest that top-down predictions bias observers toward perceiving what they expect. Here we adjudicated between these models by investigating how expectations influence perceptual decisions about briefly presented action outcomes. In Experiment 1 participants executed finger movements and made detection judgements about rapidly presented and backwards-masked finger movements that were congruent or incongruent with their own actions. Contrary to dominant cancellation models, we found that observers' perceptual decisions are biased toward the presence of outcomes congruent

with their actions. Additional experiments revealed this bias is independent of top-down attention (Experiment 2) and is not driven by imperative cues (Experiment 3). Computational modelling of all experiments revealed this action-induced bias reflected a bias in how sensory evidence was accumulated, rather than a baseline shift in decision circuits. In combination, these results reveal a gain control mechanism that can explain how we generate largely veridical representations of our actions and their consequences in an inherently uncertain sensory world.

Tactile size constancy mechanisms are different for objects and points on the skin surface

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Several studies have shown the presence of large anisotropies for tactile distance perception across several parts of the body. Tactile distance between two touches on the dorsum of the hand is perceived as larger when they are oriented mediolaterally than proximodistally. This effect can be partially explained by a process of tactile size constancy. It is unknown whether the same kind of compensation is taking place also when objects size has to be estimated. We investigated whether tactile anisotropy that typically emerges when participants have to estimate the distance between two touches is also present when a continuous object touch the skin and participants have to estimate its size. In separate blocks, participants judged which of two tactile distances or objects on the dorsum of their hand felt larger. One stimulation was aligned with the proximodistal axis, the other with the mediolateral axis. Results showed that across distances were consistently perceived as larger than along ones, whereas the size of the objects was not. These results suggest that a processing of tactile size constancy is more effective when the tactile size of an object has to be estimated compared to when the distance between two touches has to be judged.

Tickling the brain: Effects of transcranial magnetic stimulation (TMS) on tactile perception

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Transcranial magnetic stimulation (TMS) has been used in cognitive neuroscience for decades. Great progress has been made in understanding the generation and control of movement by applying TMS over primary motor cortex. Much less work has used TMS over primary somatosensory cortex (S1). While S1 is an ideal candidate for TMS, fundamental methodological weaknesses have limited progress. To remedy this, systematic work is required to refine the experimental designs within which S1 can be targeted effectively by TMS. Important design parameters include the location, intensity, and protocol of the TMS itself, as well as some seemingly-obvious but often ignored psychological confounds. For example, TMS is quite distracting, yet researchers do not always implement equally-distracting control conditions.

Similarly, experiments using TMS over S1 to interfere with sensory detection have not typically used signal detection or other measures to rule out response biases. By implementing these controls, we have consistently failed to interfere with the detection of tactile stimuli using TMS over S1, but consistently succeeded in worsening participants' tactile discrimination. I will argue that experimental psychology has been badly neglected in TMS research on touch, yet magnetic stimulation methods remain critical for understanding brain and behaviour.

Attentional bias to itch-related images in clinical itch and healthy skin populations

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Visually-evoked itch (VEI) has previously been demonstrated in both healthy and clinical itch populations, although there are differences in how the effect manifests in the latter group. This study investigated whether these differences are reflected in an attentional bias towards itch images. We tested 31 clinical itch participants (eczema, psoriasis, etc.) and 31 healthy controls, using an arrow probe reaction time task combined with eye-tracking. Participants viewed pairs of itch and non-itch images, then reported the direction of an arrow presented either congruently or incongruently with the itch image. Reaction times were measured, along with the number and duration of saccades towards the itch image. We found an attentional bias in the clinical but not the healthy group; clinical participants responded faster on congruent trials, indicating their attention was directed towards the itch images. Eye-tracking also revealed that they made more saccades towards the itch images and spent longer looking at them. These effects appear to be driven by images featuring skin damage (scratching, rashes etc.) compared to images featuring irritants. Understanding how VEI-provoking images affect healthy and clinical groups differently will help to elucidate how psychological triggers can affect people with itchy skin conditions and perpetuate the itch-scratch cycle.

Perceptual units in Mandarin Chinese

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One of central issues in speech perception is units of spoken word recognition. In alphabetical languages, sound-sized units (phonemes) have traditionally been thought to play a significant role in speech processing – both for perception and production of spoken words [1, 2; although cf. 3,4]. However, the role of sub-syllabic units such as phonemes is unclear for languages with nonalphabetical script – such as Mandarin Chinese [5, 6, 7].

The issue of perceptual units in Mandarin speech perception was investigated via selective adaptation paradigm [8] in a series of three experiments, in which adaptors all started with the same phoneme (e.g. /b/ or /d/) but not syllable; the target was an ambiguous word (e.g. b/dump) that started with a blend of sounds /b/ and /d/. Adaptation effects were found, i.e. more DUMP targets chosen following /b/-adaptors than following /d/-adaptors, that suggest a role for units that are smaller than syllables. The implications of these findings and the origin of the adaptation effects at the phoneme vs. feature levels are discussed.

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Eye movement behaviour during reading: Effects of preceding text difficulty

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Experiments are presented that examine how the difficulty of preceding sentences modulates eye movement behaviour during reading of subsequent unrelated sentences. The difficulty of preceding text was modulated by manipulating the difficulty of filler items. Difficult filler sentences included an object relative clause, nested relative clause, or a syntactic ambiguity. Easy filler sentences included control versions of these filler items. Experimental items included a critical word and the characteristics of the critical word were manipulated. Critical words were either high or low in predictability given the preceding sentence context. Crucially, preceding text difficulty (the difficulty of preceding filler items) modulated first-pass eye movement behaviour for the experimental items, especially the likelihood of refixating words. Preceding text difficulty may also modulate the time course of effects of word predictability. Importantly, the results indicate that the difficulty of preceding text can modulate eye movement behaviour during reading of subsequent unrelated sentences. Implications for models of eye movement behaviour during reading will be discussed.

Preserved syntactic processing in older adulthood: Evidence from eye-tracking during reading

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Previous research has found age differences in the comprehension of temporarily ambiguous sentences, suggesting that older readers may be more likely to engage in 'good enough' processing (Christianson, Williams, Zacks & Ferreira, 2006). An eye-tracking experiment was conducted to further explore the underlying cognitive processes when younger (18-30 years old) and older adults (65 years and above) read temporarily ambiguous sentences (garden path sentences), such as, "While the gentleman was eating the burgers were being reheated in the microwave." Participants were then asked comprehensions questions to assess depth of processing, for example, "Was the gentleman eating the burgers?" Significantly longer reading times at the syntactic disambiguation ("were still") and semantic disambiguation ("being reheated") analysis regions were found for ambiguous sentences compared to unambiguous controls (which contained a comma after "eating"). Interestingly, there was no evidence that older adults were more likely to have difficulty processing temporarily ambiguous sentences compared to their younger

counterparts, suggesting that younger and older adults process temporary syntactic ambiguities in a similar way. Furthermore, older adults were no more susceptible to comprehension errors than younger adults. The results of this study indicate that processing and comprehension of temporary syntactic ambiguities remain intact into later adulthood.

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Error detection in reading: Do older adults use experience of language to their advantage?

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Typically, having greater language experience is beneficial for reading. For older adult readers (aged 65+), extensive prior knowledge of English has been found to widen vocabulary and aid comprehension. Alongside these advantages, research shows there are several age-related changes to reading strategy, which occur as a compensatory response to declining perceptual ability. A wealth of literature points to the adoption of "risky" reading, whereby readers use a combination of previous language experience and sentence context to "guess" forthcoming words in text. Ultimately, by utilising this strategy, older adults are able to cope well with the demands of reading regular text. By contrast, less is known about how prior experience is used when processing errors in text. During our research, results indicated that both younger and older adult readers regularly fail to detect errors in text, despite uncharacteristically careful reading from older readers. Potentially, age-related decline in perceptual ability may force greater reliance on past experience with text, resulting in this error oversight. Accordingly, we examine scenarios in which older adults' prior language experience may hinder error detection. In addition, we examine eye- movement recordings to determine whether reading strategies in older adults may contribute to their performance in error detection tasks.

Comparing real-time social interactions in young and old adults

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Social interactions studies have typically been conducted in a lab-based environment and they mostly focused on childhood and young adulthood. Using a real-world methodology (eye-tracking glasses), we compared social interactions in young (20-40 yo) vs older adults (60-80 yo). In Experiment 1, participants engaged in a short interview-style conversation with the experimenter. In the first speaking part they answered four questions, in the second listening part they switched roles with the experimenter and now asked four questions and listened to the experimenter's answers. Eye-tracking monitored looks to the experimenter's face, body, and background. In

Experiment 2, participants completed a task that required a short walk outside the lab. They were provided with a map that indicated the route to follow, and eye-tracking monitored looks to people, objects, path, and map. Results from Experiment 1 showed that participants spent more time looking at the background while speaking, but longer looking at the experimenter's face features while listening; age did not significantly modulate these patterns. While navigating the real-world in Experiment 2, participants spent surprisingly little time fixating people (~5%), and this was significantly reduced among older adults compared to young adults (3% vs. 7%).

Does looking at the speaker depend on visual or auditory cues?

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Previous research into the way we observe group interactions has investigated the role of speech sound on attention; with findings demonstrating that sound promotes fixations to a speaker. Conclusions were that participants follow the verbalization's to better understand the conversation. This study aims to further examine this conclusion using clips of target discussants to explore how the tendency to fixate on the speaker changes with the auditory and visual information presented. Additionally, this study uses stimuli of a natural group conversation, which surpasses previous research which commonly uses artificial dyad encounters. Experimental clips were either edited to remove the sound, freeze framed or transition to a blank screen. Findings suggest that participants observe silenced and freeze framed clips in a similar way to that of control clips in regards to fixating speaking targets and temporal characteristics. These findings suggest we continue to fixate targets even when no additional visual information can be gained.

Does validity and visual barriers prevent spontaneous perspective taking?

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Recently, it has been suggested that individuals assume the visual perspective of others both 'rapidly' and 'spontaneously'. This has been demonstrated using various paradigms (e.g., gaze cueing; the dot perspective task) in which responses are facilitated when an agent, present in a display, can see the same critical stimulus (i.e., target) as the participant. However, some authors have shown that 'perspective taking' effects occur in these paradigms even when the agent cannot see the critical stimulus because a physical barrier blocks their vision. The present work tested the perspective-taking notion with the use of the ambiguous number procedure, where RTs are longer to identify digits that can be seen as different from an alternative viewpoint (e.g., "68", "89"), together with the barrier technique. We find that the ambiguous number effect still occurs even when the agent cannot see the digit. Therefore, we argue that non-perspective taking processes are driving the ambiguous number effect.

Investigating action prediction in autistic adults

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Predicting the upcoming actions of others involves the activation of one's own motor system to simulate the potential outcome of an action. The perception of others is therefore informed by an individual's motor ability. Motor impairments, such as poor hand-eye coordination and unstable balance are increasingly recognised as a feature of autism. This study investigated whether the ability to predict other people's actions is impaired in autism. 16 autistic and 11 non-autistic adults watched 8 videos (each repeated twice) depicting everyday actions (e.g. preparing a cup of coffee). During each video, action sequences were occluded by a grey square for 1000ms. Following each occlusion, action sequences continued, but were either temporally too late, too early or in time. Participants were required to indicate the temporal congruency of each action by pressing one of three buttons. The accuracy of responses (proportion of correct) and timing biases (proportion of "in time" responses) were measured. Results demonstrated that the autistic group displayed comparable accuracy to the non-autistic group in the ability to predict actions. Future work will test whether autistic adults are using simulation or a different mechanism to successfully predict the actions of others.

Testing motor-sensory predictions in autistic adults

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In this pilot project, we investigated whether coordination difficulties in autistic individuals could be attributed to a deficit in the formation of motor-sensory predictions, involving the conversion of motor commands into predictions of the sensory outcome of the intended movement. Here we combined a motor (finger tapping) task with EEG to provide a direct neural measure of motor-sensory predictive signals in 13 non-autistic and 5 autistic adults. Participants initiated regular finger taps that triggered an immediate presentation of a sound (Auditory-Motor condition, AMC). They also performed an auditory-only condition (AOC) where they simply listened to the auditory stimuli that they had produced. Analysis of EEG data focussed on the N100 component, which is suppressed in the AMC compared to AOC because the auditory cortex is prepared to receive sensory input when a sound is self-initiated (AMC), through the generation of motor-sensory-predictions. Results showed large variability in the timing of the N100 component in both groups. Individual analysis revealed the presence of a later but suppressed N100 component in the autistic participants. The work demonstrates the feasibility of adapting the EEG protocol for autistic adults and that N100 suppression is present but needs to be confirmed in a larger sample.

I know who you are! Social influence on sensitivity to subtle factors, using magicians forcing techniques

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Magicians are true masters of persuasion and have a vast range of techniques allowing them to covertly influence spectators' choices without their awareness. We tested two forcing techniques and evaluated whether social determinability theory (Schadron & Morchain, 2002) could enhance these forcing influences. Social determinability theory suggests that the more a person feels judged in a given social situation, the more suggestible their behavior would be. The first experiment (N=240) used the mental priming force (Brown, 2000), which relies on subtle hand gestures to prime a specific choice of playing card. The second experiment (N=240) used the visual riffle force which has previously been studied and uses time and saliency effects (Olson, Amlani, Raz, & Rensink, 2015; Shalom et al., 2013). For both studies, participants were led to believe the experimenter was able to judge their personality – either by an alleged personality questionnaire or a specific sentence spoken by the experimenter. Our results showed no significant effect of the participants' determinability. However, both forces strongly enhanced the likelihood that the spectator chose the target card, and these results are discussed in regard of the subtle influences contained in the tricks, which remain poorly understood in current psychological research.

Brown, D. (2000). Pure effect: Direct mindreading and magical artistry (3rd ed.) *Humble,TX*: H&R Magic Books.

Olson, J. A., Amlani, A. A., Raz, A., & Rensink, R. A. (2015). Influencing choice without awareness. *Consciousness and Cognition, 37*, 225–236. https://doi.org/10.1016/j.concog.2015.01.004.

Schadron, G., & Morchain, P. (2002). De la jugeabilité sociale à la déterminabilité sociale. *Perspectives Cognitives et Conduites Sociales, (VIII),* 145–161.

Shalom, D. E., de Sousa Serro, M. G., Giaconia, M., Martinez, L. M., Rieznik, A., & Sigman, M. (2013). Choosing in Freedom or Forced to Choose? Introspective Blindness to Psychological Forcing in Stage-Magic. *PLoS ONE, 8*(3). https://doi.org/10.1371/journal.pone.0058254.

Do selfies make you look slimmer?: Investigating weight and aesthetic evaluations of social media style images

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Although the effects of traditional media on body image are well studied, the influence of social media on how we feel about our own and other peoples' bodies is in its infancy (Fardouly & Vartanian, 2016). Research has shown that taking and viewing selfies is linked to body concerns (Cohen et al. 2018) and that viewing angle influences attractiveness ratings of bodies (Carey et al. under review). However, to date little is known about how viewing bodies in selfies influences attractiveness evaluations. Healthy participants each saw bodies from two perspectives: Selfie, allocentric; egocentric; or selfie-stick, and rated them for attractiveness and size. Participants also completed a measure of eating disorder symptomology. Selfies were rated as slimmer compared to the same bodies viewed from other angles. However, images taken using a selfie-stick were considered the most attractive. Whilst hip-to-waist ratio explained some of the differences in attractiveness ratings, level of eating disorder symptoms was also important, particularly for selfies. These results indicate that selfies are judged differently than traditional images, especially by those with high body/eating concerns. Therefore, underlying eating disorder vulnerability may be an important factor mediating the negative effects of using social media, particularly viewing selfies.

Multidimensional body image assessment in young and middle-aged women

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Body image is a multidimensional concept which is important for women throughout the lifespan and body size misperception might be a major contributing factor towards abnormal body image attitude and Eating Disorders (EDs). We assessed women's perceptual size distortions through a novel 2D digital-optical distortion method. Thirty-one Young and 33 Middle-aged healthy women adjusted distorted pictures of their own body (fatter: +50 or slimmer: -50 than real) to match their perceptual (How do you see yourself?), affective (How do you feel yourself?), metacognitive (How do others see you?) and ideal (How would you like to look like?) body image. Attitudinal factors contributing towards body image concerns in older women were also investigated. Both Young and Middle-aged women similarly overestimated their Perceptual, Metacognitive and Felt self-images. Furthermore, older women preferred an ideal slimmer body shape than younger women did. For Middle-aged women, weight phobia and worries related to physical appearance were predictors of size distortion for all subcomponents excluding the ideal body size. For Young women, only BMI was a predictor for all but the ideal subcomponent. Results suggest that body image concerns are consistent throughout the lifetime, regardless of age, yet the factors which influence this, modifies with age.

Alice in Wonderland: The effect of visuomotor synchrony and body size on children's bodily awareness and perception

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As adults, we keep track of our bodies using bottom-up cues such as synchronous touch and movement, which build a sense of 'bodily awareness'. For example, we need to see and feel a body moving at the same time as our own to feel like it belongs to us [1]. Using cues such as this, adults can 'embody' a virtual avatar that is smaller or larger than their own body, altering how they perceive the size of their environment [2]. But what cues to embodiment do children use, when their bodies are constantly changing? Here, for the first time, we compare how 5-year-olds (n=21) and adults (n=22) use movement and body size to build a sense of bodily awareness and perceive the environment. We found that, unlike adults, children felt ownership and control over a body even when it moved asynchronously to their own. This suggests that children are more flexible in their bodily awareness than adults. Both adults and children embodied avatars regardless of their size (though this did not affect size perception), showing that neither age group's bodily awareness is restricted by body size. These findings have important implications in our understanding of the development of bodily awareness.

Peck, T. C., Seinfeld, S., Aglioti, S. M. & Slater, M. Putting yourself in the skin of a black avatar reduces implicit racial bias. *Conscious. Cogn. 22,* 779–787 (2013).

Banakou, D., Groten, R. & Slater, M. Illusory ownership of a virtual child body causes overestimation of object sizes and implicit attitude changes. *Proc. Natl. Acad. Sci. 110*, 12846–12851 (2013).

Maturation of face sensitive abilities as revealed by EEG decoding

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Though performance on face ability tasks is widely reported to improve with age, questions remain regarding the maturation of face-specific processes during childhood. Here, we explored the neural dynamics of face processing in children (6-11 years, N= 76) and adults (N=23) using electroencephalography. Uniquely, we employed multivariate pattern analysis to investigate whether all age groups show similarly distinct neural profiles when viewing upright faces, compared to other objects (houses) or to inverted faces – the latter a hallmark of expert face processing. Results revealed distinct neural activity associated with stimulus categorisation (faces vs houses) and a face-selective orientation effect (upright vs inverted), from the youngest ages tested. Yet we observed clear quantitative differences in the magnitude of this latter effect between children and adults, suggesting that adults may have a more robust neural representation of upright

faces. Standard ERP analysis supported differences in the neural response to face orientation in children compared to adults, while no age related differences were observed between categories. This pattern of results supports an early functional maturation of broad face categorization mechanisms while also providing novel evidence that neural face sensitive specialisation occurs with expertise.

Individual differences in face salience: clues from the unconscious

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Humans are an incredibly gregarious species that rely on large interpersonal social networks. The ability to extract a wealth of information from faces is considered a normal ability in the vast majority of individuals. However, it has become increasingly clear that there are a wide varying range of abilities within the typically developing population. Here, we utilise a particularly powerful variant of binocular rivalry called breaking Continuous Flash Suppression (b-CFS) to investigate perceptual differences in face processing ability (as measured by the Cambridge Face Memory Test) in a series of experiments. In experiment one (n=48), we explored whether unconsciously perceived faces (attractive & unattractive) and houses break into conscious awareness faster in superior face processors. We find that superior face processors receive a greater breakthrough advantage for faces over houses than worse face processors. We also show that only better face processors are sensitive to facial attractiveness. In experiment two (n=42), we repeated our first experiment with an added condition of image orientation on a new cohort of typically developing participants. In addition to replicating our earlier findings, we show that only better face processors are sensitive to the face inversion b-CFS effect.

How does face recognition memory ability relate to motivation to view faces?

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Links between the motivation to engage with social stimuli and processing abilities for such stimuli are widely assumed but rarely directly tested. Here, using a large community sample we explore the association between participants recognition memory for faces and the degree to which they find faces rewarding (measured via a motivated viewing paradigm for faces varying in orientation, emotion and attractiveness). Individuals scoring high on the Cambridge Face Memory Test (top quartile) work to view upright faces for longer than inverted, while those who score poorly (bottom quartile) show the opposite pattern. Correlating this preference for upright faces

(via a difference measure) with face ability suggests a relationship across the entire sample (r2(377)=0.089,p=0.085) driven by the higher performers (above median: r2(180)=0.22,p=0.003). A linear mixed model confirms this relationship (increases in ability correspond to increased viewing of upright faces only) and hints at a mediating effect of emotional expression.

Face recognition ability is manifest in the decoding of face-orientation selectivity from EEG

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There is large and reliable variability in the ability of neurotypical adults to recognise faces. Studies relating neural activity to standardised behavioural measures remain scarce, particularly for time-sensitive approaches. Here we employ Multi-Variate Pattern Analysis to explore the time-course of the neural representation of faces and for the first time directly relate this metric to individuals' broader face processing ability. Twenty participants viewed faces and houses presented upright and inverted, while their on-going neural activity was measured via electroencephalography. These individuals were split into high and low ability groups based on their Cambridge Face Memory Test (CFMT) scores. Significant decoding of face orientation was observed for both groups, with earlier and more accurate decoding in participants with stronger face expertise. This orientation sensitivity of the neural response was face selective, with no such effect observed with houses. We found a significant relationship between CFMT ability and peak decoding accuracy (r=0.67, p=0.001, 95% CI [0.31, 0.86]) and sustainability of decoding (r=0.51, p=0.023, 95% CI [0.08, 0.77]), with an indication of a relationship with decoding onset (r=-0.43, p=0.061, 95% CI [-0.73, 0.02]). No significant relationship between decoding and ability was found for classification of stimulus category (faces vs houses).

The psychometric structure and nomological net of face-matching ability

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Face-matching requires comparison of faces unknown to a viewer aiming to decide whether they depict the same person or not. Individuals, including professionals such as passport officers and forensic facial examiners, differ broadly in their ability to match unfamiliar faces. Additionally, individuals vary in performance depending on which face-matching test they work on. However, the structure of variability in face-matching depending on stimulus and task characteristics is still largely unexplored. In the present study we aimed to fill this gap and asked

1) whether factors such as face age, sex and race, as well as facial paraphernalia affect the covariance structure of face-matching performance. 2) To understand the variability across face-matching tasks, we asked whether specific face-matching factors differentially relate to hitherto published face-matching tests. 3) We studied the nomological net of face- matching ability and estimated latent level associations with face and object perception, as well as face memory. In a fairly large sample of N = 302 young adults we found that above general face-matching ability, individuals systematically differ in their ability to match faces of different race and such with paraphernalia. Stimulus age related differences are less robust. We will discuss the construct validity of face-matching.

No clear advantage for high variability training during voice identity learning

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High-variability training has been shown to benefit the learning of new face identities: high-variability exposure is thought to enable viewers to detect stable, reliable features, while discounting transient, unreliable features. In two experiments, we investigated whether high-variability training also aids voice identity learning. In Experiment 1, we contrasted high-variability training sets - including stimuli extracted from a number of different recording sessions, speaking environments and speaking styles - with low variability stimulus sets extracted from one recording of read speech (i.e. one speaking style/context). In Experiment 2, we contrasted the same high-variability training sets as Experiment 1 with new low variability training sets containing the same range of speaking style/contexts but including repetitions of a smaller number of unique exemplars. For both studies, listeners were trained on 4 voice identities (2 through high-variability training, 2 through low-variability training) and subsequently tested on an old/new recognition task using read sentences. We found no high-variability training advantage in Experiment 1 – instead we found a disadvantage. In Experiment 2, we found a small advantage for high-variability training, an effect that can be explained by stimulus-specific effects. We discuss these findings in the context of the mechanisms thought to underpin advantages for high-variability training.

Do click trains dilate time perception due to physiological arousal?

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Presentation of auditory click trains leads to increased estimates of subsequently presented stimulus durations. This is thought to be due to an increase in internal clock speed, perhaps triggered by physiological arousal. Work with emotional stimuli suggests similar temporal

dilations, and there is mixed evidence suggesting this may be due to increased arousal. We therefore aimed to test the assertion that click trains increase estimates due to physiological arousal. We compared estimates of tone durations following negative sounds, neutral sounds, click trains and silence, while recording pupil size and heart rate a measures of arousal. Contrary to expectations, estimates did not differ following any of the stimulation types. However, pupil size change was significantly higher during negative and neutral sounds than both click trains and silence, and during click trains than silence. Heart rate change was higher during negative sounds than click trains. Finally, while pupil size change did not correlate with estimates, heart rate change correlated with estimates during neutral sounds and click trains (significantly), and negative sounds and silence (moderate and anecdotal Bayes factors). We therefore found correlations between estimates and arousal during click trains, and we provide procedural suggestions for future investigations of this relationship.

Distracter familiarity produces auditory distraction through attentional diversion in short-term memory

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Short-term memory is disrupted by the presence of task-irrelevant sound, but the mechanisms underpinning auditory distraction are contested. On the duplex-mechanism account (Hughes, 2014), disruption occurs due to interference-by-process—whereby pre-attentive order-encoding of auditory changes clash with serial-order cues relating to visual-verbal items—or attentional diversion, whereby sound diverts attention away from the focal task. Interference-by-process thus occurs only when serial-order is required for the focal task (Hughes, 2014). Attentional diversion, however, occurs regardless of whether the focal task requires serial-order. This study explored the propensity for familiar auditory sequences to produce greater disruption of short-term memory than unfamiliar sequences. In Experiment 1, participants performed a visual-verbal serial short-term memory task in the presence of familiar or unfamiliar auditory sequences comprising instrumental melody, song or speech. Performance was disrupted more by familiar distracters only when the sequence comprised an instrumental melody. Experiment 2 sought to determine whether familiar against unfamiliar melodies were more disruptive due to interference-by-process, or attentional diversion, by comparing the two in the context of a non-serial short-term memory task. Performance on the missing-item task was more greatly impaired by the presence of familiar than unfamiliar melodies. We conclude that such distracter-familiarity effects are attentional diversion effects.

Hughes, R. W. (2014). Auditory distraction: A duplex-mechanism account. *PsyCh Journal, 3*(1), 30-41. doi: 10.1002/pchj.44.

Masked conceptual priming of recognition memory for homonyms: Conceptual fluency vs. semantic elaboration effects

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Familiarity and recollection judgements can be influenced through masked priming during the test phase of a recognition memory paradigm. Repetition priming increases familiarity hits and false alarms (Rajaram & Geraci, 2000; Taylor & Henson, 2012, whereas conceptual priming increases correct recollection only (Taylor & Henson, 2012; Taylor et al., 2013). The present study aimed to investigate the mechanism of conceptual priming effects. Critical stimuli were homonyms, and the encoded meaning was biased by pairing each homonym with another word in the study phase. In the test phase, homonyms were preceded by three types of masked primes: related to the encoded meaning, related to the alternative meaning, or unrelated, and participants (N = 32) made an old/new judgement and then a familiar/remember judgement. We predicted that primes related to the encoded meaning only would increase the proportion of recollection responses compared to unrelated primes. Results showed that primes related to the encoded meaning increased recollection responses compared to primes related to the alternative meaning, whereas the reverse was observed for familiarity responses. This pattern of results suggests that conceptual priming influences familiarity and recollection through distinct mechanisms: Generic conceptual fluency increases familiarity, whereas encoding-matching semantic elaboration facilitates recollection.

Rajaram, S., & Geraci, L. (2000). Conceptual fluency selectively influences knowing. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 26*(4), pp. 1070-1074. DOI: 10.1037/0278-7393.26.4.1070.

Taylor, J. R., & Henson, R. N. (2012). Could masked conceptual primes increase recollection? The subtleties of measuring recollection and familiarity in recognition memory. *Neuropsychologia, 50*(13), 3027-3040.

Taylor, J. R., Buratto, L. G., & Henson, R. N. (2013). Behavioral and neural evidence for masked conceptual priming of recollection. *Cortex, 49*(6), pp. 1511–1525. DOI: 10.1016/j.cortex.2012.08.008.

Inconsistent ink colours decrease recognition and recall accuracy during paired-associate learning

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The current research examined how task-irrelevant information affects performance in a paired-associate learning task. Hazan-Liran and Miller (2017) developed a learning task by combining the Stroop task and the digit-coding task. Colour-word/number pairs were displayed on a piece of paper. A list of colour words was provided with the aim to write down the number cued by the

word as quickly as possible. Two minutes were given to complete the task. The researchers manipulated the ink colours of numbers presented in consistent, inconsistent, or black ink. Performance was worst in the inconsistent condition. The aim of the present studies was to replicate and extend their findings but using recognition and cued-recall tests. In our studies, participants learned eight colour-word/number pairs. The colour of the printed numbers was irrelevant to the task but could be consistent or inconsistent to the colour word. Words studied were colour names (e.g., green; Experiment 1, 3, 4) or colour-related words (e.g., sky; Experiment 2, 3, 5) on a recognition test (Experiment 1, 2) or a cued-recall test (Experiment 3–5). The results revealed that colour names in the inconsistent condition interfered with learning. The results could be explained by a cognitive load or inhibitory processes.

Hazan-Liran, B., & Miller, P. (2017). Stroop-like effects in a new-code learning task: A cognitive load theory perspective. *Quarterly Journal of Experimental Psychology, 70*(9), 1878-1891. doi:10.1080/17470218.2016.1214845.

Emotional Stroop effect in high anxiety is a result of task conflict

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Previous research attempted to account for the emotional Stroop effect based on single-stage connectionist models thus implicating response conflict as the underlying mechanism (e.g. Williams et al., 1996). Based on Kalanthroff et al.'s (2015) multi-stage proactive-control/task-conflict (PC-TC) model our study argues that the emotional Stroop effect is due to task conflict. We adapt a study-test procedure from Sharma (2018) to investigate the effects of studied negative words and neutral control words, in 120 native English speakers divided into the high (N = 59) and low (N = 61) trait anxiety groups. The results for the low anxious group show no emotional Stroop effect but do demonstrate the slowdown in response latencies to studied words that is indicative of proactive control. In contrast the high anxious group show an emotional Stroop effect but only for studied negative words indicating a hypervigilance to recently seen negative stimuli. Further trial by trial analysis of this effect showed a sequential modulation in which studied negative words slowed down the colour-responding of studied negative words on the next trial. This is consistent with negative stimuli driving attention that is based on task conflict.

Kalanthroff, E., Avnit, A., Henik, A., Davelaar, E. J., & Usher, M. (2015). Stroop proactive control and task conflict are modulated by concurrent working memory load. *Psychonomic Bulletin & Review, 22*, 869 – 875. http://dx.doi.org/10.3758/s13423-014-0735-x.

Sharma, D. (2018). Priming can affect naming colours using the study-test procedure: Revealing the role of task conflict. *Acta Psychologica, 189*, 19-25. https://doi.org/10.1016/j.actpsy.2016.11.004.

Williams, J. M. G., Mathews, A., & MacLeod, C. (1996). The emotional stroop task and

psychopathology. *Psychological Bulletin, 120*, 3-24.

Continuous force measurement provides new insights on the effects of healthy ageing on inhibitory control

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Inhibitory control is a cognitive process involving the restraint of automatic or impulsive responses in favour of goal-oriented behaviour. While deficits in inhibitory control are associated with typical cognitive decline in older adults (Hasher & Zacks, 1988), there is no agreement on how aging affects different types of inhibitory control. Here we investigated how healthy aging affects conflict resolution and action cancellation using the Simon and Stop Signal task (SST), respectively. For the Simon task, older participants (68.91 ±5.75 years) showed a significantly larger Simon effect than the younger participants (20.52 ±1.81 years), which is consistent with the age-related decline in inhibitory control. No significant group differences were found on SST performance. Apart from the button press measures, we also recorded continuous response force, simultaneously and independently in both hands, to capture sub-threshold partial responses that would otherwise go undetected. Younger participants made significantly more partial errors than older participants on the SST, but we found no reliable group differences in partial responses in the Simon task. These findings are discussed in terms of their implications for understanding the effects of healthy aging on inhibitory control, and the potential application of response force measurement to studying response activation and inhibition.

Hasher, L., & Zacks, R. T. (1988). Working memory, comprehension, and aging: A review and a new view. In G. H. Bower (Ed.), *The Psychology of Learning and Motivation, Vol. 22* (pp. 193-225). New York: Academic Press.

Sensitivity to framing effects and insight problem solving

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Decision makers faced with identical options systematically prefer some over others, e.g. when an outcome is framed positively, people prefer a definite result, when framed negatively, they prefer a probabilistic one (Tversky & Kahneman, 1981). Kahneman (2003) described framing effects as unquestioning acceptance of a given formulation, which applies to puzzles as well. Insight problems may be an example, as they tend to evoke misleading mental representations. We might therefore expect those prone to framing effects to have more difficulty with insight problems. Conversely, frame sensitivity may reflect a cognitive flexibility which facilitates representational change, resulting in better insight performance.

To test the direction of relationship between frame sensitivity and insight, 60 participants

attempted six insight problems and twelve framing problems, 6 initially, and later, the 6 framing problems in parallel forms but in the reverse frame. Frame sensitivity was measured as the total number of changes to initial decisions under the alternate frame.

Insight solutions ranged from 0 to 6 with mean = 3.00. Frame sensitivity scores ranged from 1 to 5, with mean= 3.15. R= 0.32 (p =0.01).

Results indicated insight performance and frame sensitivity were positively related. Research is underway to replicate and extend the finding.

Kahneman, D. (2003). A perspective on Judgment and choice. *American Psychologist, 58*, 697-720.

Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science, 211*, 453–458.

Notes

Notes

Travelling to Manchester

The conference will take place in the Samuel Alexander Building (number 67 on the campus map on the back page of this programme) which is accessible on foot from Lime Grove. The venue is close to the Oxford Road in the South Campus.

For information on directions and maps, you can also visit the University of Manchester website: https://www.manchester.ac.uk/discover/maps/.

By road

All approach routes for cars travelling here are clearly signposted for University of Manchester. Please see the website above for directions from your area.
Car parking facilities are available on campus and this information can also be found on the website.

By rail

It's easy to travel by train to the University of Manchester due to the proximity of three large rail stations.

Located close to both Piccadilly main line station (about two and a half hours from London) and Oxford Road train station, with Victoria train station a little further away.

-      From Oxford Road train station it is a 15-20 minute walk or a 5 minute bus ride. You can take most buses running South along Oxford road (42B, 111, 142, 143, 197). The second University bus stop (outside the Stopford Building) is the closest to the Samuel Alexander Building.
-      From Piccadilly Railway station, it is a 20-25 minute walk or you can take the 147 bus from outside the train station or there is a taxi rank.

For details of timetables, tickets and other rail information, please visit:
http://www.nationalrail.co.uk/

By coach and bus

There are various ways to travel to the University of Manchester by coach, bus or tram.

National Express coaches serve over 1,200 destinations across the UK from the Chorlton Street Coach Station, which is near Piccadilly railway station and a short walk from both University campuses.

For more details: https://www.manchester.ac.uk/discover/maps/travel-by-bus-coach/

By air

If you plan to travel by air to the University of Manchester, the nearest airport is Manchester Airport.

Manchester Airport is one of the largest and busiest in the country. It is located about 10 miles (16km) south of the city centre, about 30 minutes from the University.
The airport has a number of transport links to the city:

- **Train** – The airport's two terminals are linked directly to the city centre by a fast, frequent 24-hour train link to both Piccadilly and Oxford Road stations.
- **Taxi** – A taxi from the airport to the University will cost approximately £20.
- **Bus** – Local buses also run to the Oxford Road and Sackville Street areas of the campus.

Most major airlines fly to and from Manchester.

Places to stay near the meeting

There are many accommodation options in Manchester to suit all budgets. Below are some suggestions for different price ranges:

High-end:
The Midland Hotel: https://www.themidlandhotel.co.uk

Mid-range:
Holiday Inn Express Manchester Oxford Road: http://www.hiemanchester.co.uk/
Premier Inn Manchester City Centre: 112-114 Portland Street, Manchester, Manchester M1 4WB

Budget:
Hatters Hostels: http://www.hattershostels.com
Aparthotel:
Roomzzz: http://www.roomzzz.com/manchester-city/

Cafés on Campus

- Café at the Learning Commons (directly opposite venue, number 63 on the map) – sandwiches, jacket potatoes, soups and drinks
- Lime Café (same building as conference, opposite side) - sandwiches, jacket potatoes, soups and drinks
- Vasio – (number 59 on the map) – large university café with wide selection of hot foods
- Christie's Bistro – café and restaurant based in the old science library (number 58 on the map): http://www.chancellorscollection.co.uk/christies-bistro/
- Green House (number 93 on the map) - freshly made vegetarian and vegan food with coffee from Ancoats Coffee (best coffee on campus!)

Bars and Cafés off Campus

- Kro Bar – Bar with pub menu with Danish specialities, 325 Oxford Rd, Manchester M13 9PG: www.kro.co.uk
- Sand Bar – Pub with excellent selection of beers which serves hand-made pizza (also a good evening venue), 120 Grosvenor Street, Manchester, M1 7HL: http://sandbarmanchester.co.uk/
- Hatch – pop up street food: https://hatchmcr.com/ (also features Takk Espresso – excellent coffee)
- 8th Day – vegetarian café and good value (the dahl is highly recommended), 111 Oxford Rd, Manchester M1 7DU: http://www.8thday.coop/
- Café in the Trees (84 on map) – seasonal and locally sourced menu, beautiful venue, Whitworth Art Gallery, Oxford Road: http://www.whitworth.manchester.ac.uk/visit/foodanddrink/

Restaurants

There are a huge number of restaurants in Manchester once you venture into the city centre – something for everyone. Here are a few recommendations:

- Red Chilli, Chinese – located both by the University and in the city centre: https://redchillirestaurant.co.uk/
- Beastro, modern british food: https://www.beastromcr.co.uk/
- Don Giovani, independently owned Italian restaurant: http://dongiovanni.uk.com/
- Rudy's, modern pizza venue (2 branches in Manchester): https://www.rudyspizza.co.uk/
- Albert Square Chop House, bar and restaurant in a listed building which serve a British menu: https://albertsquarechophouse.com/
- Albert's Schloss – Bavarian-inspired dishes: https://www.albertsschloss.co.uk/cookhaus/
- Indian Tiffin Rooms, serves Indian street food: https://www.indiantiffinroom.com/restaurants/manchester/
- 1847, modern vegetarian restaurant: https://1847manchester.com/
- Allotment, fancy vegan and gluten free restaurant (excellent vegan cheese board): https://allotmentvegan.co.uk/
- Samsi, Japanese food: https://www.samsi.co.uk
- Habesha, informal Ethiopian café, good value: http://habesharestaurant.co.uk/

    The **Northern Quarter:** http://northernquartermanchester.com/ is a lively area to visit in the evening with bars and restaurants. A couple of recommendations are:
- Dough Pizza: http://doughpizzakitchen.co.uk/
- Penang Manchester – Malaysian food: https://penang-manchester.business.site/

Things to do in Manchester

Both the Manchester Museum (44 on map): http://www.museum.manchester.ac.uk/ and Whitworth Art Gallery (84 on map) are based on campus (and free entry): http://www.whitworth.manchester.ac.uk/
Manchester Art Gallery: http://manchesterartgallery.org/
Museum of Science and Industry https://www.scienceandindustrymuseum.org.uk/
John Rylands Library – part of the University but based in the city centre – impressive neogothic Victorian building https://www.library.manchester.ac.uk/rylands/

EPS Conference Dinner

The conference dinner will be held on Thursday 11th April at 8:00pm at Zouk, (https://zoukteabar.co.uk/) Unit 5, Chester Street, Manchester, M1 5QS. This is in the city centre and approximately a 15 minute walk from where the meeting is being held. Your meal must be booked by 15th March.

The dinner cost will be £24.00. Postgraduates can attend at a reduced price of £12.00 and need to request their supervisor to email the local organisers, Andrew Stewart or Ellen Poliakoff to confirm their status as postgraduate students.

There are three set menu options available:
- Menu A is the set banquet which will be served to the table banquet-style and will include Tandoori Mixed grill, Punjabi Lollipop, Lamb Laziz, Butter Chicken, and Chicken Kabhani.
- Menu B is the vegetarian option served on an individual platter and will include Samosa Chaat, Paneer Tikka, Chilli paneer, Tarka Dall, and Mili Juli Sabzi.
- Menu C is the vegan option, also served on an individual platter, and will include Falafel, Masala Mirch, Bindi, Palak Aloo, and Mili Juli Sabzi.

Rice and naan will accompany all menu options.
Desserts will also be served.

If you are a student, please ensure you select the menu option with (postgraduate) in brackets to receive a 50% discount. This can be done once your supervisor has emailed the local organiser to confirm your status.

The meal should be booked via this link:
https://estore.manchester.ac.uk/conferences-and-events/division-of-neuroscience-and-experimental-psychology/experimental-psychology-society-meeting/experimental-psychology-society-meeting-april-2019

Dinner bookings must be made by 15 March and late bookings cannot be accepted. If you have any special dietary requirements you should indicate what these are at the time of your booking.

If you have any queries about the dinner, please contact the local organisers:

Andrew Stewart (andrew.j.stewart@manchester.ac.uk) or

Ellen Poliakoff (ellen.poliakoff@manchester.ac.uk)
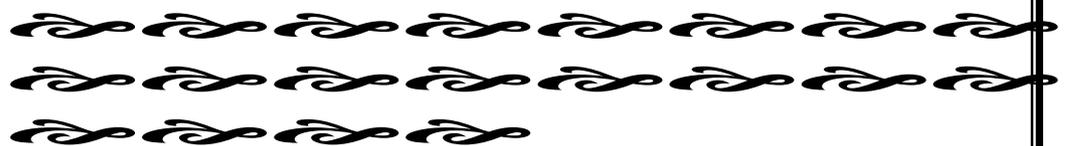
The Twenty-Sixth EPS Prize Lecture

will be delivered by

Dr Richard Cook

Birkbeck University of London

What kind of deficit causes developmental prosopagnosia?

6.00pm, Thursday 11th April 2019

Samuel Alexander
Lecture Theatre

University of Manchester

The lecture will be open to the public

APPLYING TO JOIN THE
EXPERIMENTAL PSYCHOLOGY SOCIETY

To apply for membership to the Experimental Psychology Society please go to the EPS website: https://eps.ac.uk/applying-for-membership/ and fill in the form, ensuring all boxes are completed (Entries should be made in clear black type) before signing and returning to the EPS Administrator: expsychsoc@kent.ac.uk or sending to:

Samuel 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 single or first author, are sufficient.

Applicants must be nominated by two EPS members.

These forms should be returned by 1st September to the EPS administrator by email: expsychsoc@kent.ac.uk or by post to Samuel Hurn, School of Psychology, Keynes College, University of Kent, Canterbury, CT2 7NP.

See Criteria and Procedures on following page

CRITERIA AND PROCEDURES TO JOIN

EXPERIMENTAL PSYCHOLOGY SOCIETY

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 Autumn meeting. The Committee will decide whether each candidate is eligible for admission to Ordinary Membership, i.e. those candidates who have:

a)   secured a PhD

b)   published at least 2 independent accounts of their work in reputable, peer-reviewed psychological journals, and

c)   personally delivered an oral paper 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 Committee 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 for approval.

April meeting, 10th – 12th April 2019

The programme for the April meeting is enclosed with this mailing.

Conference dinner:
The conference dinner will be held on Thursday 11th April at 8:00pm at Zouk, (https://zoukteabar.co.uk/) Unit 5, Chester Street, Manchester, M1 5QS. This is in the city centre and approximately a 15 minute walk from where the meeting is being held. You must book your meal and make your payment by 15th March.

Please use the following link to book your place at the Conference Dinner:
https://estore.manchester.ac.uk/conferences-and-events/division-of-neuroscience-and-experimental-psychology/experimental-psychology-society-meeting/experimental-psychology-society-meeting-april-2019

The programme also includes:

Twenty Sixth EPS Prize Lecture
Thursday 11 April, 6:00pm

What kind of deficit causes developmental prosopagnosia?
Dr Richard Cook, Birkbeck University of London

Accompanying symposium
Thursday 11 April, 1:30pm

Individual differences in face processing
Organiser: Katie Gray, University of Reading

Eighth Frith Prize Lecture
Wednesday 10 April, 5:00pm

The neurocognitive basis of episodic memory in autism
Dr Rose Cooper, Boston College, USA

Joint EPS / BSA Undergraduate Project Prize winner talk
Thursday 11 April, 5:00pm

Computational mechanisms underlying flexible decision-making via instant decomposition
Jacob Lagerros, University of Oxford

Local organiser symposium
Thursday 11 April, 9:00am

Characterising motor imagery
Organisers: Andrew Stewart and Ellen Poliakoff

Bournemouth University, 10th – 12th July 2019

The portals for submissions to this meeting will open on the website week commencing 15th April 2019.

The meeting will include:

47th Frederic Bartlett Prize Lecture by with the title:
The psychology of experimental psychologists: Overcoming bias and irrationality to improve research
Professor Dorothy Bishop (University of Oxford)

Joint EPS/BSA Undergraduate Project Prize winner talk:
Detachment from external influence: A computational model of free action selection
Gwydion Williams (University College London)

Symposium to accompany the 47th Frederic Bartlett lecture:
The dangers of attributing "bias" based on intuition
Organiser: David Shanks (University College London)

Local organisers' symposium:
Current trends in identity and emotion processing in faces
Organiser: Peter Hills (Bournemouth University)

The local organiser is Peter Hills

A copy of the EPS Handbook 2019 is included in this mailing for members

Professor Heather Ferguson
Hon Secretary

EPS
Experimental
Psychology
Society

EXPERIMENTALPSYCHOLOGYSOCIETY

The Business meeting will be held at 5:30pm on Thursday 11th April, 2019 in **Samuel Alexander Lecture Theatre**, University of Manchester, Lime Grove, Manchester, M13 9PP.

AGENDA

19/09	Minutes of the 71st Annual General Meeting held at University College London, 26 Bedford Way on Thursday 3rd January 2019
19/10	Matters arising
19/11	Secretary's Report
19/12	Treasurer's Report
19/13	QJEP Editor's Report
19/14	Arrangements for future meetings
19/15	Any Other Business

Date, time and place of next meeting

Annual General Meeting

The Annual General Meeting was held on Wednesday 3rd January 2019 in Room 311, University College London, 26 Bedford Way, London, WC1H 0AP.
There were over 40 members in attendance.

19/01 Minutes
Minutes of the business meeting held in July 2018 were approved as no issues raised.

19/02 Matters Arising
No matters arising.

19/03 Hon Secretary's Report

3.1 Annual Report of the Society (to be circulated)

The outgoing Hon Sec described some successful EPS projects in the past twelve months. This included bringing the operation of the EPS website in-house. The AGM agreed that EPS email newsletters contain only material that is directly relevant to the Society activities and members' research, whilst the twitter account holders undertake to consider re-tweeting material about non-EPS events / initiatives. Priority will be given to requests from EPS members and activities of clear relevance to the Society. The News section on the website – which also carries the twitter feed - will consider including material in the same vein with the same constraints applying.

The Hon Sec. also reflected on the successful meetings of 2018 in London, Leicester and Newfoundland, Canada.

The Hon Sec. outlined a proposal under discussion by the committee for the introduction of either a prize model or pre-registration grant process for authors who submit articles for QJEP using the registered report route. This potentially would provide funding for work that received an In Principle Acceptance for planned work. The Hon Sec noted this plan would potentially involve the devolving of award choices beyond the committee (ie to a journal editor, based on peer review etc). The Hon Sec confirmed the committee anticipated capping this scheme (for total award and per member awards). It was suggested by a member that junior members of the Society should be consulted as it is they who are most likely to have funding pressures and concerns about the investment required of such a process. It was agreed that the committee will look into these proposals with the suggestions of the members on board.

19/04 Hon Treasurer's Report

4.1 Treasurer's Report (summary accounts to be circulated)

Accounts are stable and similar from 2015/2016, as 2016/2017 included £100,000 Golden Hello from Sage, skewing figures but taken into account means stability in last three years. In 2017/2018, there was a slight deficit overall but reserves are healthy. Number of Grindley Grants issued has reduced significantly as applicants are now required to travel to an EPS meeting first, before they can apply for travel to non-EPS meetings.

The Treasurer asked that when members submit a claim they should specify the VAT amount as this is vital in helping save money and claim up to 20% of tax back if applicable.

M&G Charifunds investments have now been started on a standing order to increase by £5,000/month, totalling £60,000/year in equity holdings. This adds to existing holdings in this scheme.

19/05 QJEP Editor's Report

5.1 Editor's Report

The editor made his report to the AGM, stating that overall, the Journal is healthy, though a slight reduction in submissions from around 450 in 2017 to 426 in 2018. This drop is most likely caused by rival, Journal of Cognition, being back in operation. There is also a slight increase in the QJEP rejection rate, but SAGE says this is good for the Journal.

Impact factor of QJEP is stable (actually a slight but not very meaningful increase) and still reflects performance under Marc Brysbaert's reign as Editor. The relationship with SAGE is excellent, following the new 7-year contract started in 2017. Social Media and website now back in EPS control is a positive, with new Talking Heads videos being especially successful.

5.2 Plan S (https://www.coalition-s.org/)

Plan S is moving forward rapidly and will have implications for QJEP no matter what actions taken. Internationally, some US foundations (including the Gates Foundation) are positive about Plan S, but in China there was initial support which seems to have cooled, but this will need to be monitored further.

As currently QJEP is a hybrid model, it would not be Plan S compliant to allow funded authors to publish. Therefore, the editor has looked into possible permutations, but it is very hard to model impacts exactly. Three options were presented to the meeting:

1. Stay as a hybrid and not be Plan S compliant
2. Become open access, which would be compliant but would require charging for each article
3. Develop a new open access journal, independent of QJEP, that would be Plan S complaint

Option 3 is least risky and would cover the society's options since in the long term either Journal format could be dropped if it became non-viable, whilst maintaining options for authors

Celia opened discussion to the meeting.

- New journal must have its own independent editor and editorial team
- New journal would need different content to QJEP
- Would APCs be able to be paid for by researchers?
o Importantly, plan S has not set the cap yet may be anything which affects modelling its impact
- Culture of the Society may be affected as members if members are excluded from publishing in QJEP by costs
- Currently no idea of how other journals will react
- How the new second journal would work would need to be planned out
o New editor would first need to be recruited to help establish new journal
- Concerns of diluting both journals
o OA format may prevent good scientific work from being published for financial reasons
o Other journals may have increased APCs due to low submissions but this isn't known for sure
o UKRI are running consultation with first phase completed, There is possibility to provide some feedback to UKRI and British Academy

Celia recommended to the membership that the committee actively explore the possibility of a new journal, without commitment as the area is still volatile, which was agreed by the meeting.

19/06 Future Meetings

April 2019, University of Manchester   LOs Andrew Stewart & Ellen Poliakoff

July 2019, Bournemouth University   Local organiser Peter Hills

19/07 Any Other Business

Approximately 40 members with lapsed memberships will lose their subscriptions. The EPS has repeatedly tried to contact them before taking this step.

All awards and nominations for committee members were approved by way of applause.

The meeting expressed considerable thanks to James Bisby as local organiser for this meeting.

19/08 Date, time and place of next meeting

Next business meeting will be at the University of Manchester, April 2019 - Details to be circulated.

City Centre

Conference Dinner
(Zouk, Chester Street)

Conference Venue
(Samuel Alexander Building)